Total vegetation cover soil protection Region:NRM Mackay Whitsunday QLD

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

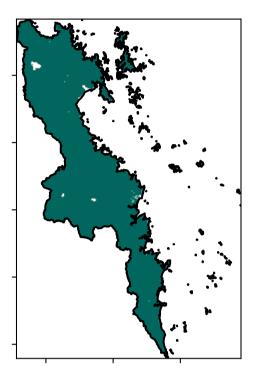


Vegetation Cover Jun 2012

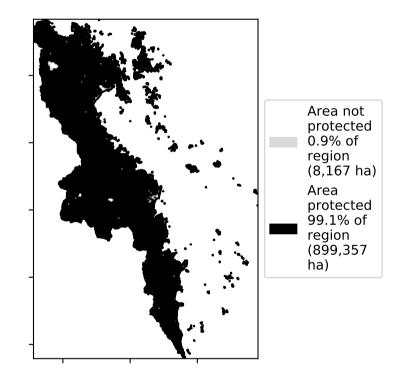
Land use and forest cover

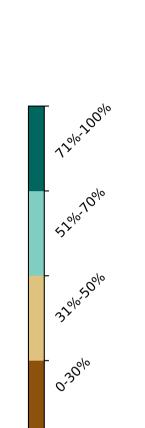
Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments -Non-forest 2 Conservation and natural environments -Woodland forest 3 Conservation and natural environments -Non-Woodland forest 4 Agriculture - Grazing - Non-forest 5 Agriculture - Grazing - Woodland forest 6 Agriculture - Grazing - Non-woodland forest 7 Agriculture - Grazing - Irrigated 8 Agriculture - Cropping - Non-irrigated 9 Agriculture - Cropping - Irrigated 10 Agriculture - Horticulture - Non-irrigated 11 Agriculture - Horticulture - Irrigated 12 Production native forests and plantation forests 13 Other uses

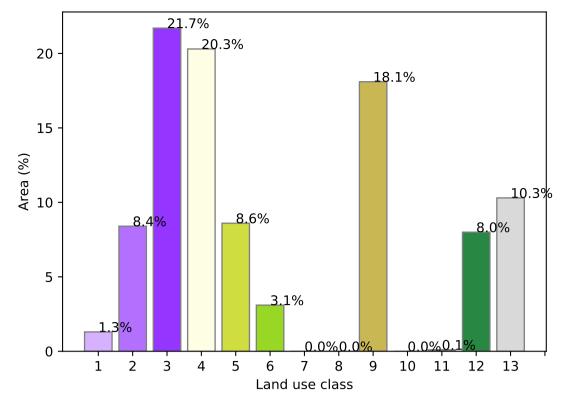
Total Vegetation Cover [%]



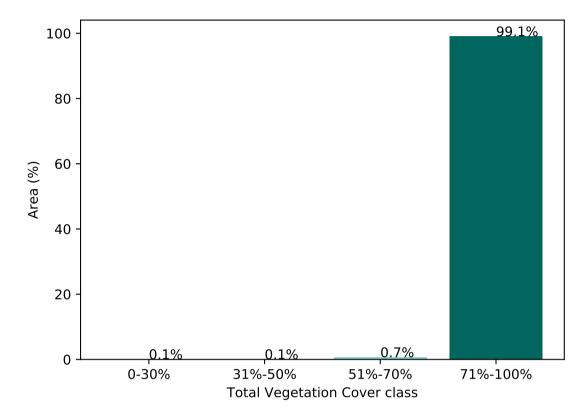
% Area protected from water erosion (>70%)



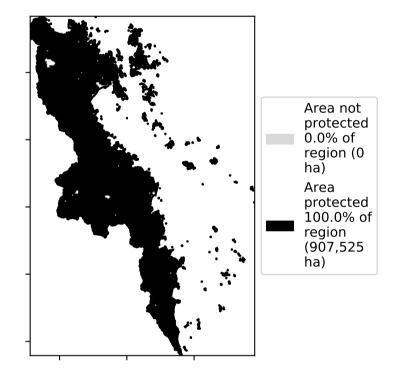




Proportion of vegetation cover class in area



% 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

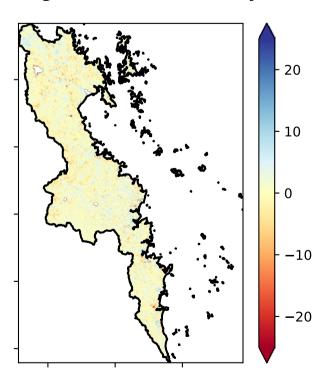
of Australia (2018)

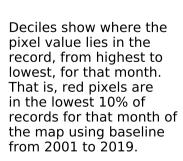
Derived from

Use of Australia

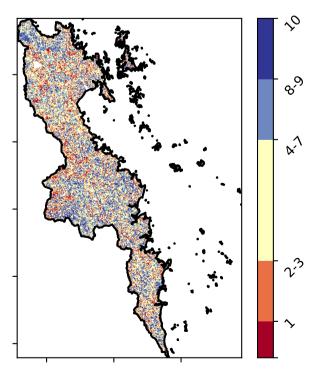
Land Use and Forests

Catchment Scale Land

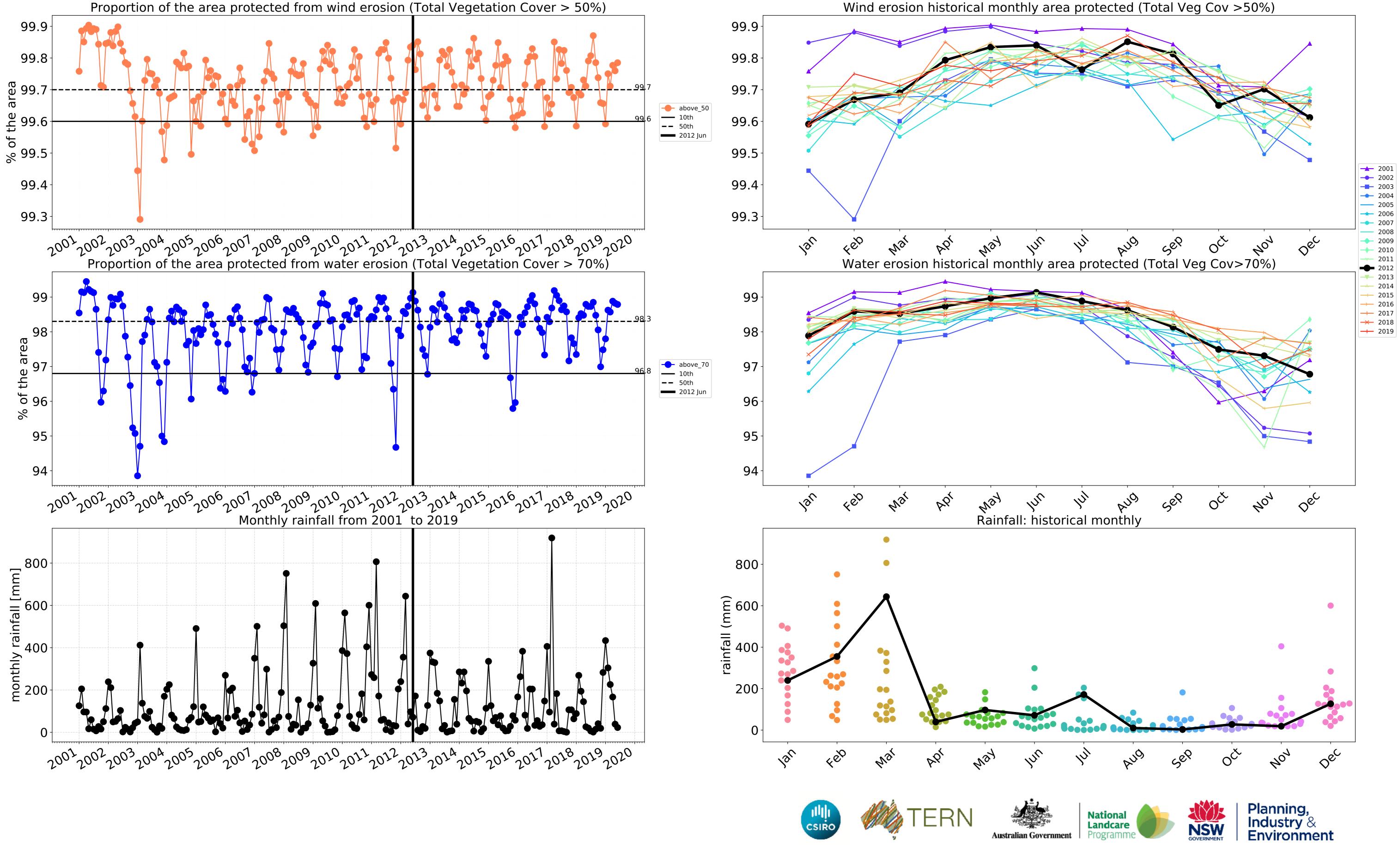


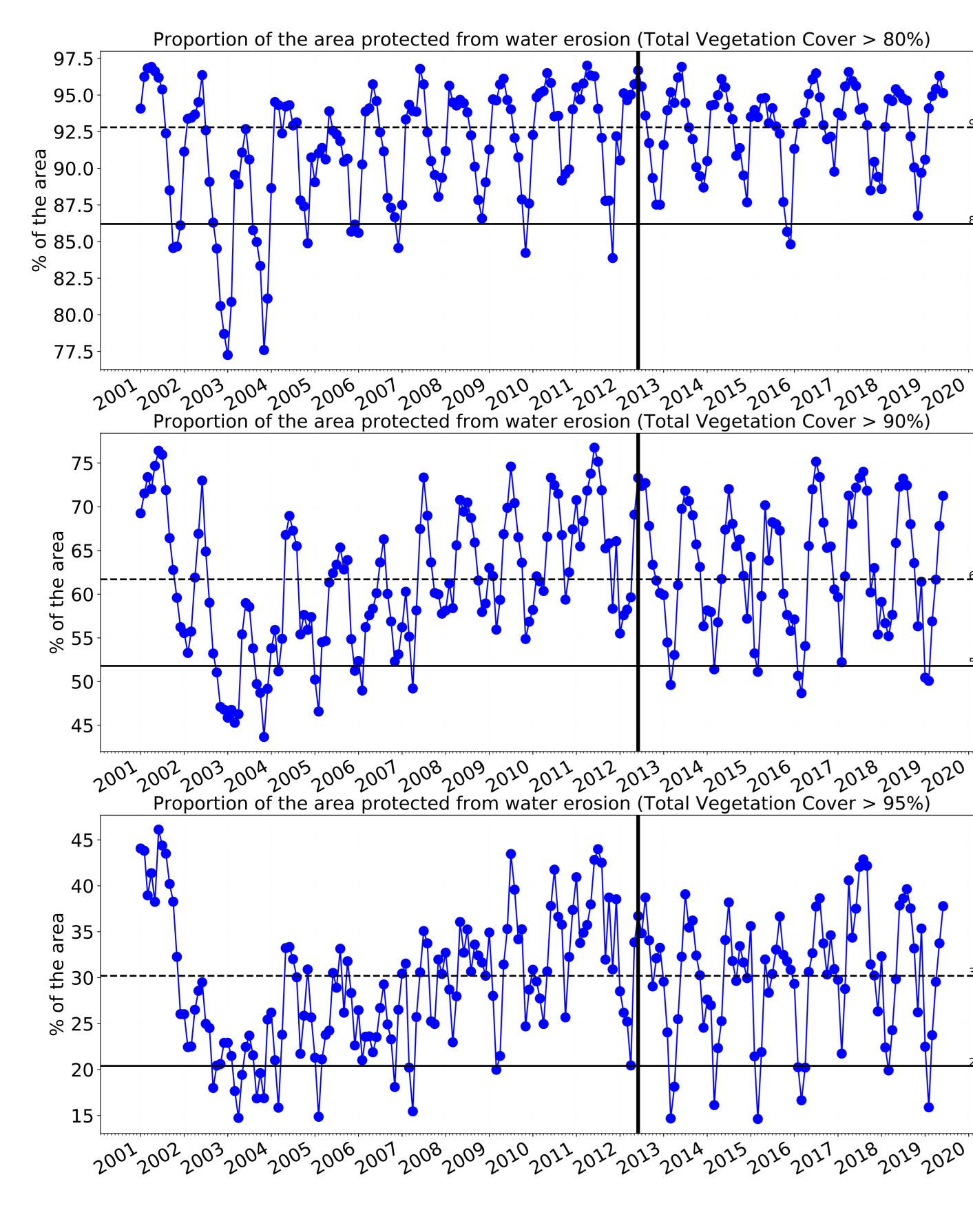


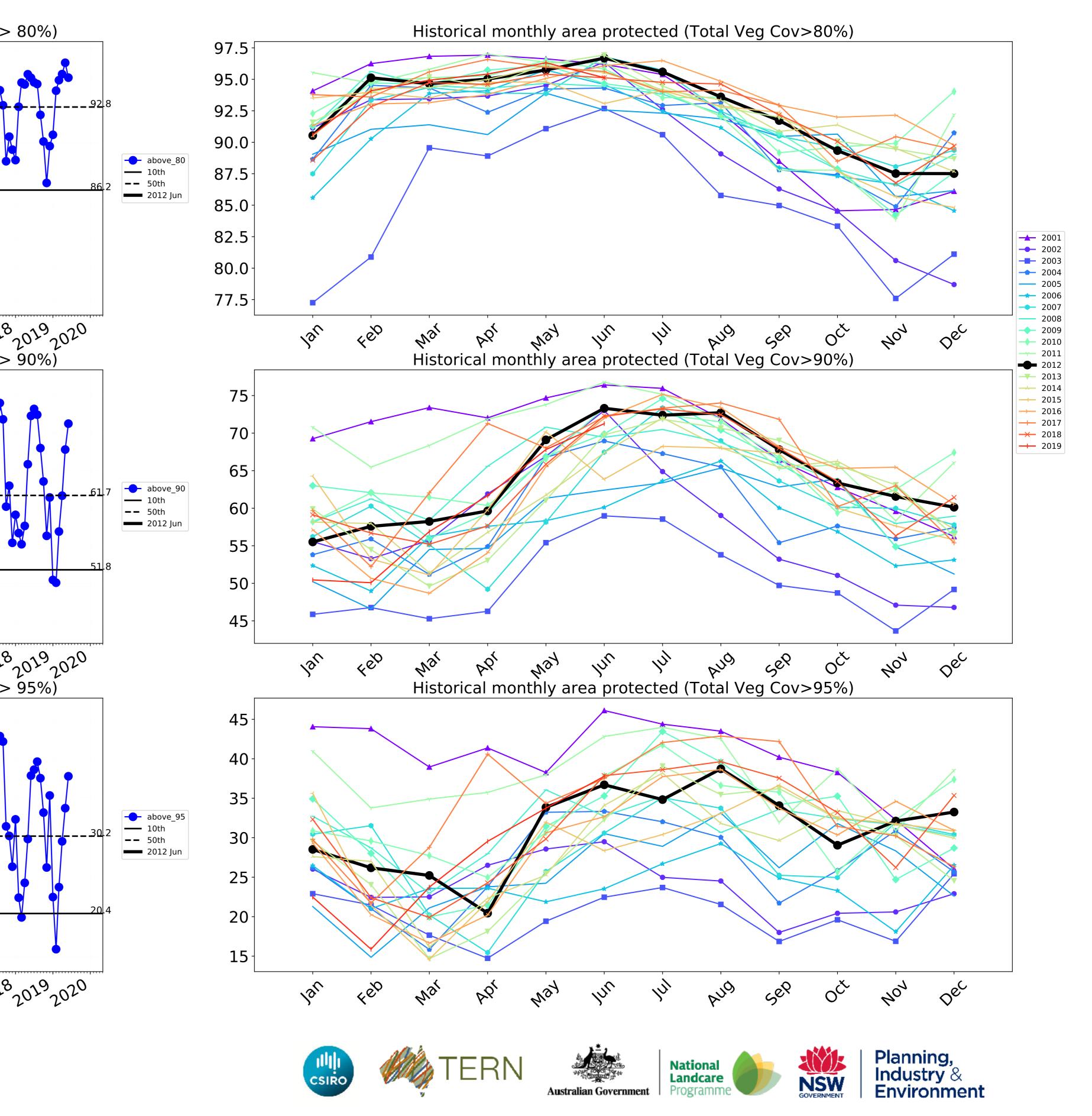
Total Vegetation Cover Decile [%]







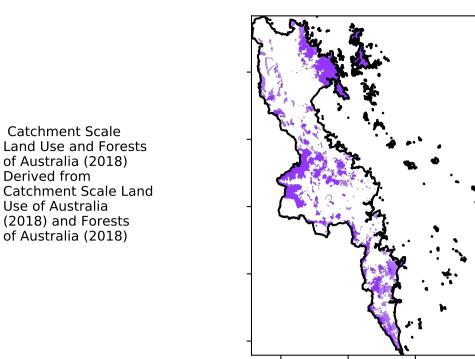




Conservation and natural environments

Land use and forest cover

Proportion of each land class in area

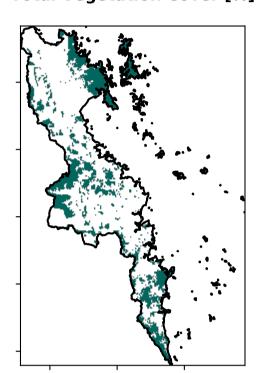


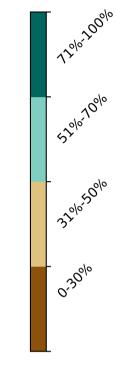
Derived from

Use of Australia

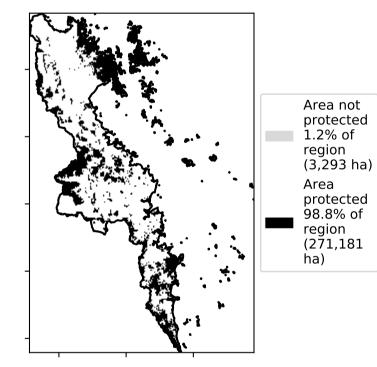
1 Conservation and natural environments - Nonforest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments - Non-woodland forest

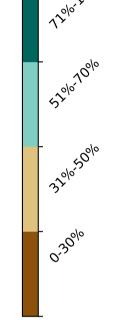
Total Vegetation Cover [%]



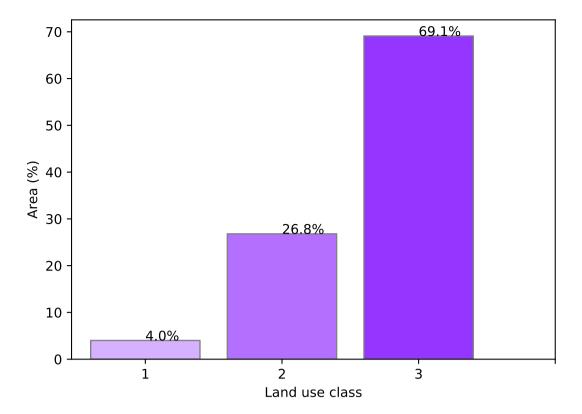


% Area protected from water erosion (>70%)

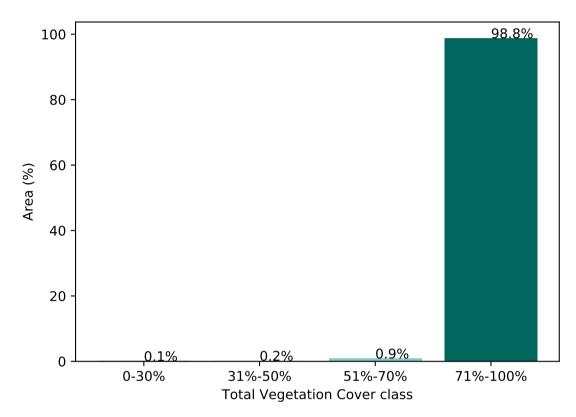




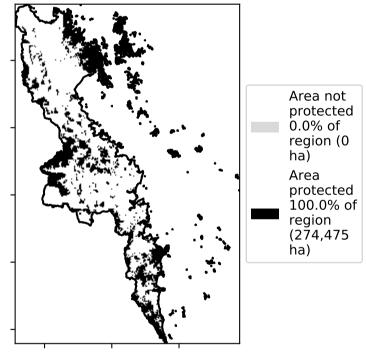




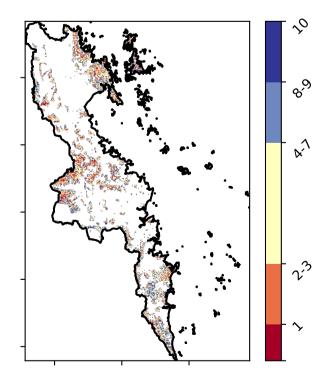
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

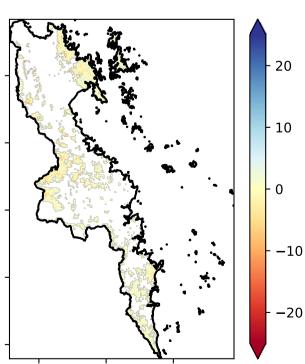


Total Vegetation Cover Decile [%]



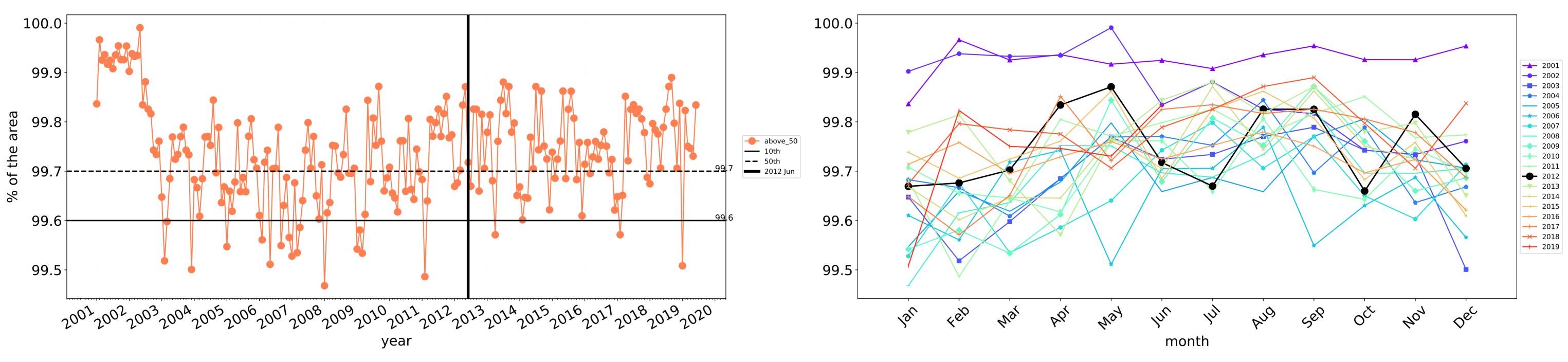
Total Vegetation Cover Anomaly [%]

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.



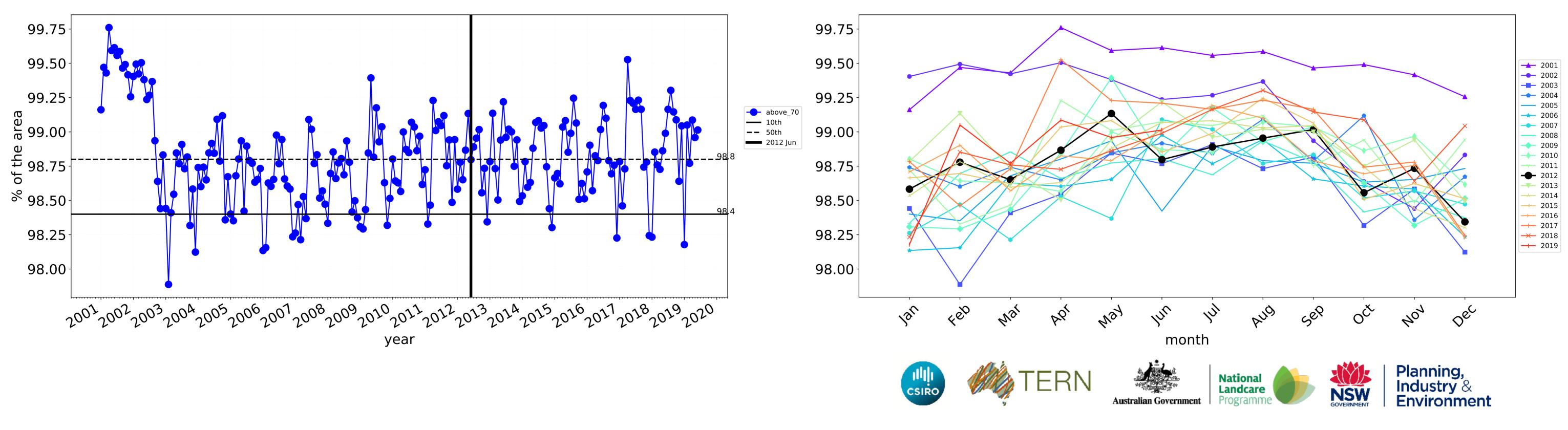
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





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

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



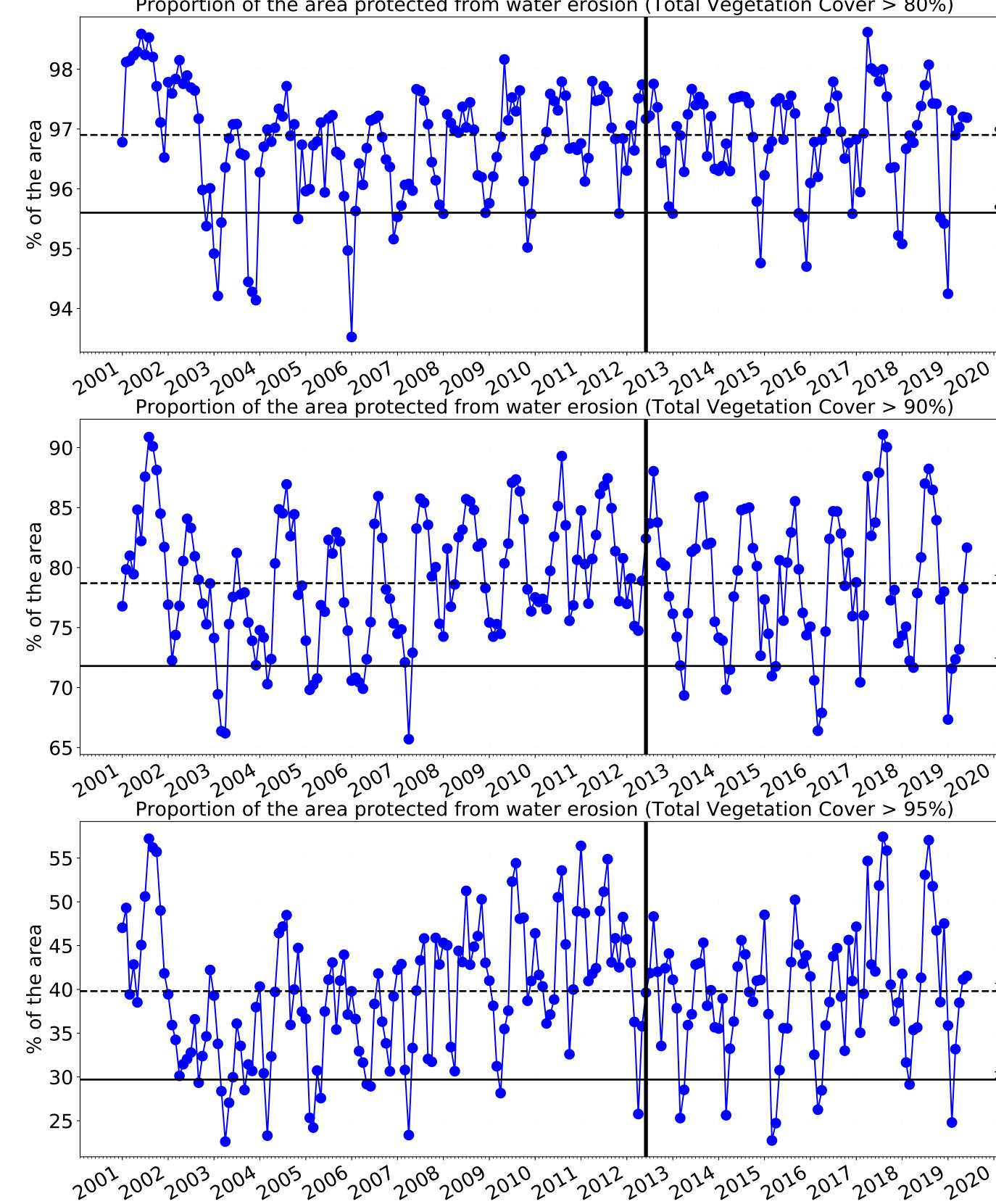
Conservation and natural environments timeseries



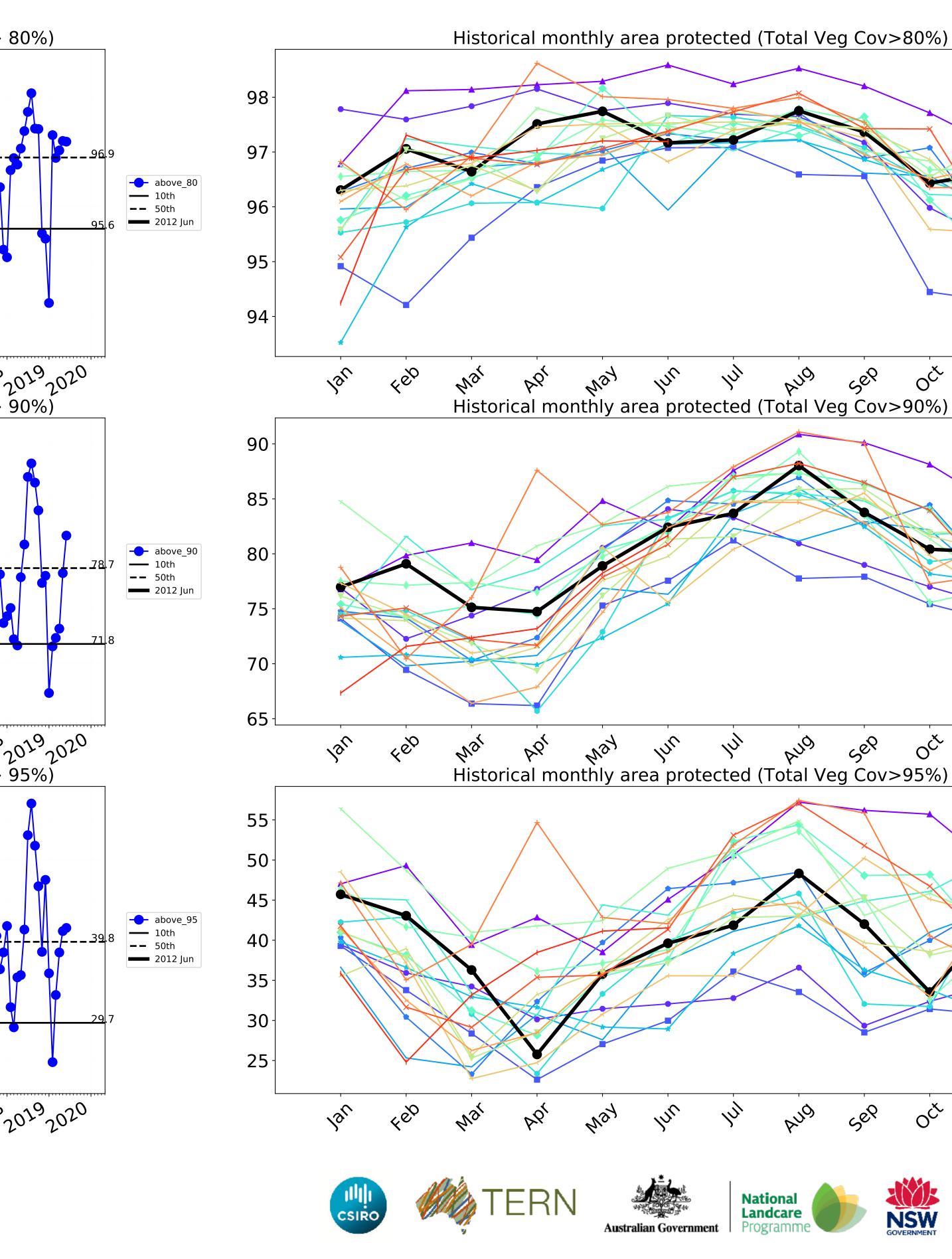
Wind erosion historical monthly area protected (Total Veg Cov >50%)



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



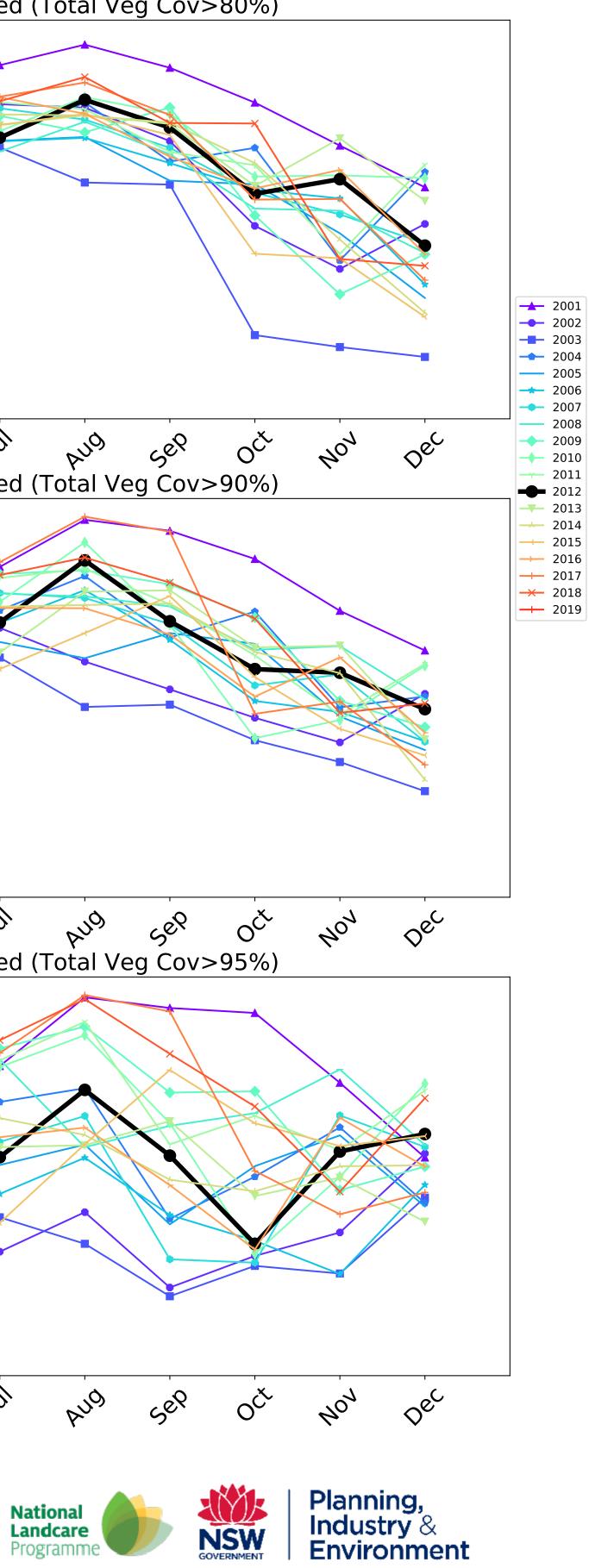
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



1st

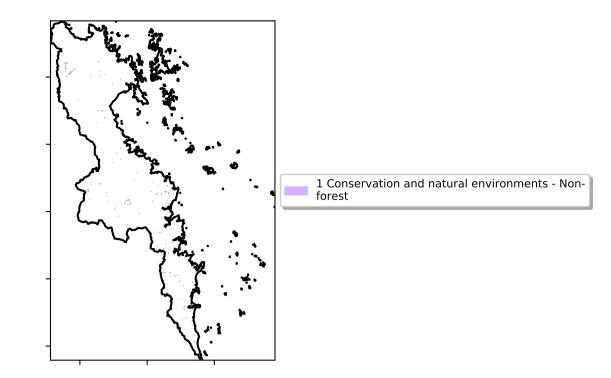
5

12

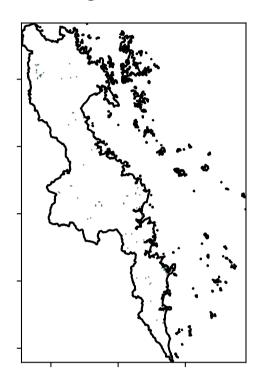


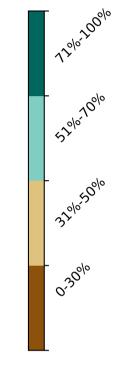
Conservation and natural environments non forest

Land use and forest cover

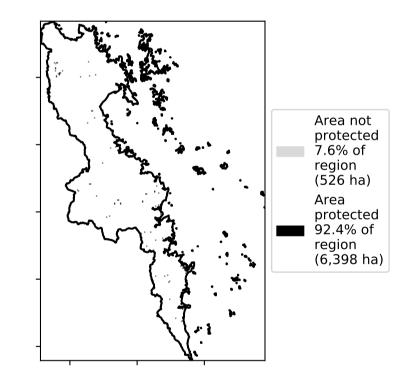


Total Vegetation Cover [%]



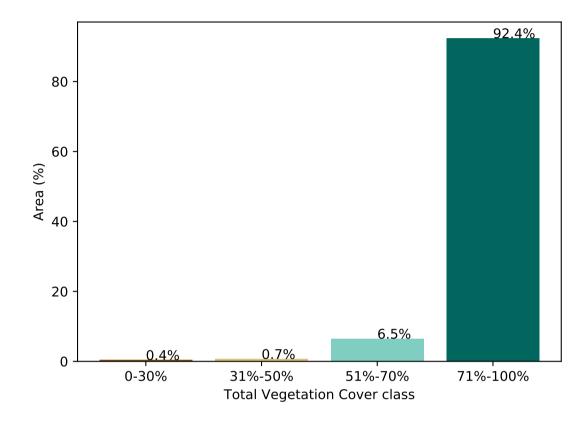


% Area protected from water erosion (>70%)

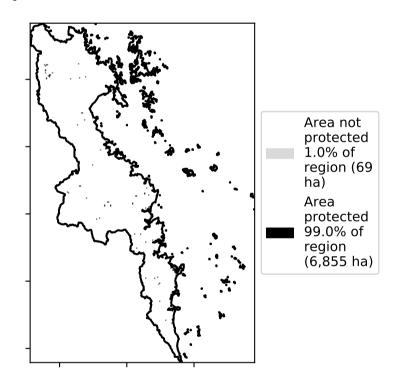




Proportion of vegetation cover class in area

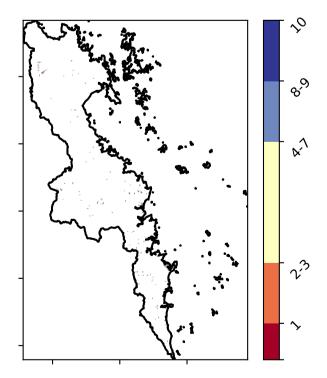


% Area protected from wind erosion (>50%)



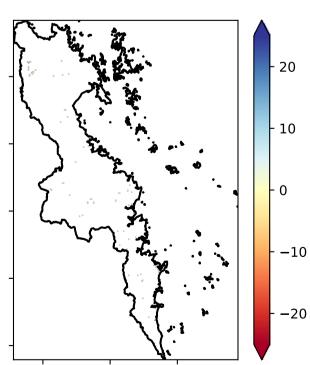
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]



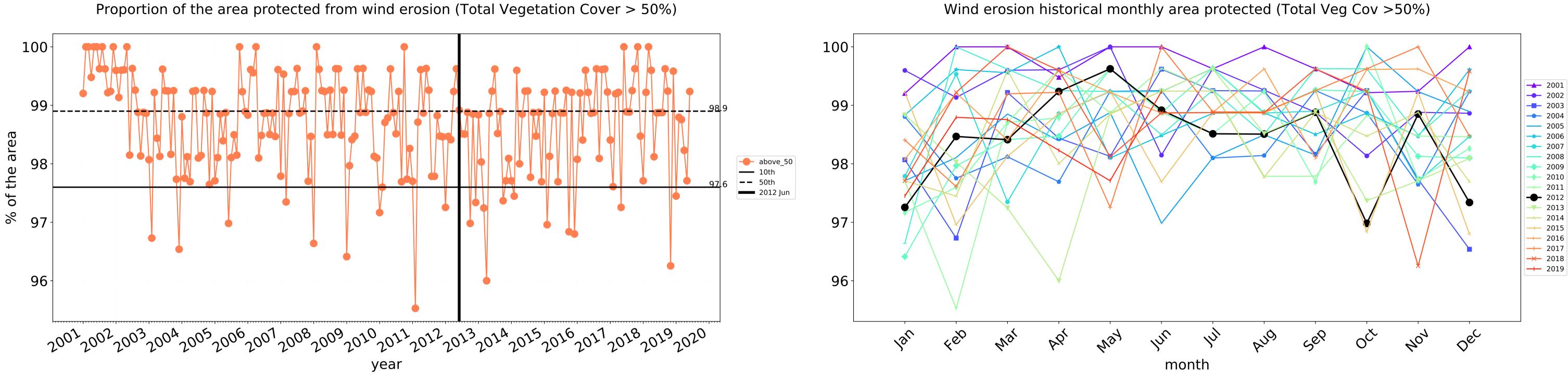
Total Vegetation Cover Anomaly [%]

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.

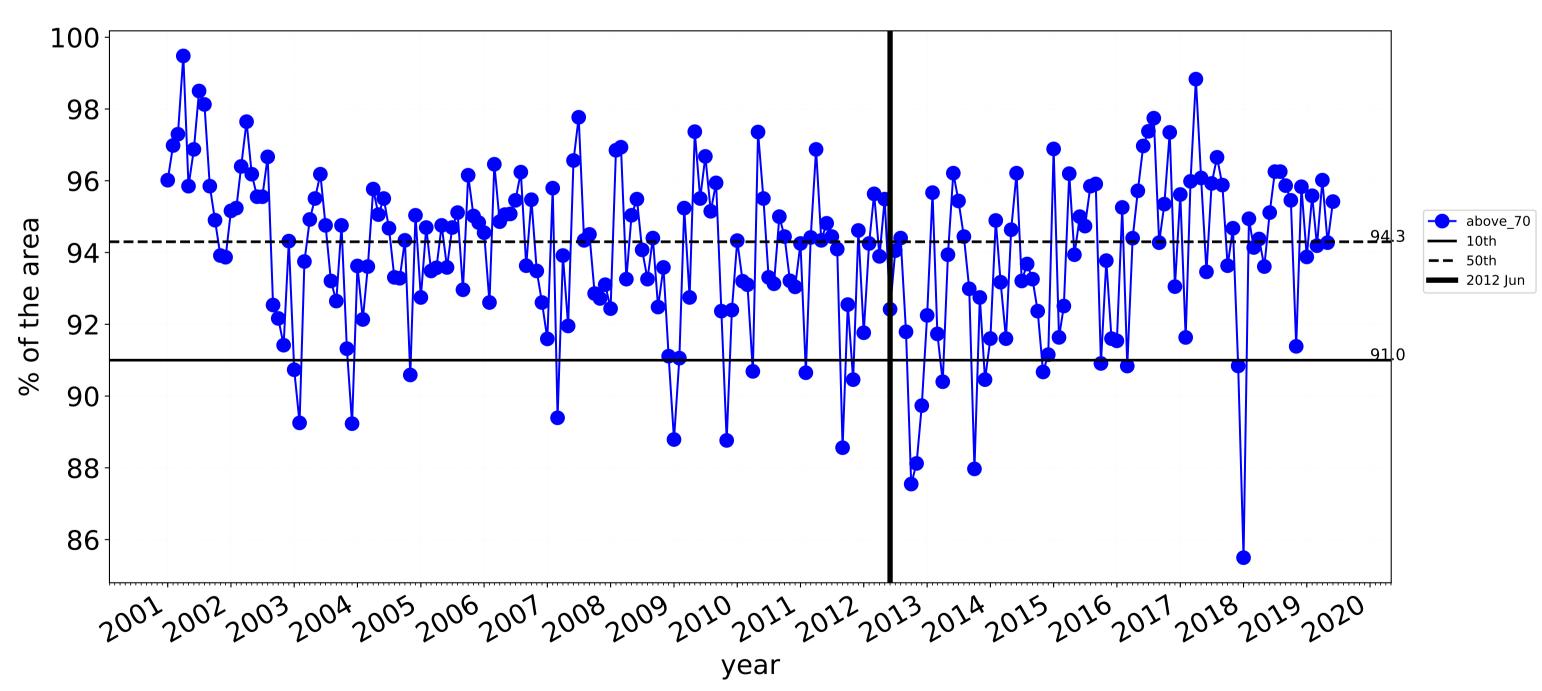


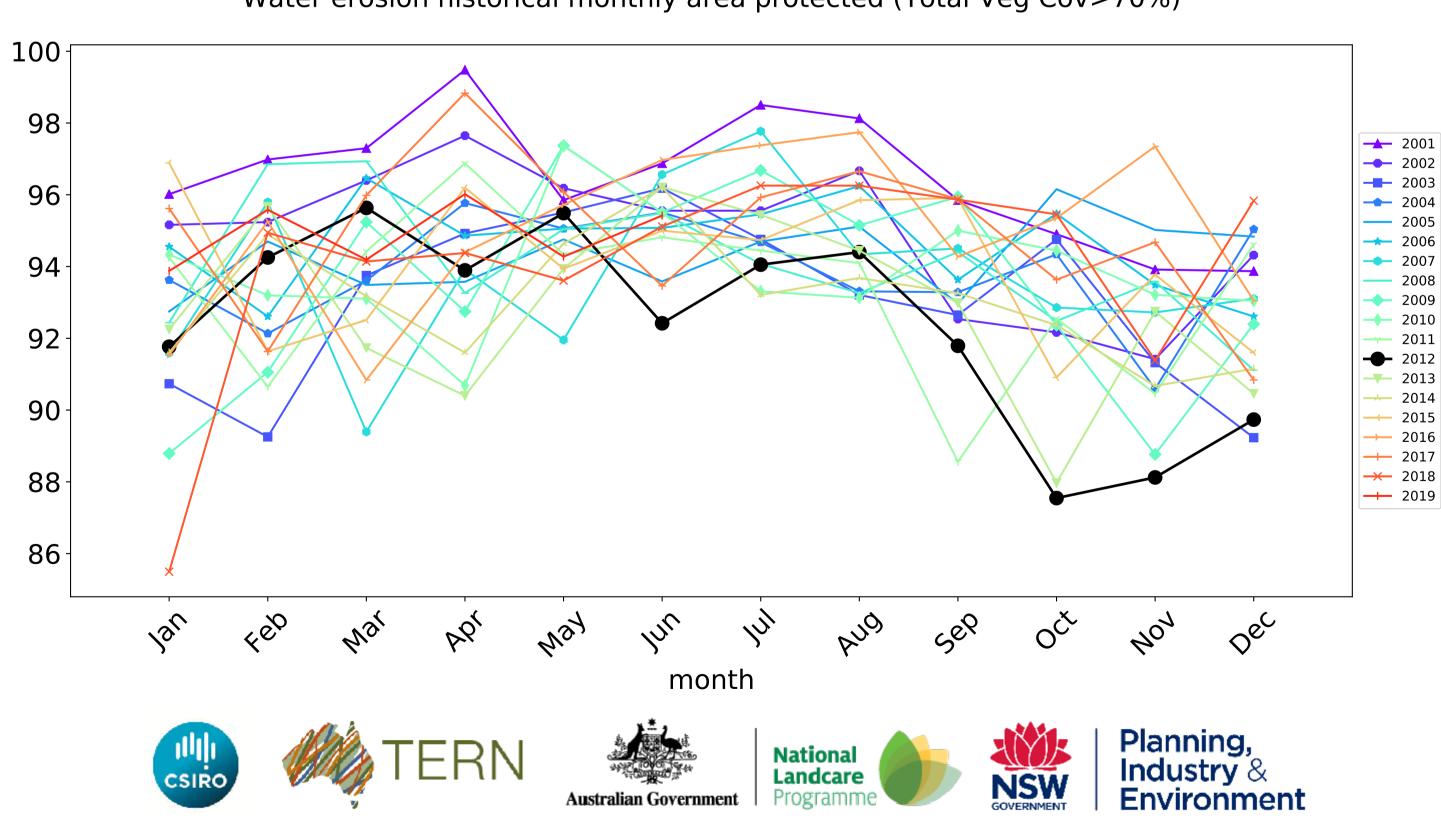
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



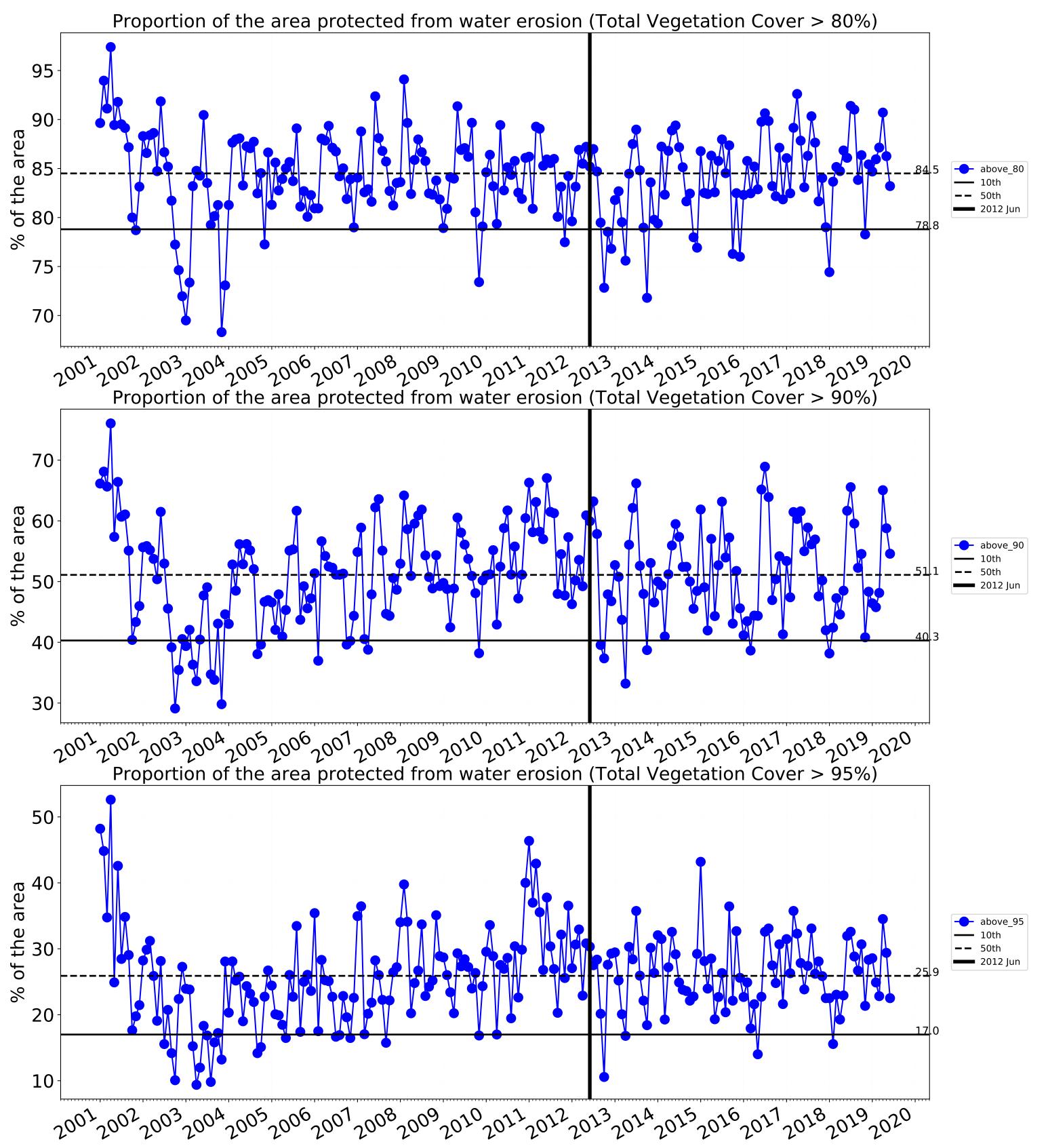


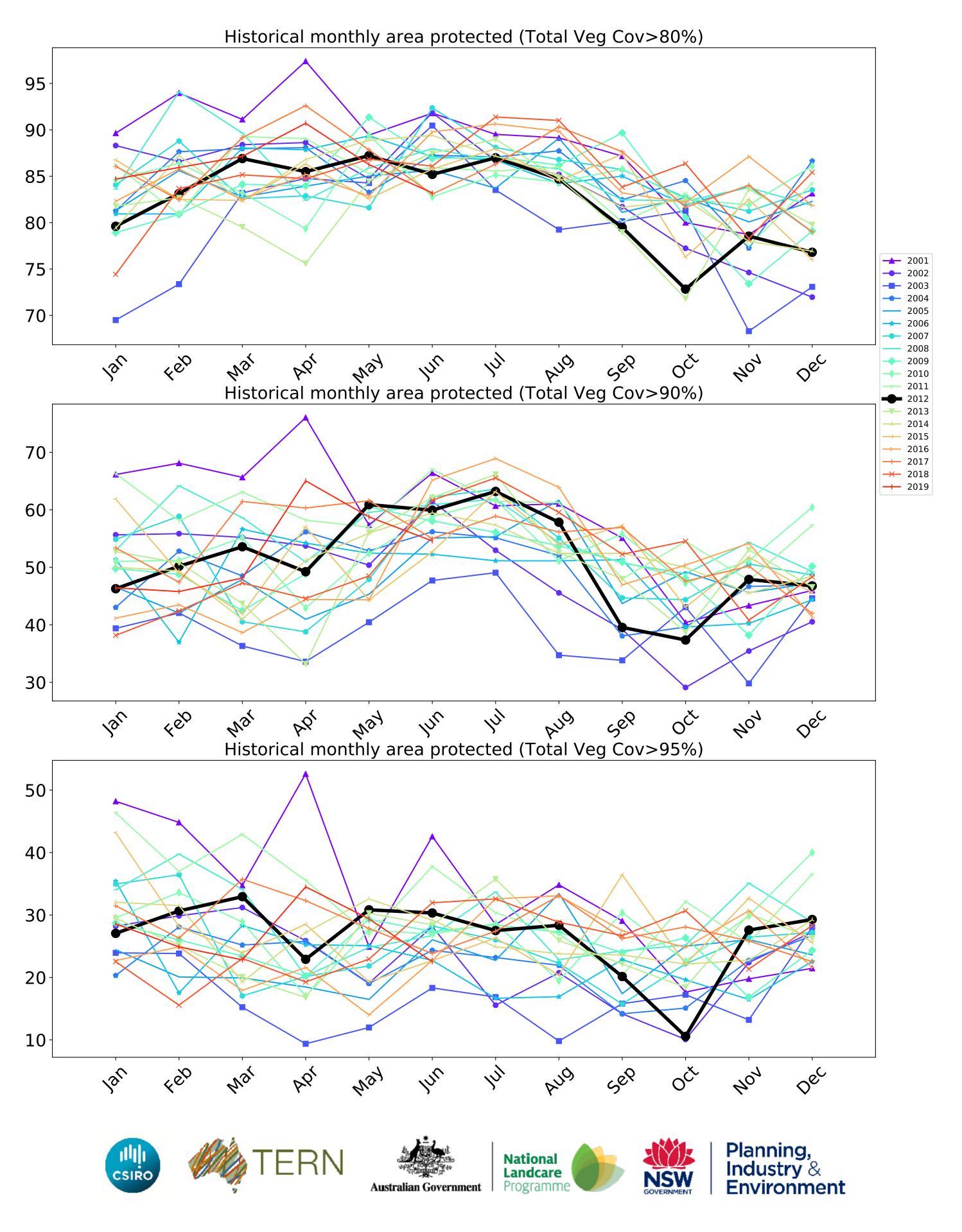






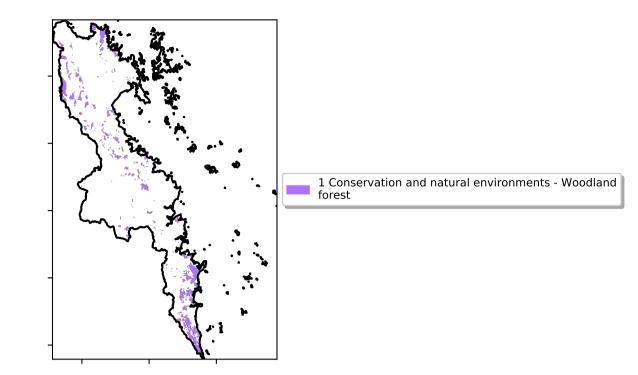
Water erosion historical monthly area protected (Total Veg Cov>70%)



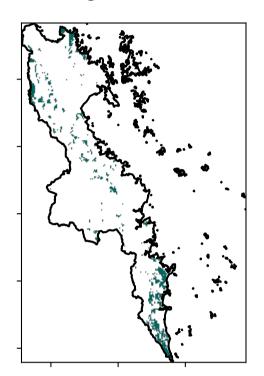


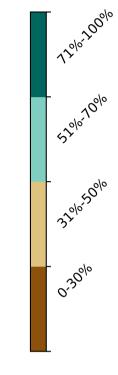
Conservation and natural environments Woodland forest

Land use and forest cover

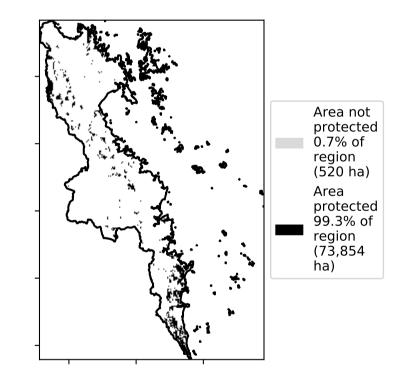


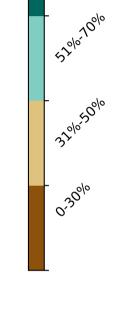
Total Vegetation Cover [%]





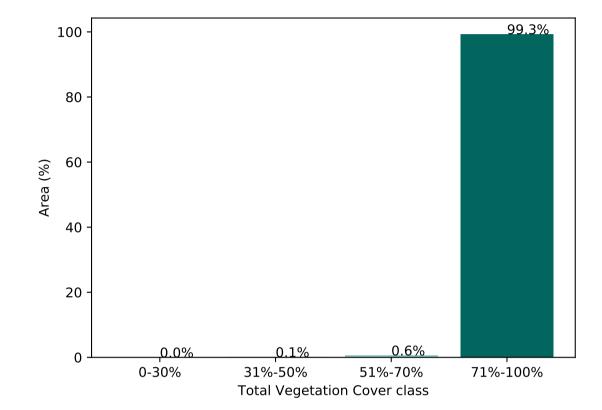
% Area protected from water erosion (>70%)



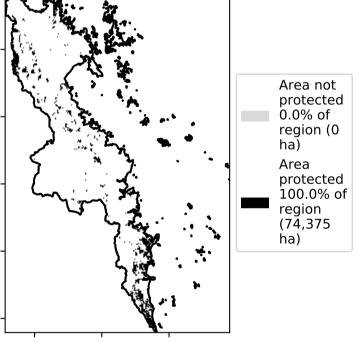




Proportion of vegetation cover class in area



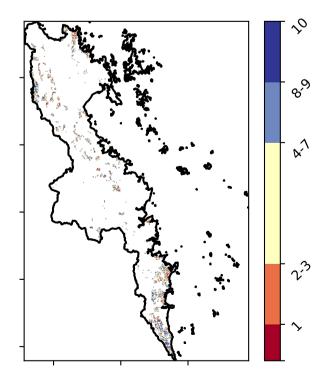
% Area protected from wind erosion (>50%)



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

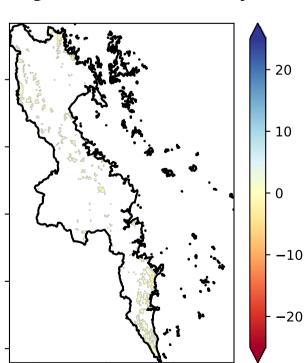
Catchment Scale

Total Vegetation Cover Decile [%]



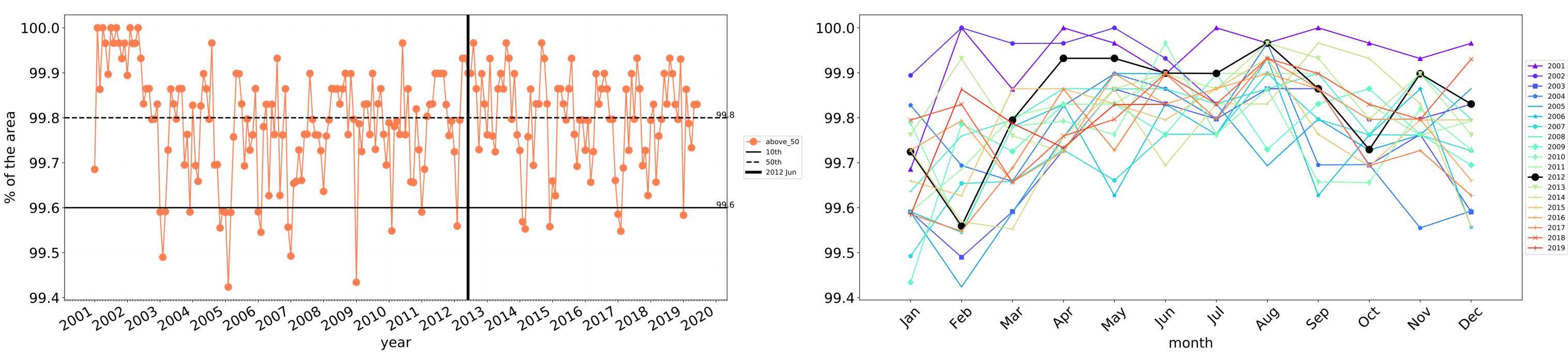
Total Vegetation Cover Anomaly [%]

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.



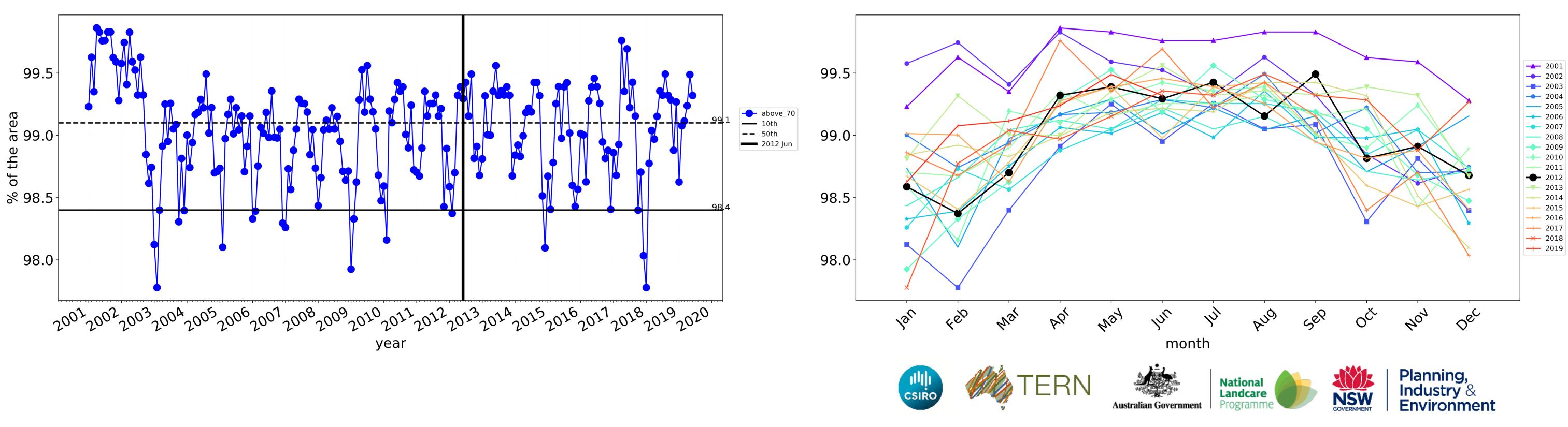
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





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

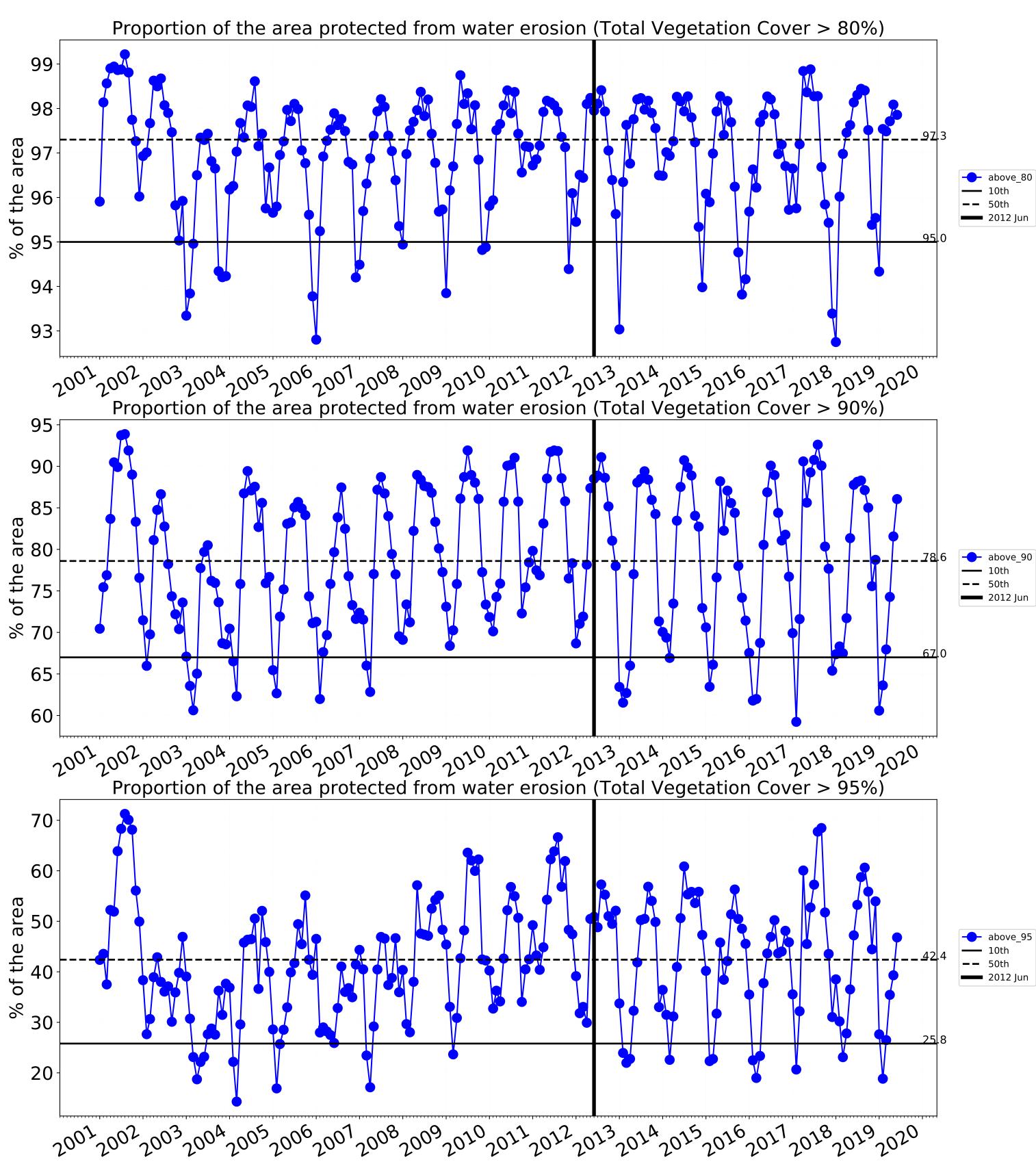
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

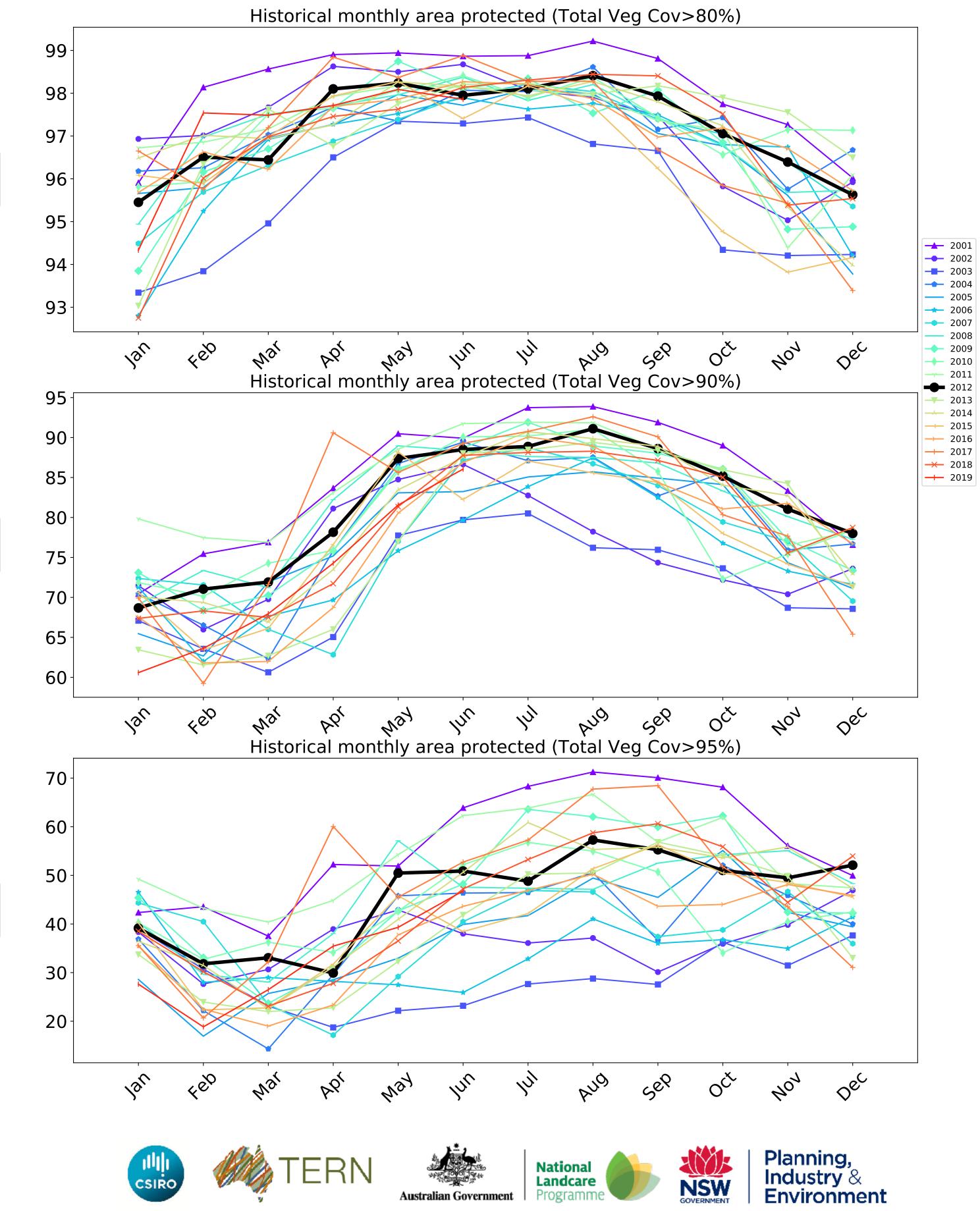


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Wind erosion historical monthly area protected (Total Veg Cov >50%)

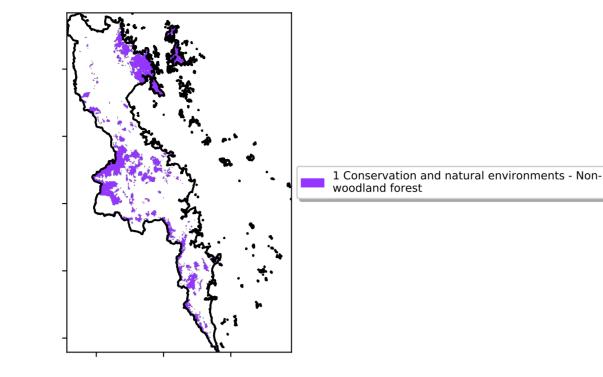
Water erosion historical monthly area protected (Total Veg Cov>70%)



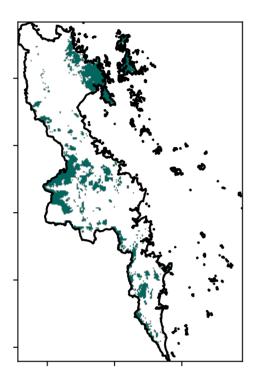


Conservation and natural environments Forest (non woodland)

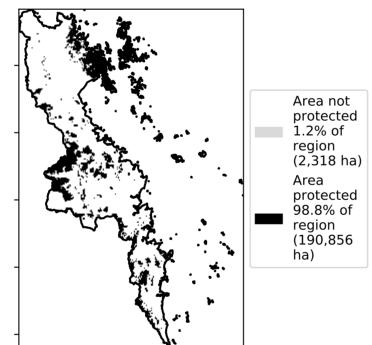
Land use and forest cover

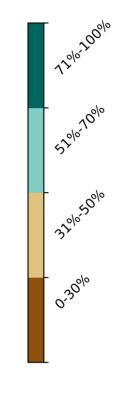


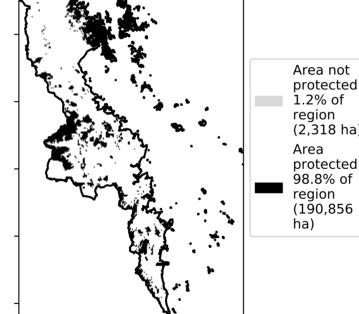
Total Vegetation Cover [%]



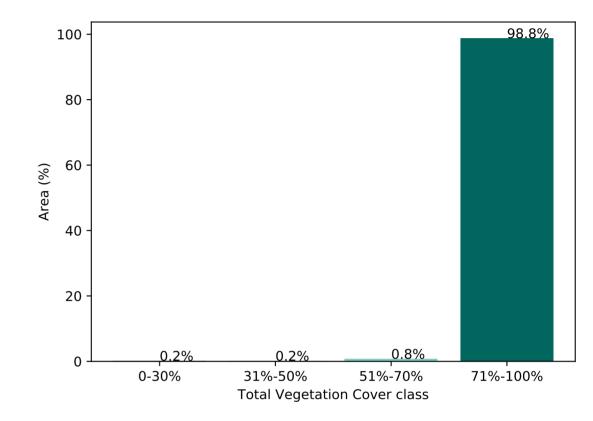




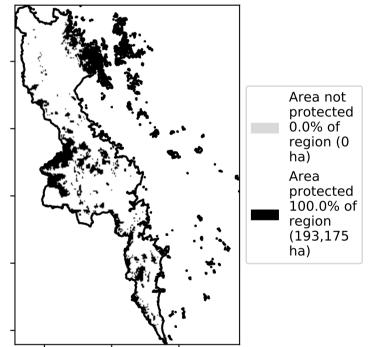




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



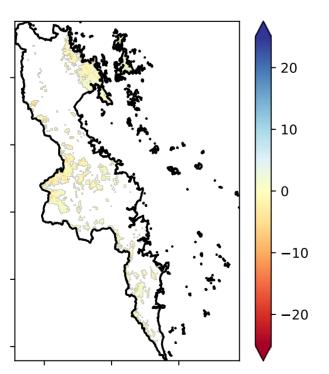
Total Vegetation Cover Anomaly [%]

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.

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

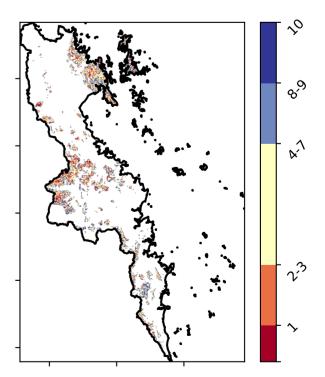
Use of Australia (2018) and Forests of Australia (2018)

Catchment Scale Land

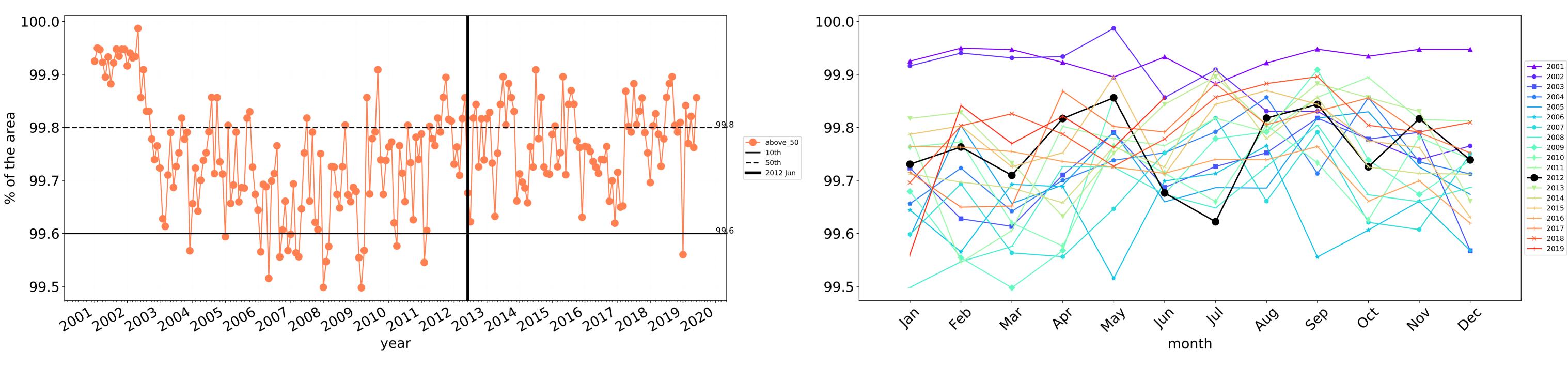


Total Vegetation Cover Decile [%]

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.

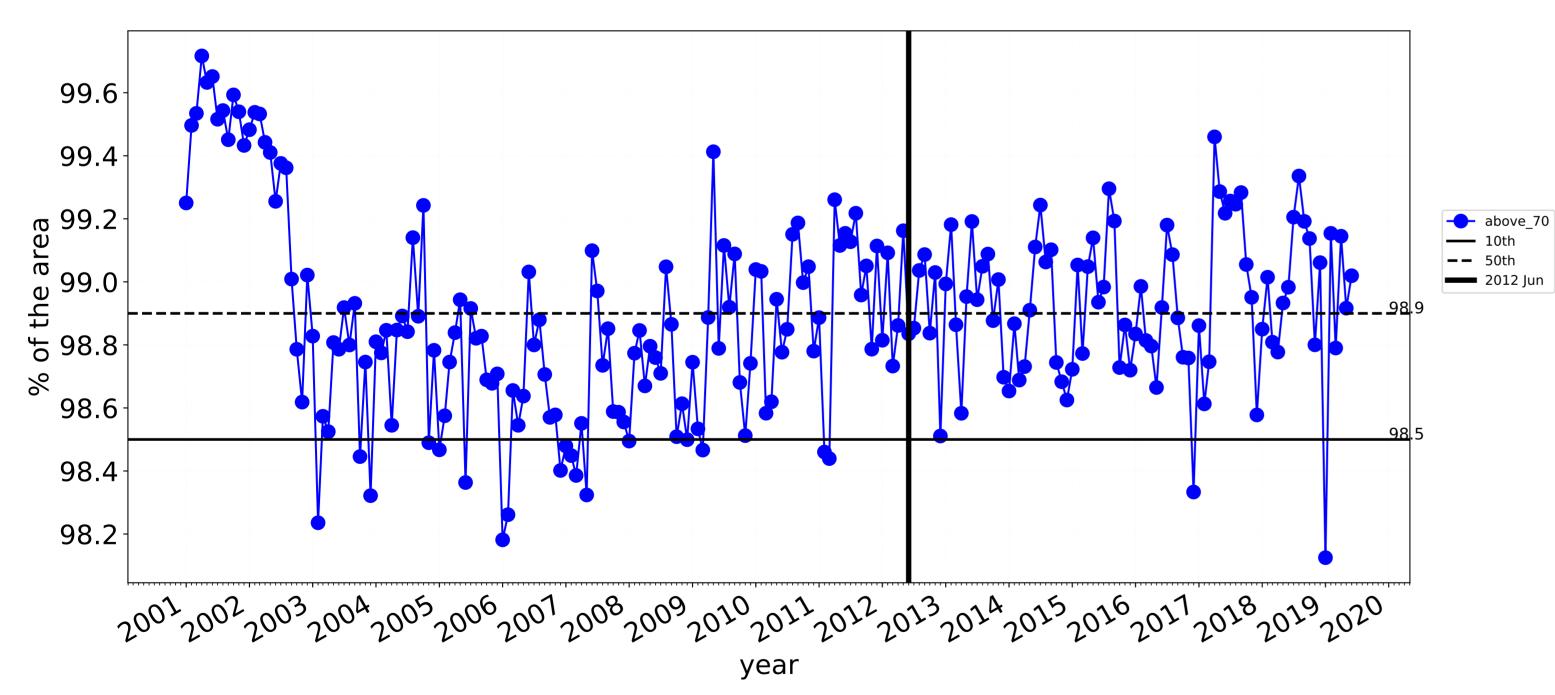


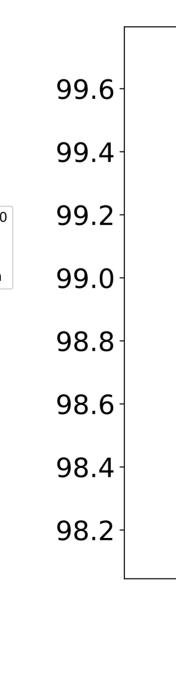


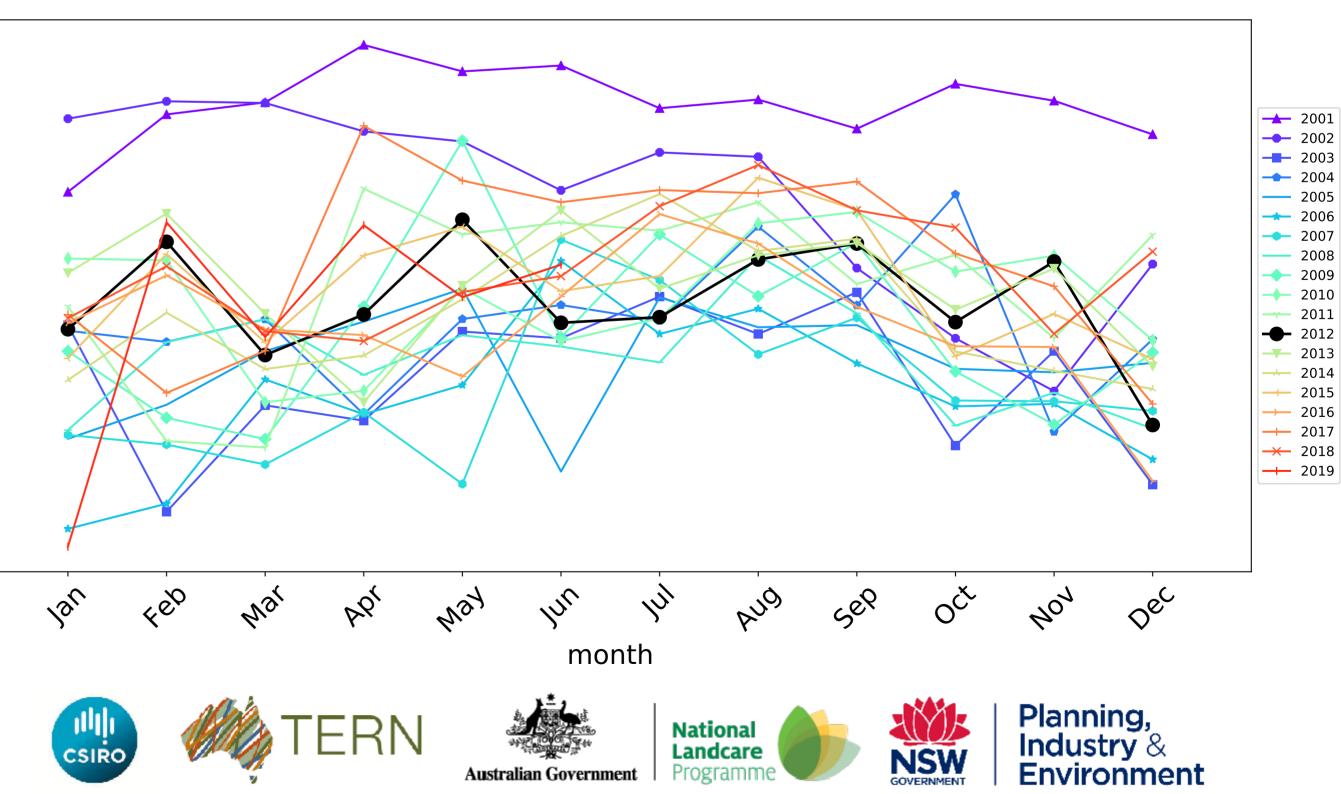


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

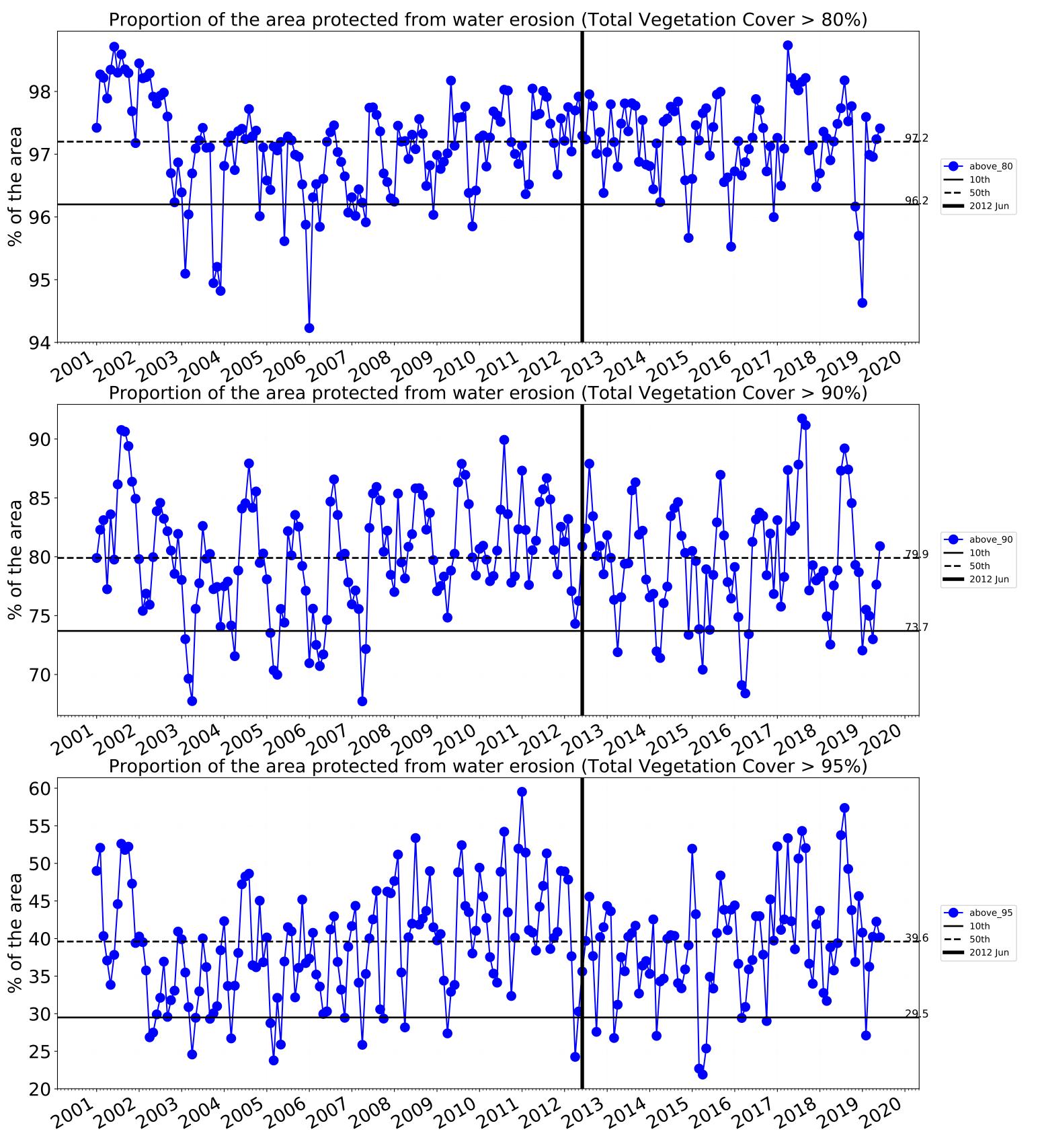


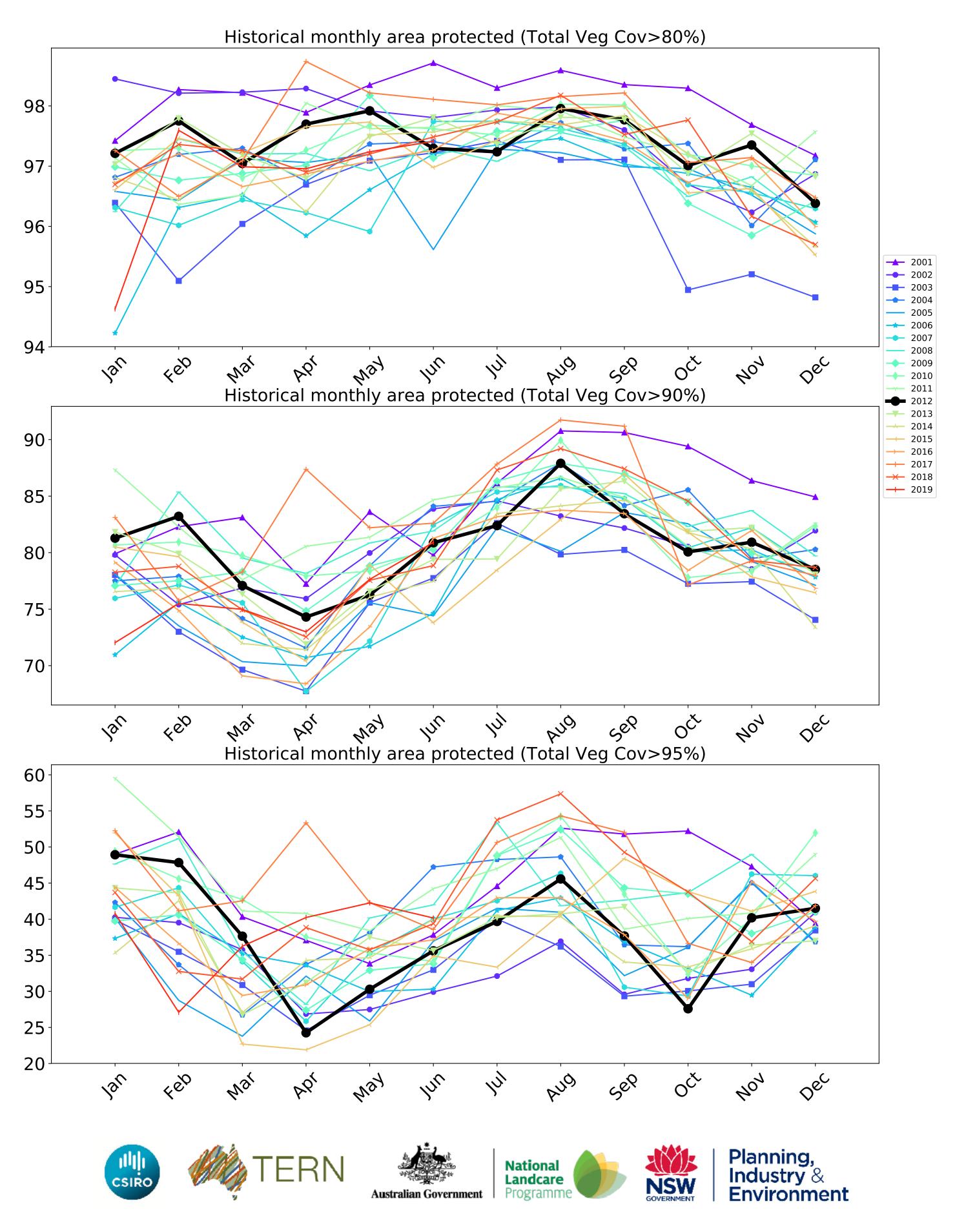




Wind erosion historical monthly area protected (Total Veg Cov >50%)

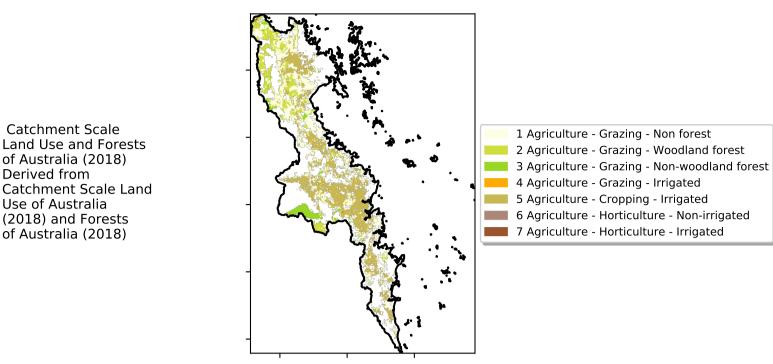
Water erosion historical monthly area protected (Total Veg Cov>70%)



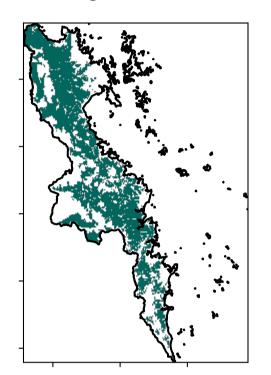


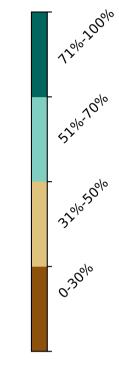
Agriculture

Land use and forest cover

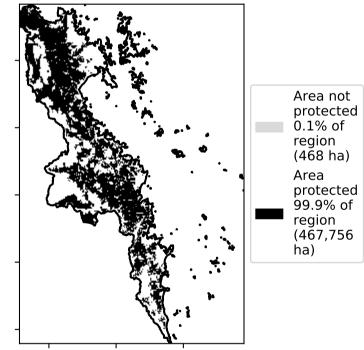


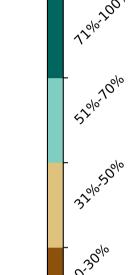
Total Vegetation Cover [%]





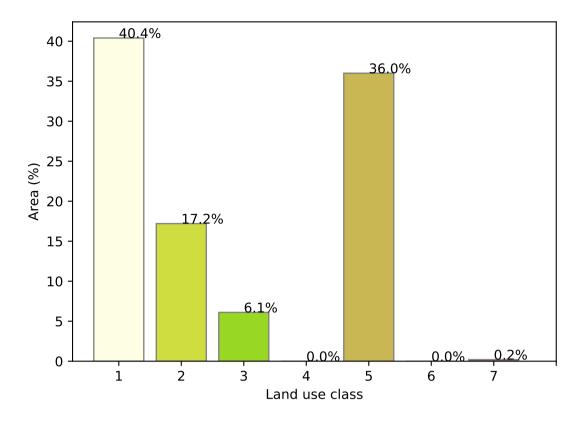
% Area protected from water erosion (>70%)



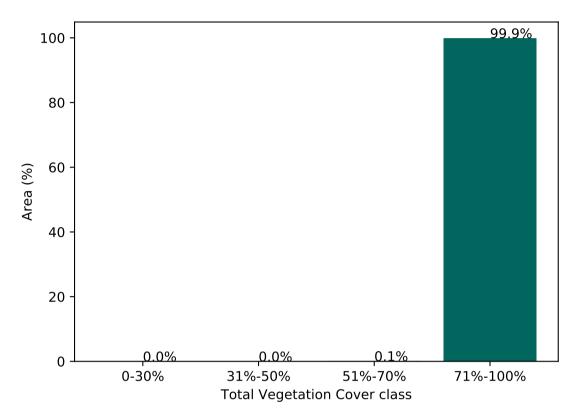




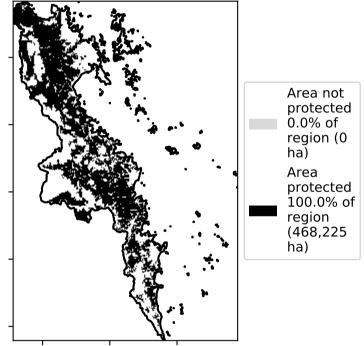
Proportion of each land class in area



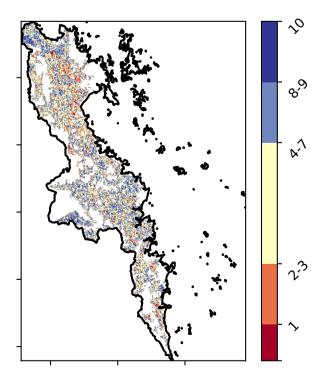
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover 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.

Catchment Scale

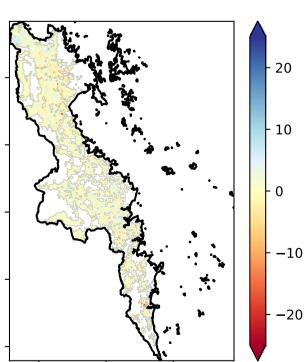
of Australia (2018)

(2018) and Forests

of Australia (2018)

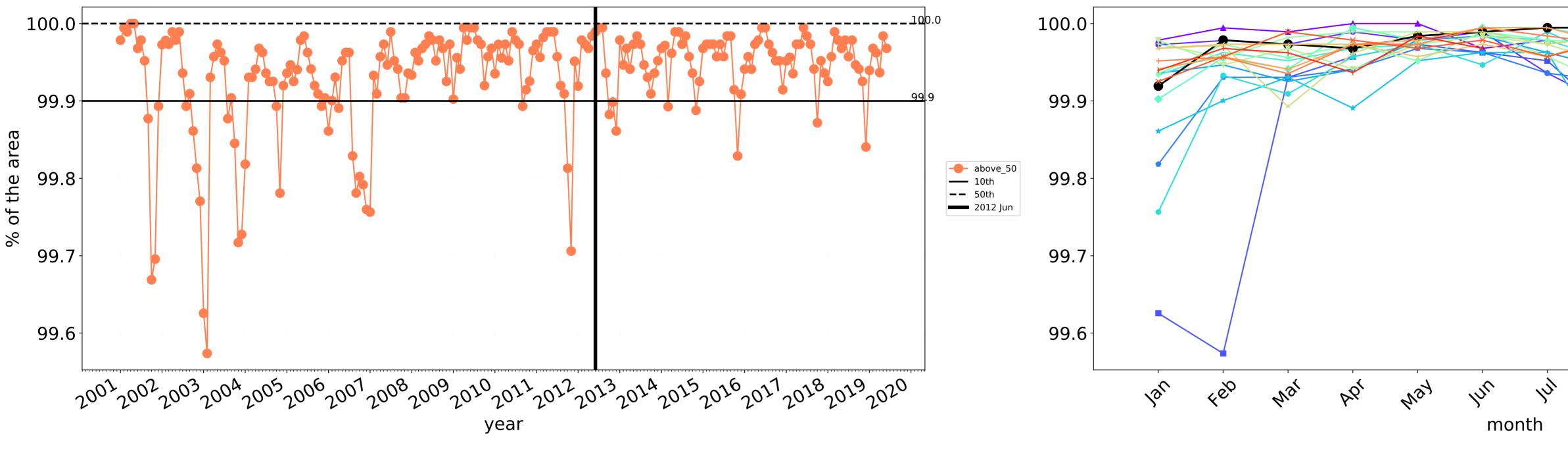
Derived from

Use of Australia

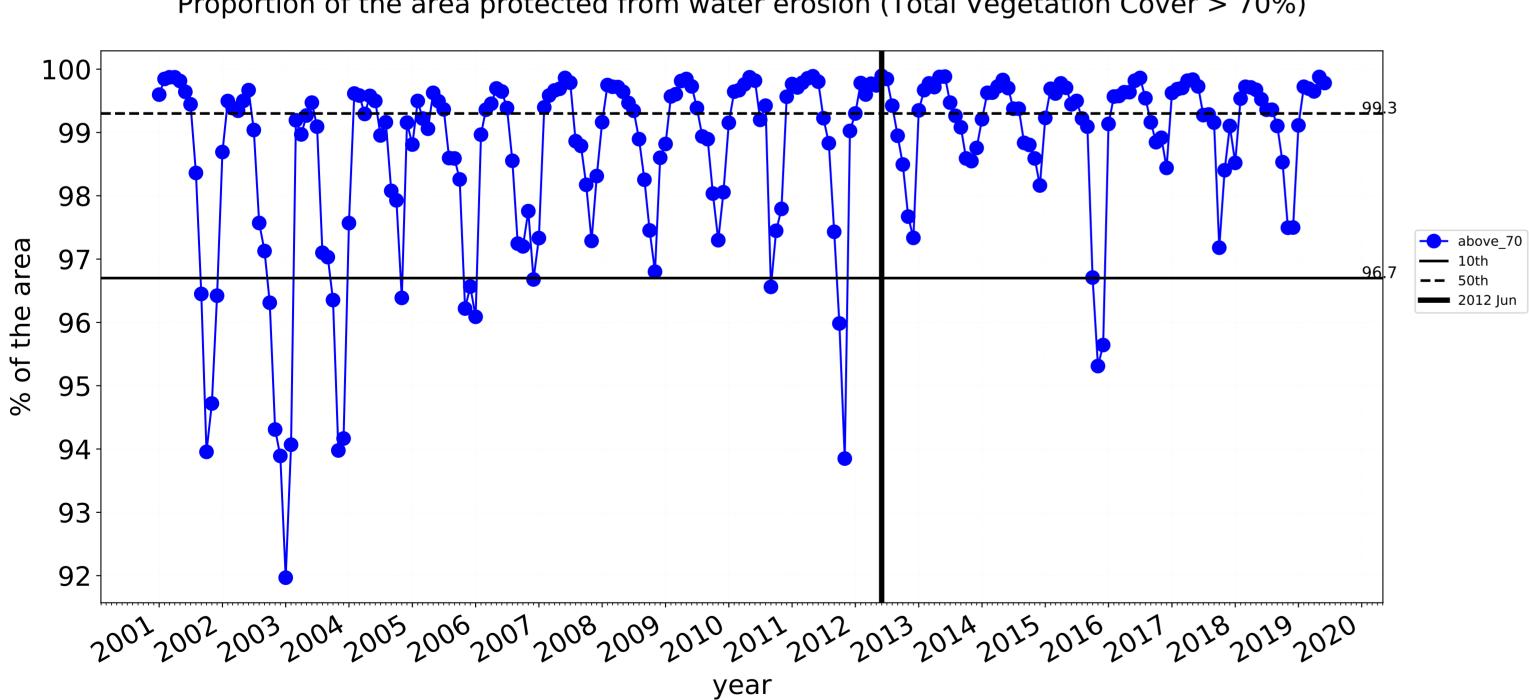


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





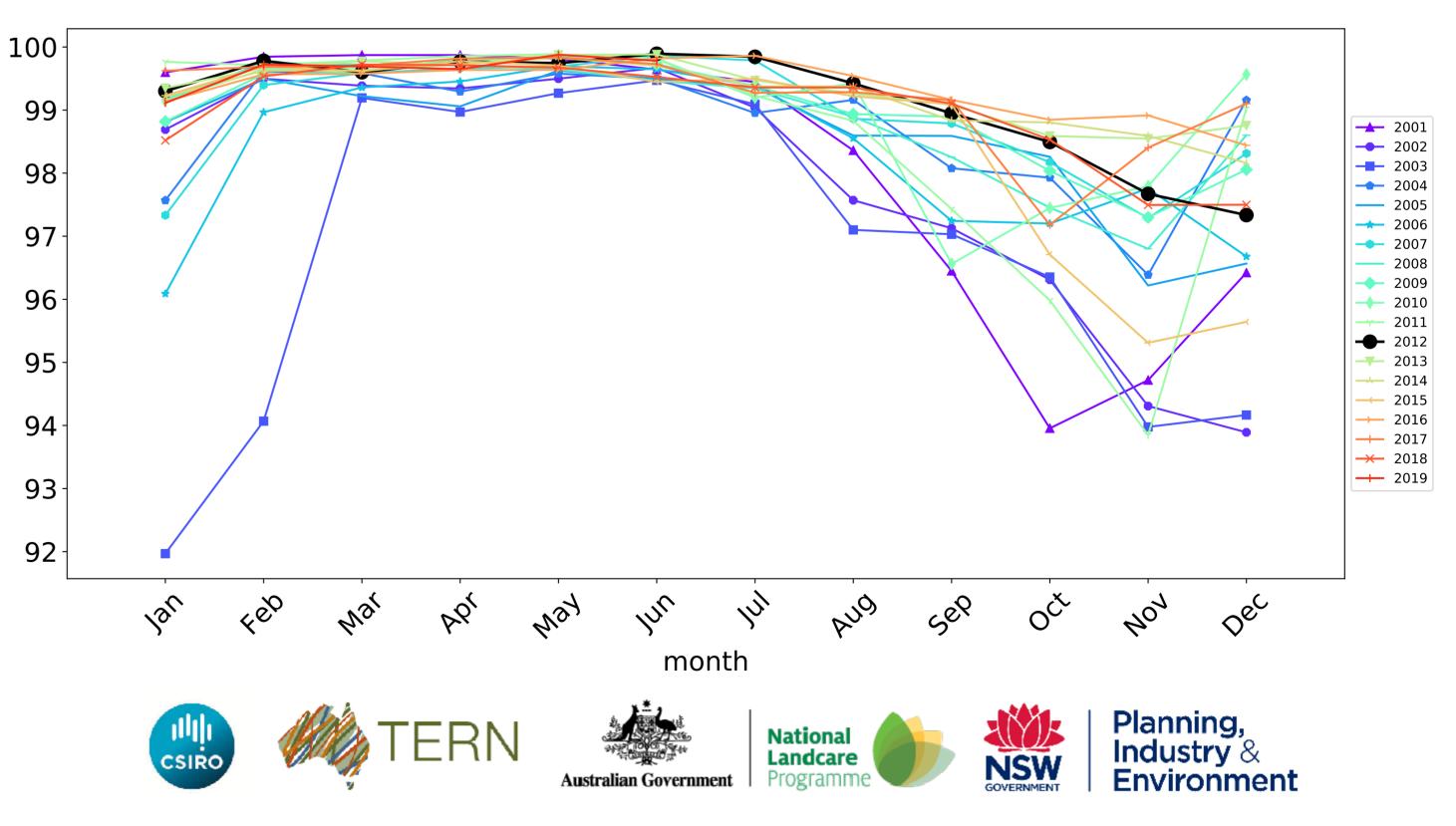
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



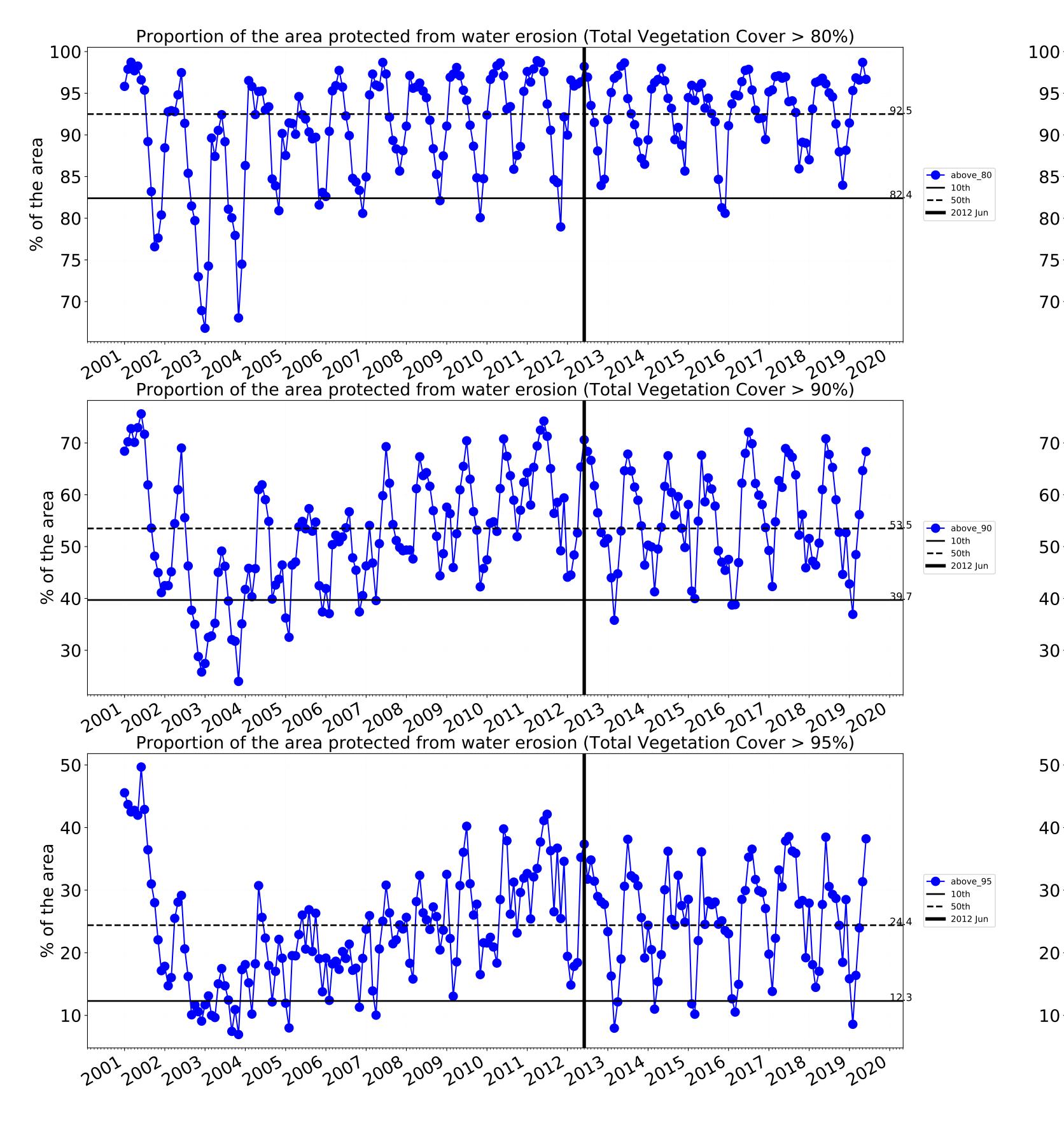
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

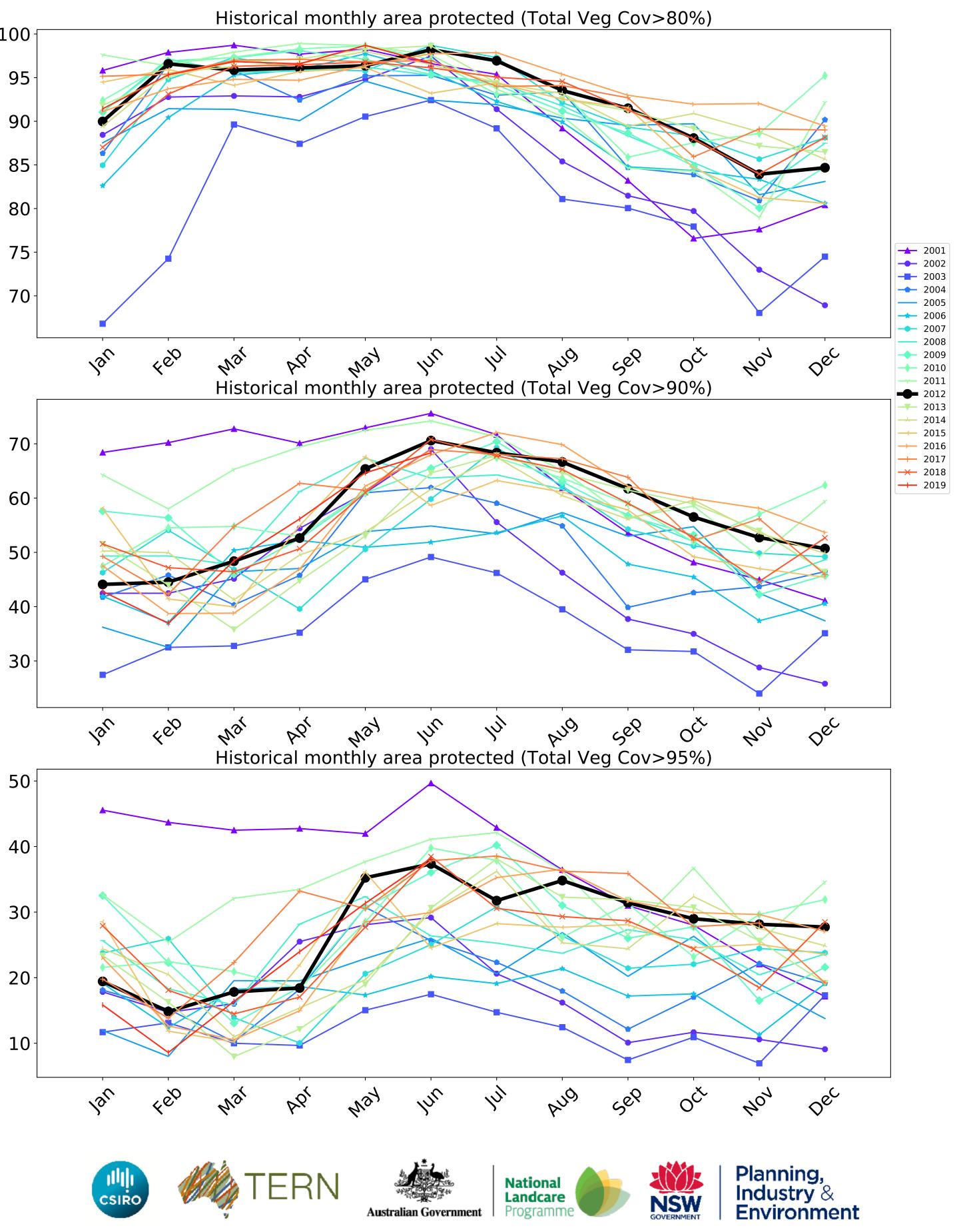
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



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

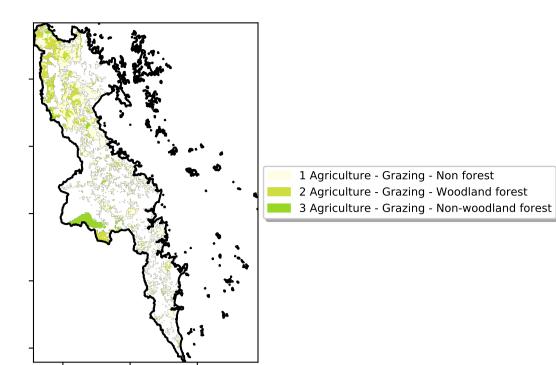




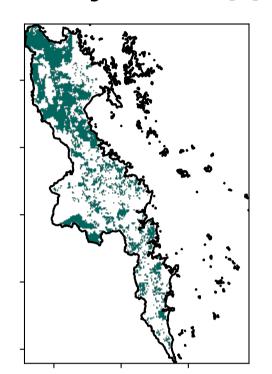
Grazing

Land use and forest cover

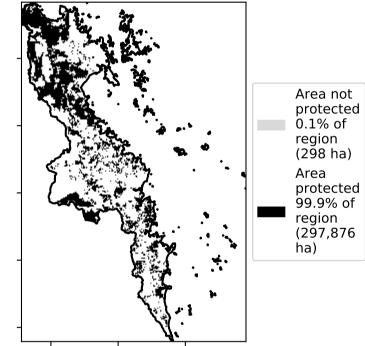
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

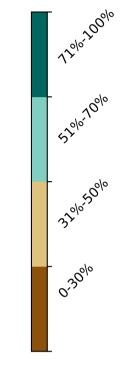


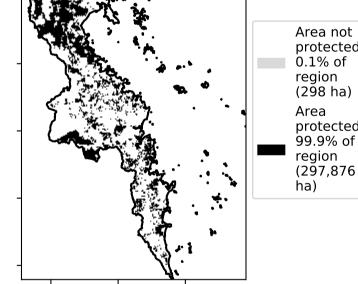
Total Vegetation Cover [%]



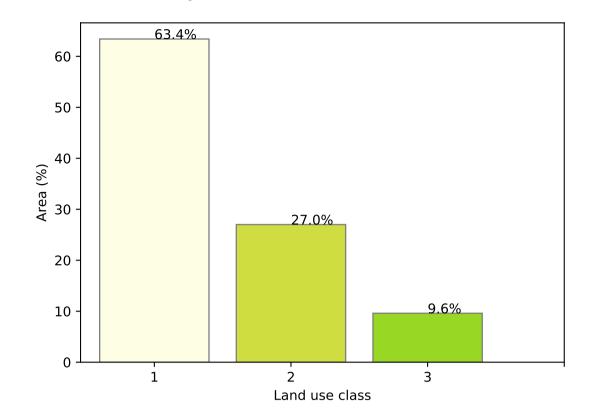




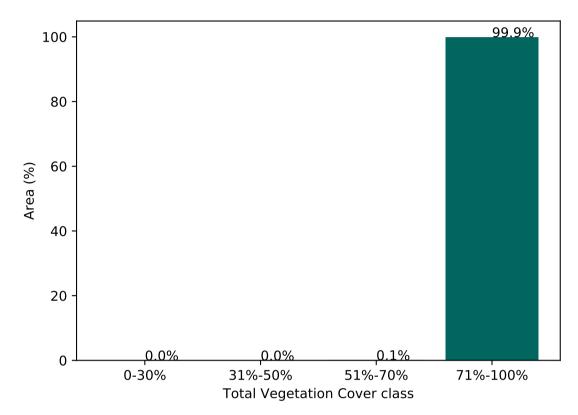




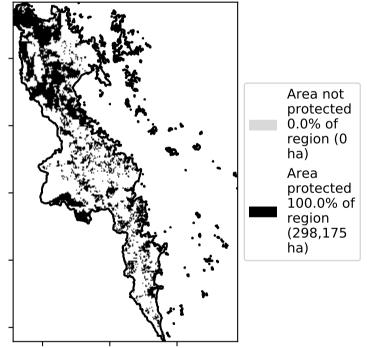
Proportion of each land class in area



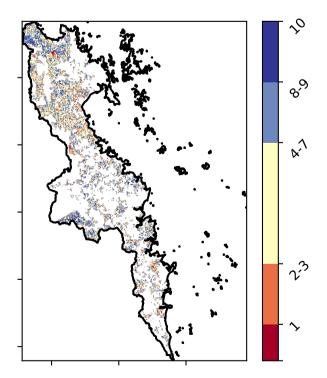
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

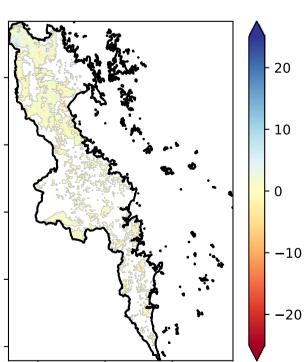


Total Vegetation Cover Decile [%]



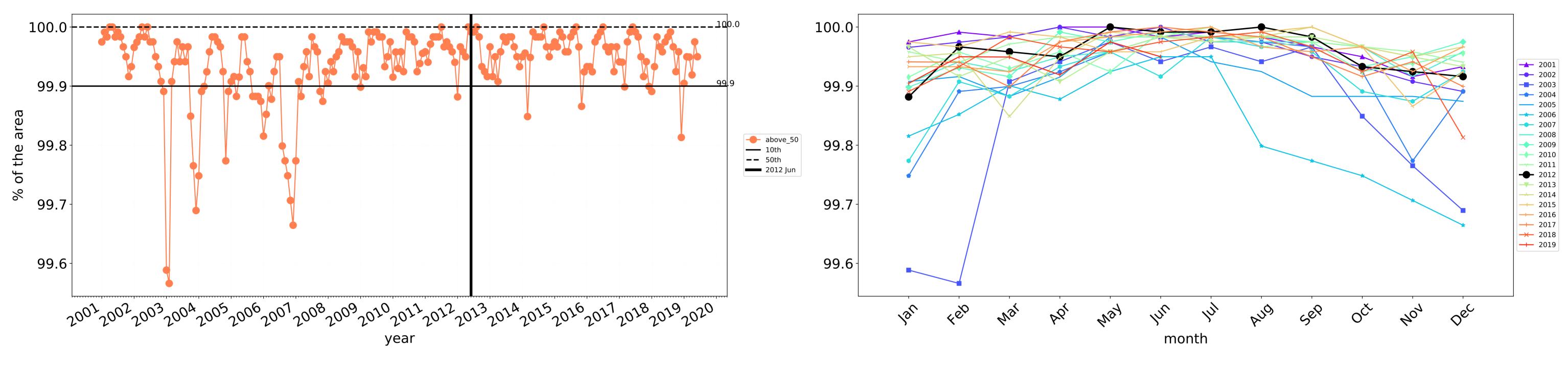
Total Vegetation Cover Anomaly [%]

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.

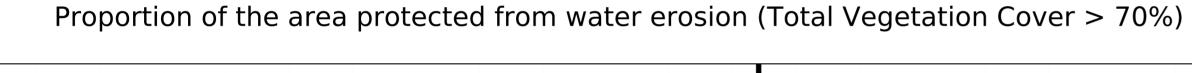


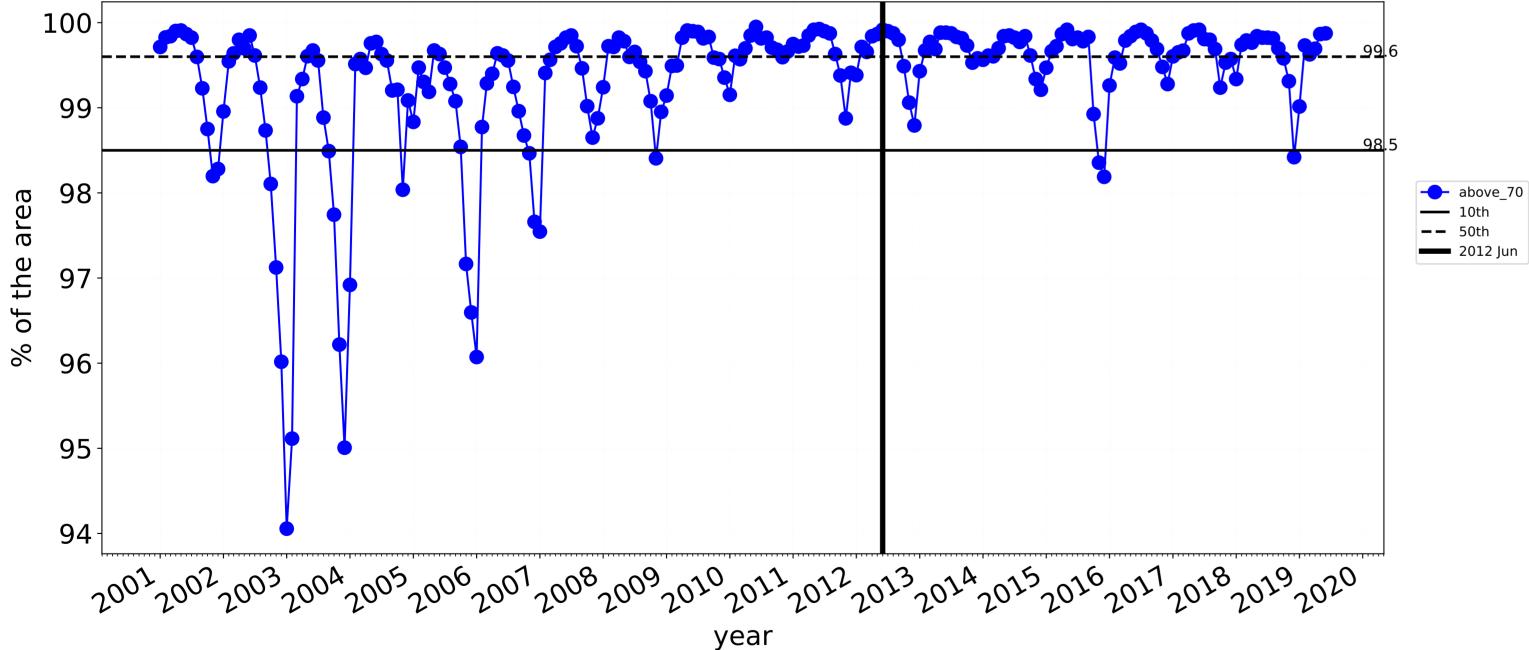
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





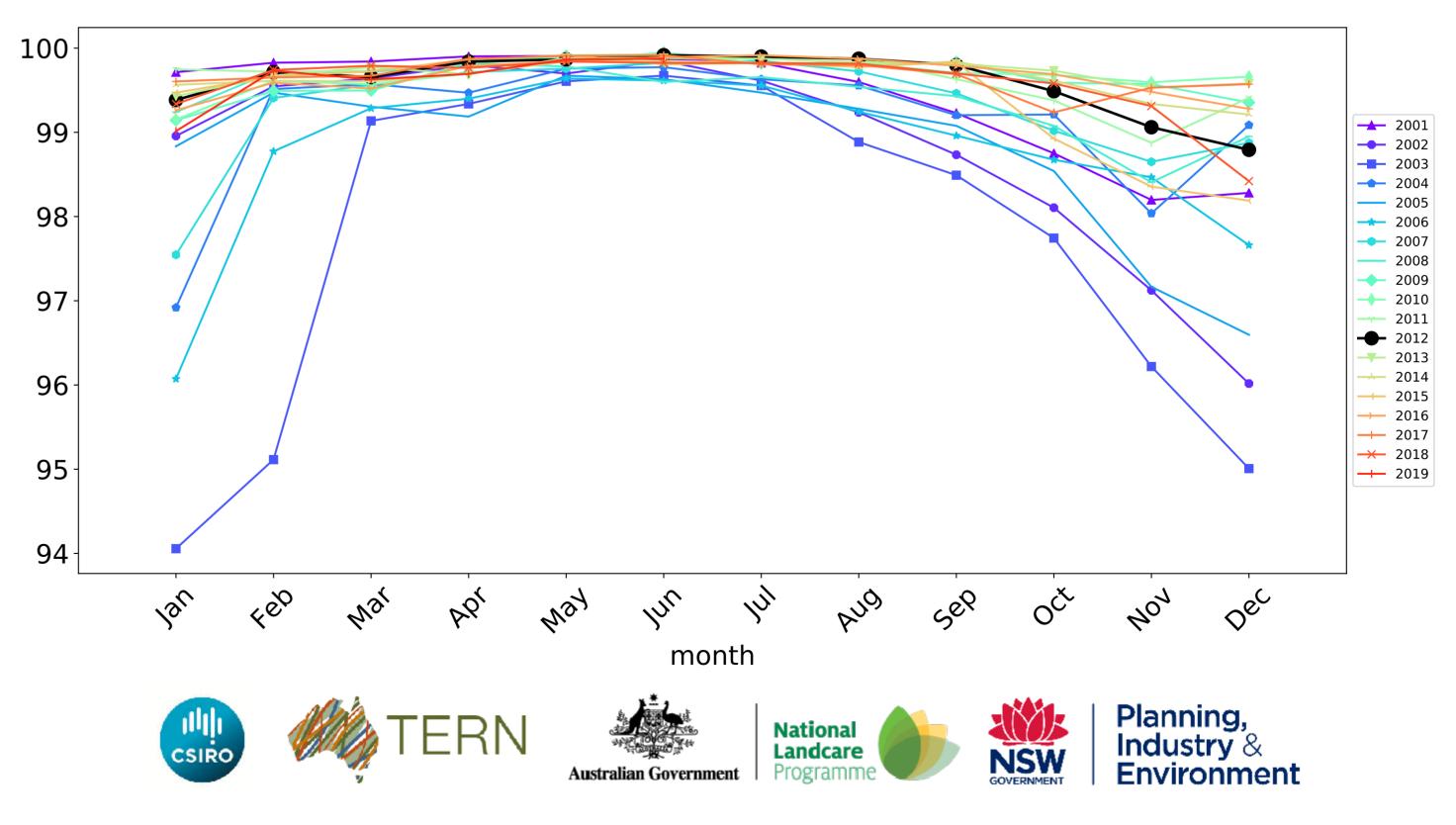
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

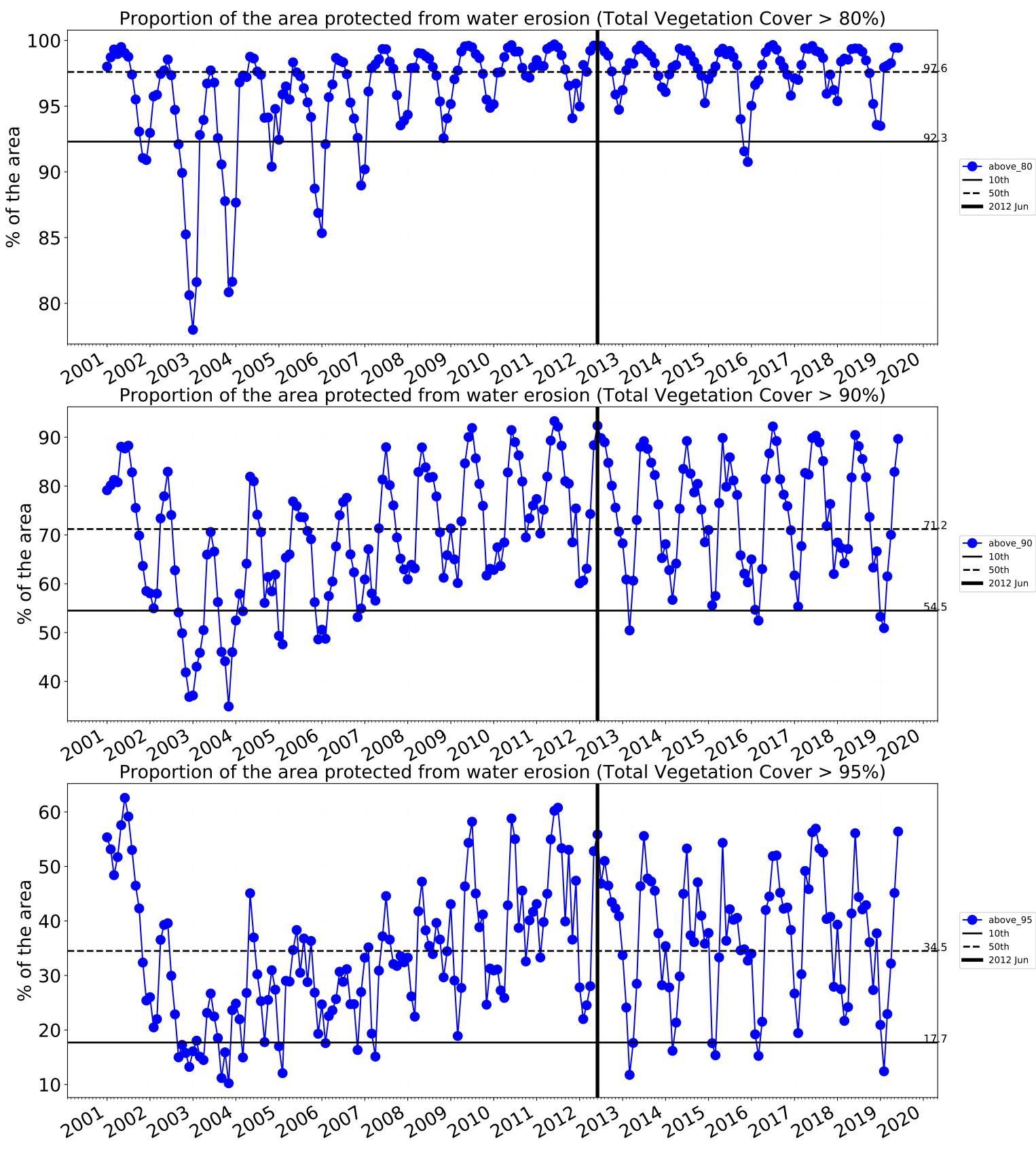


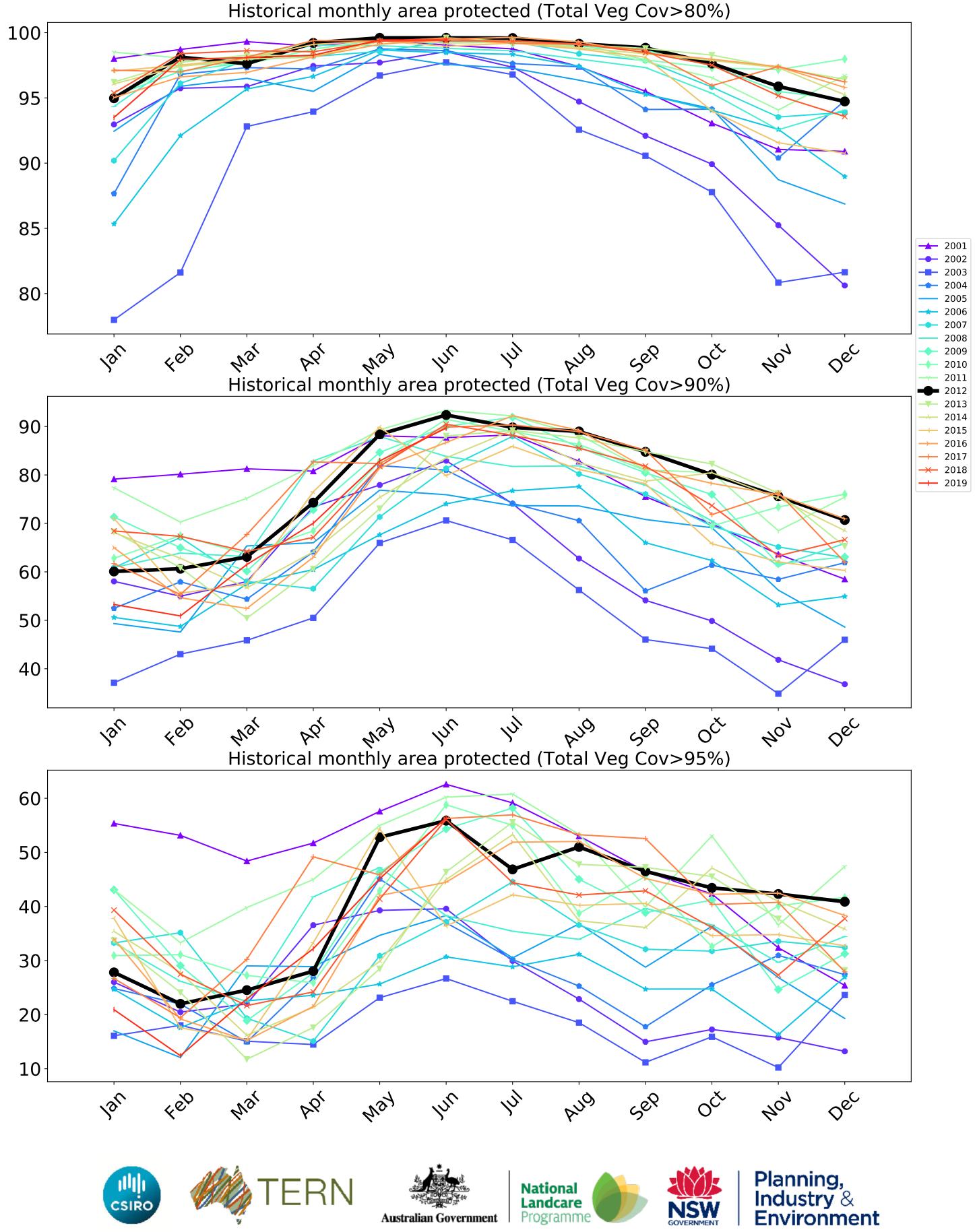


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



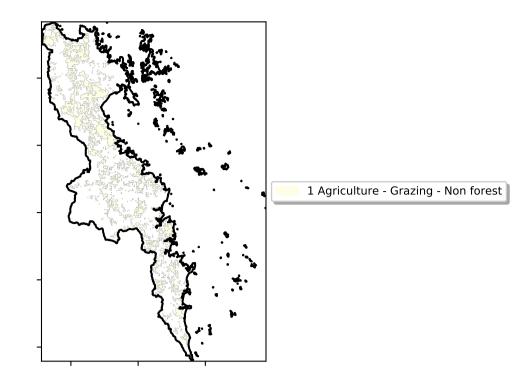




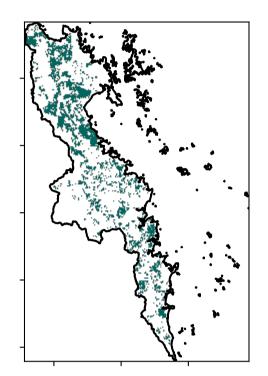
Australian Government

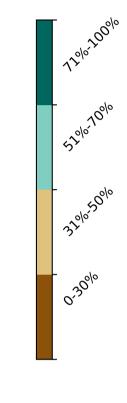
Grazing non forest

Land use and forest cover

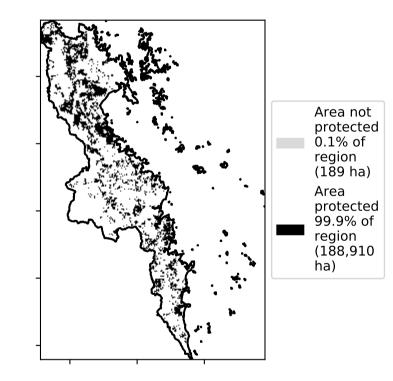


Total Vegetation Cover [%]

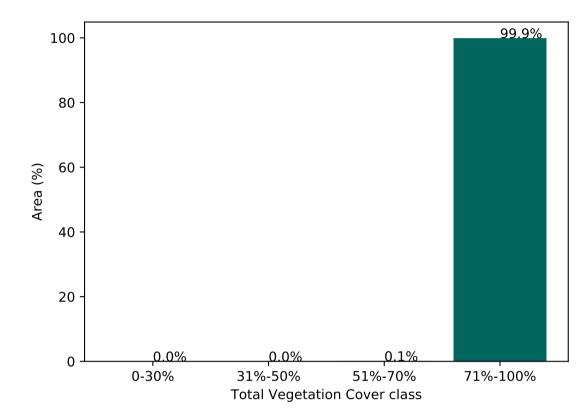




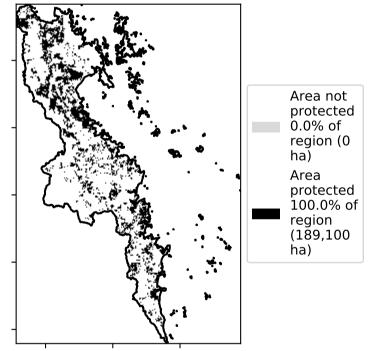
% Area protected from water erosion (>70%)



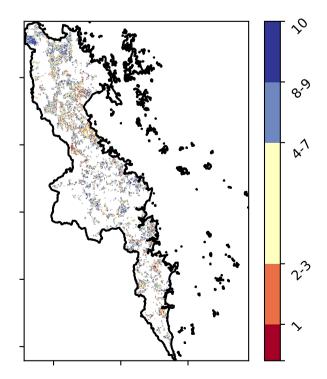




% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]



Total Vegetation Cover Anomaly [%]

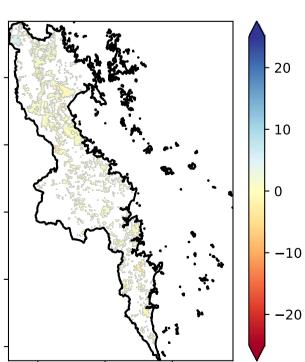
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

Catchment Scale Land Use and Forests of Australia (2018)

Catchment Scale Land

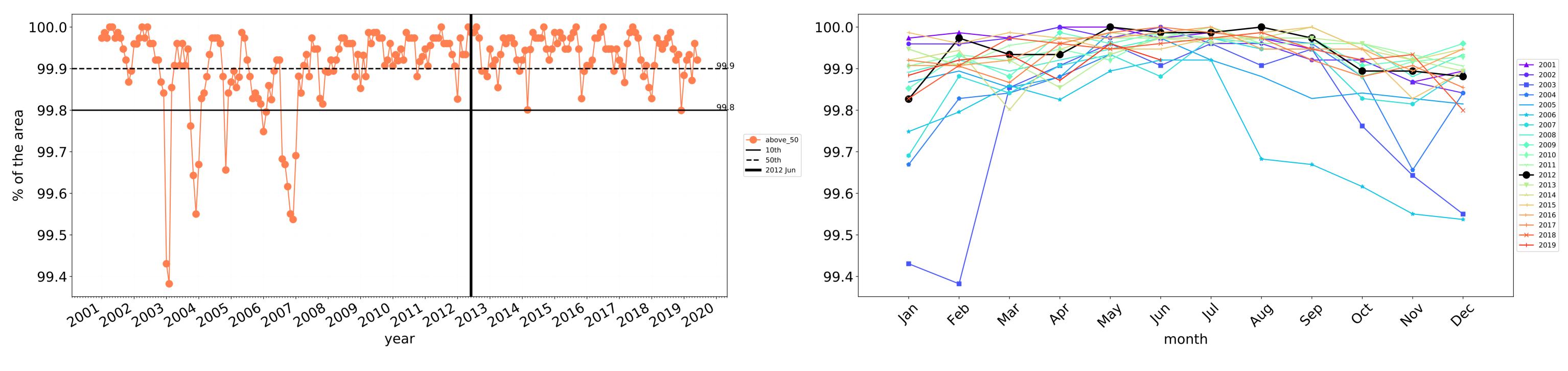
Derived from

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



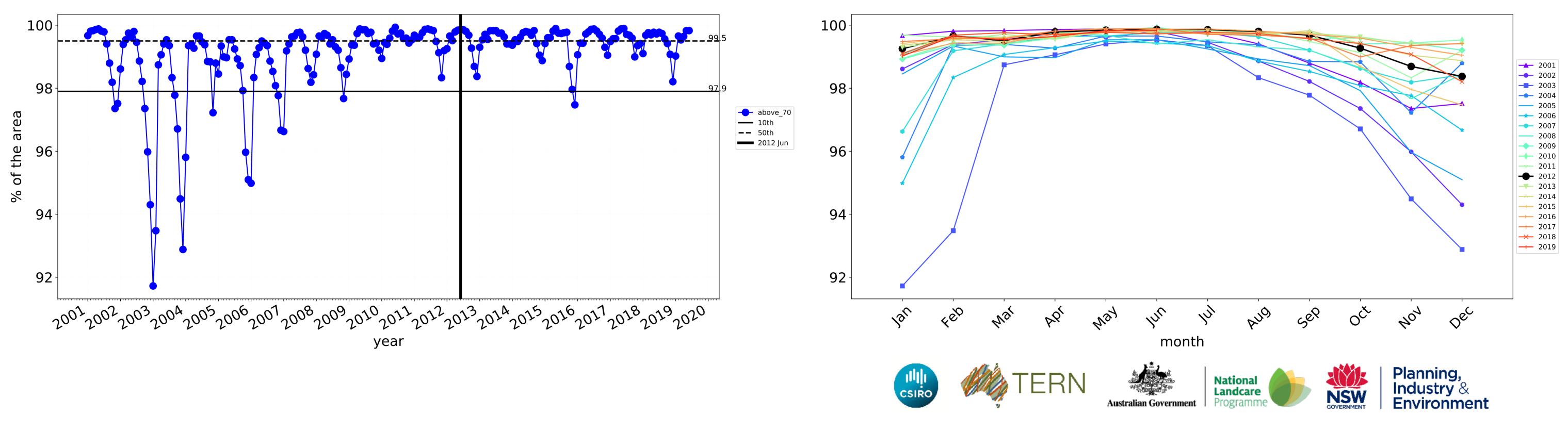
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



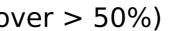


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

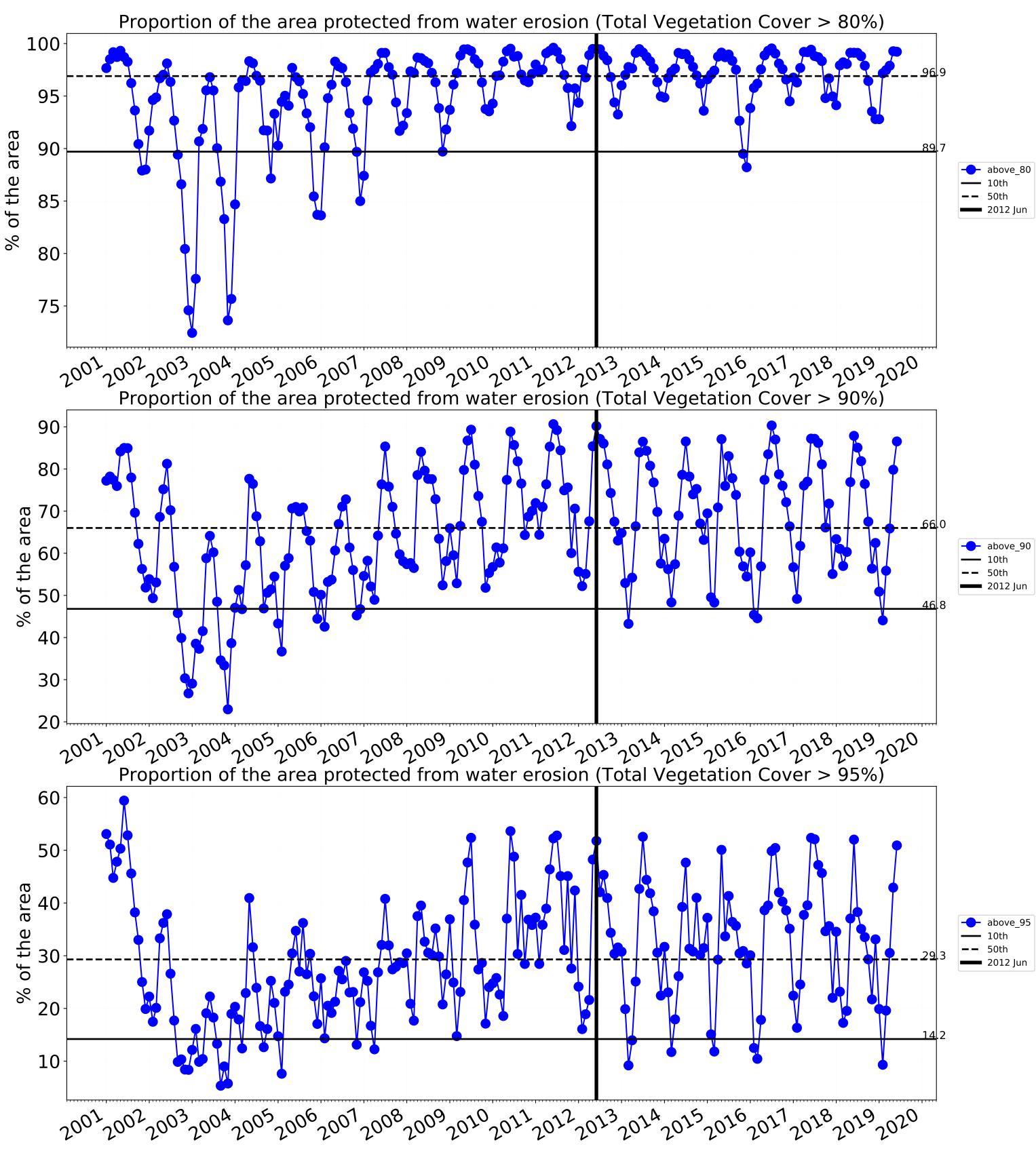


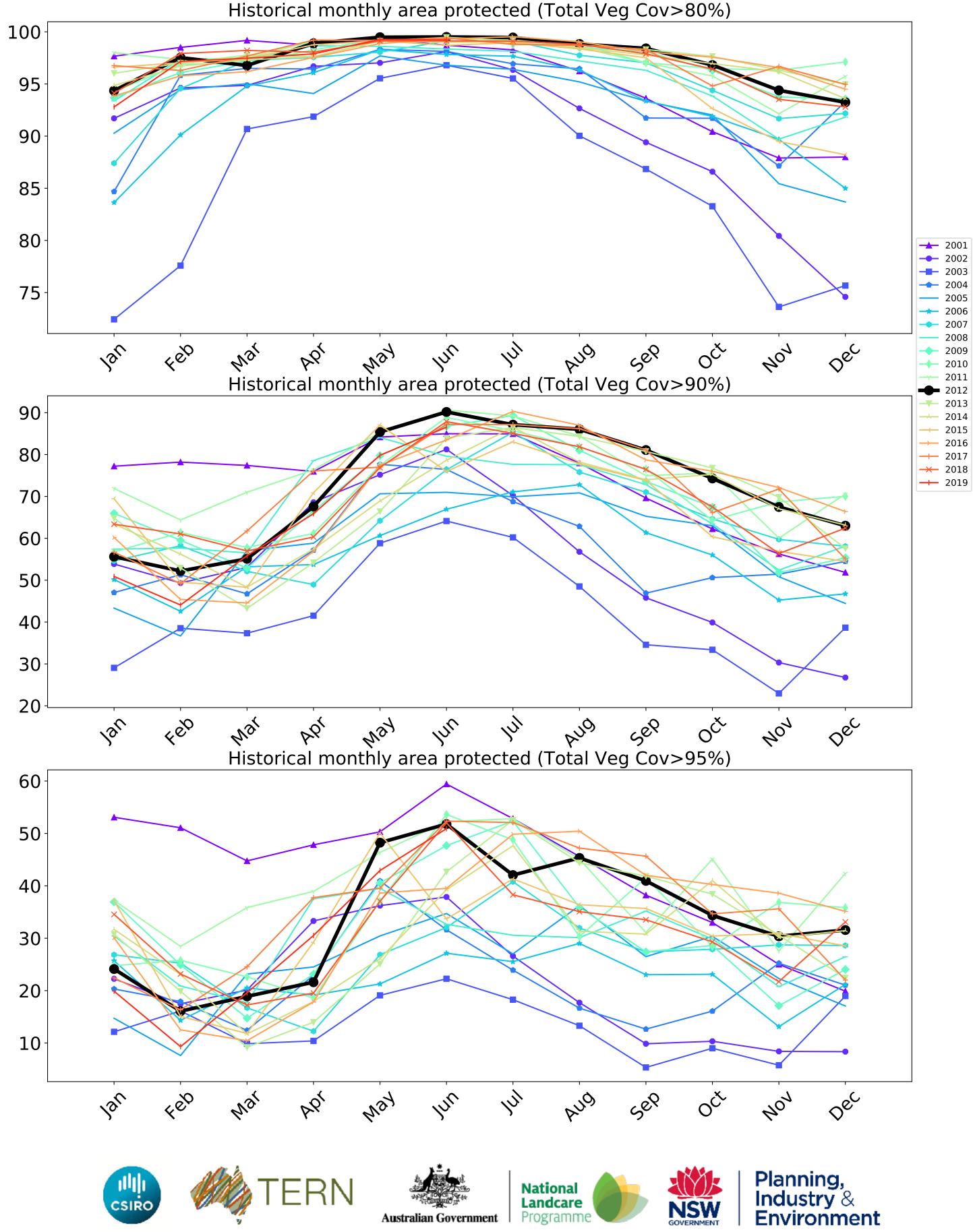
Grazing non forest timeseries



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

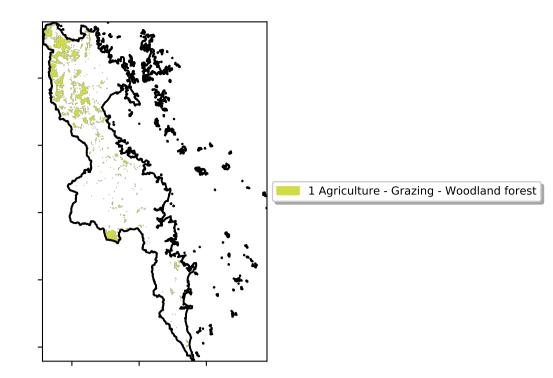
Water erosion historical monthly area protected (Total Veg Cov>70%)



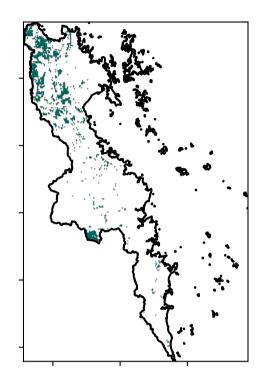


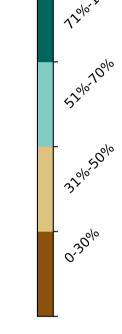
Grazing Woodland forest

Land use and forest cover



Total Vegetation Cover [%]





Area

protected 100.0% of

region (80,575 ha)

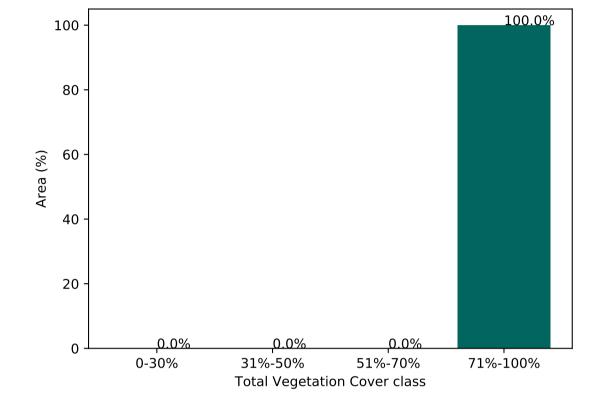
% Area protected from water erosion (>70%)

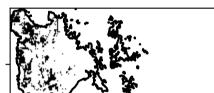




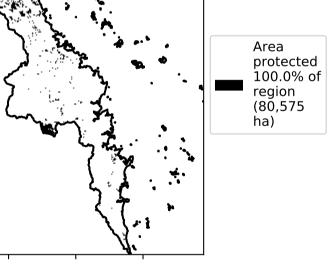




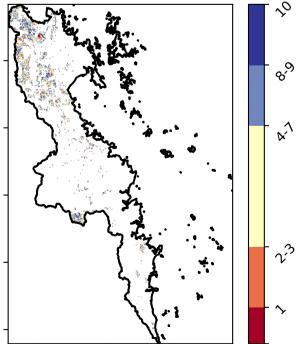


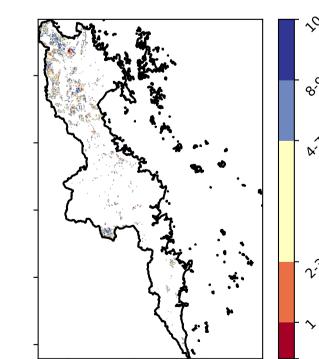


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



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

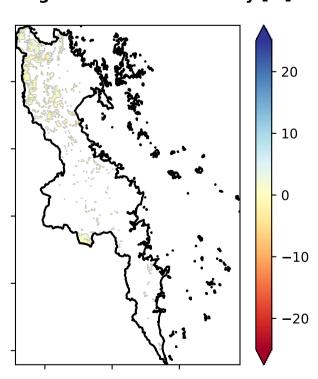
in the lowest 10% of

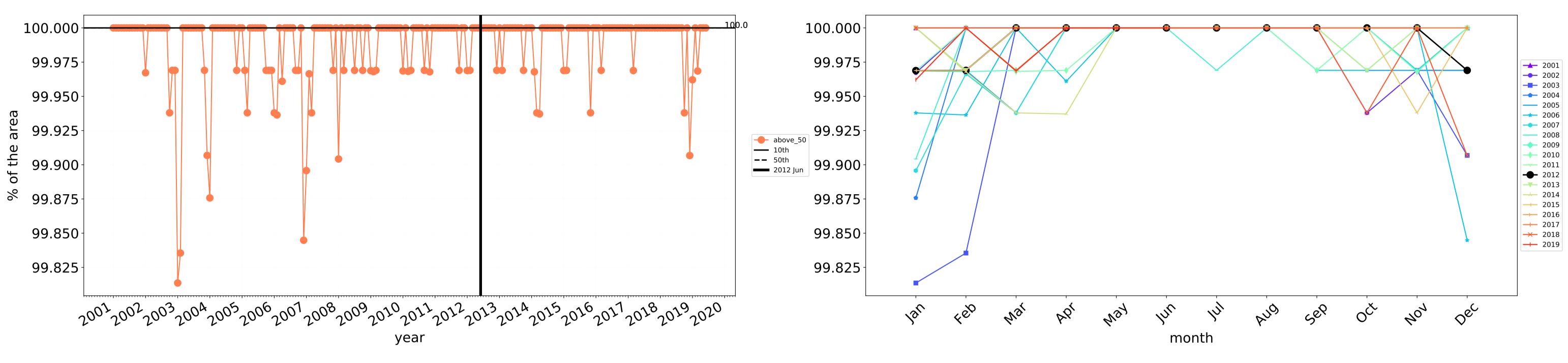
records for that month of

the map using baseline from 2001 to 2019.



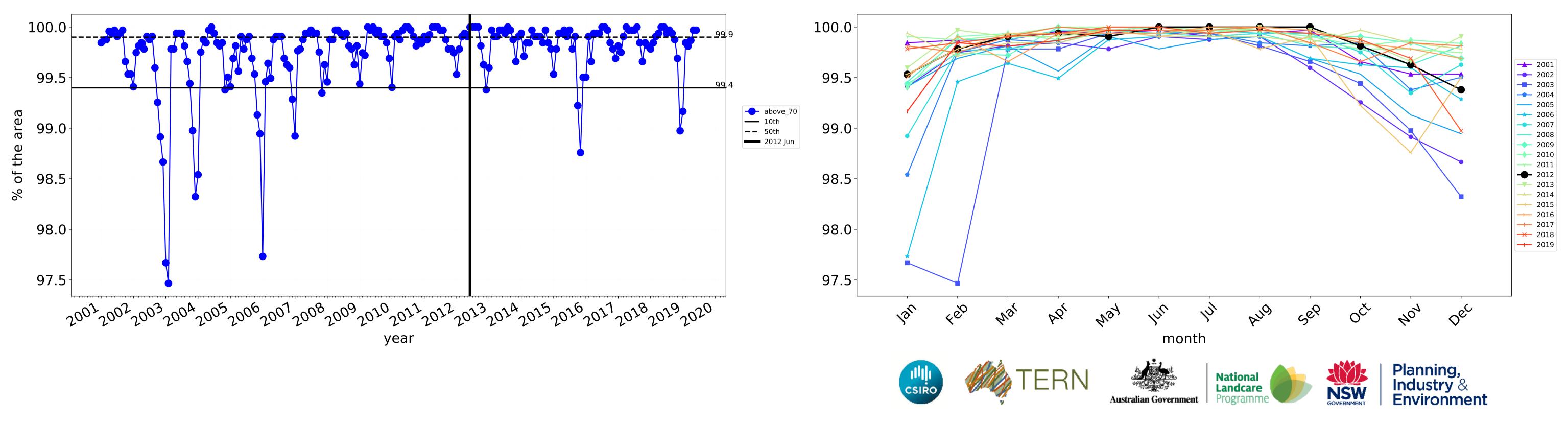
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.





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

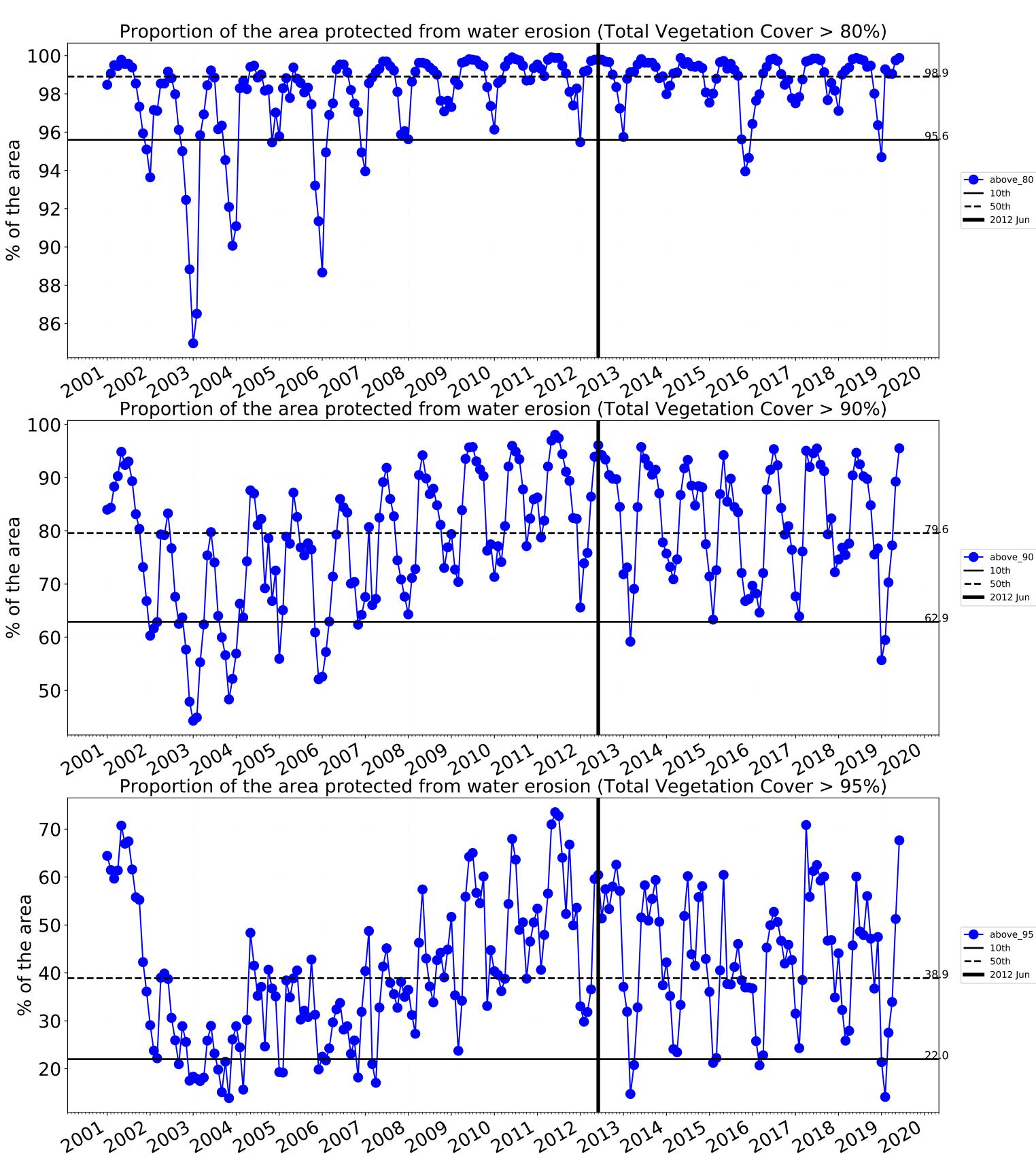
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

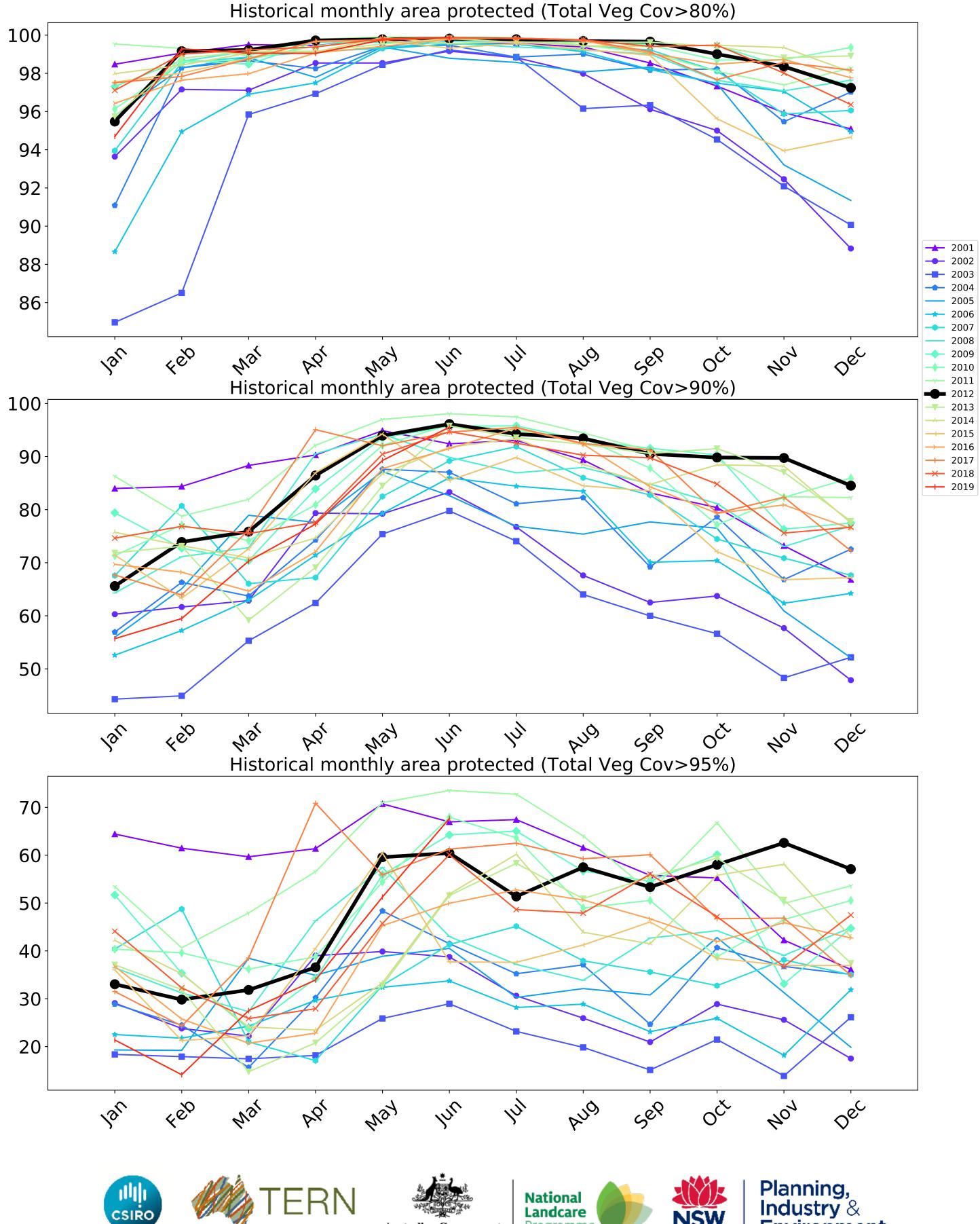




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



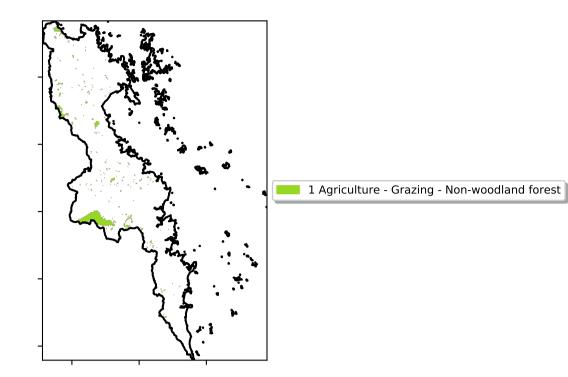


Australian Government

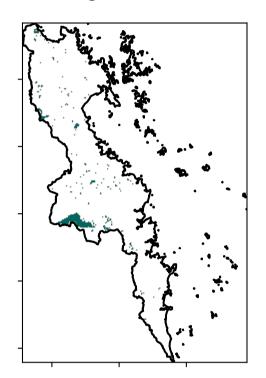


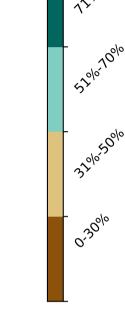
Grazing - Forest (non woodland)

Land use and forest cover

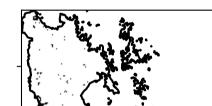


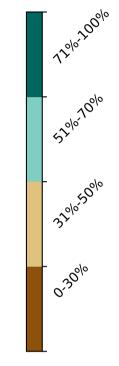
Total Vegetation Cover [%]

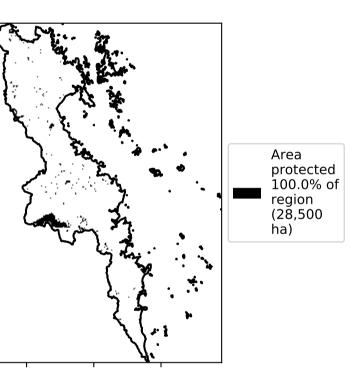




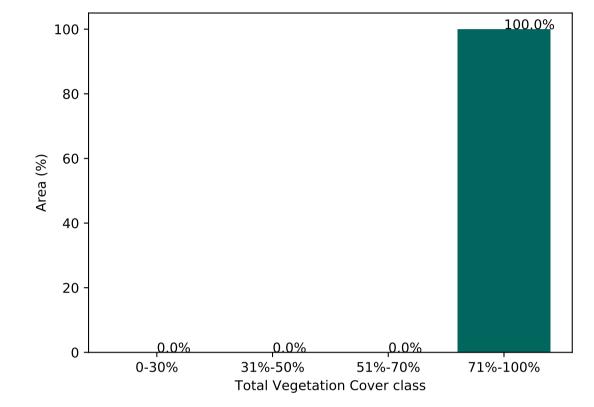
% Area protected from water erosion (>70%)







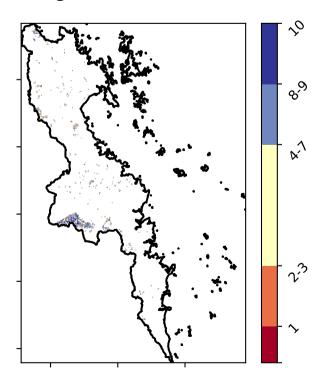
Proportion of vegetation cover class in area

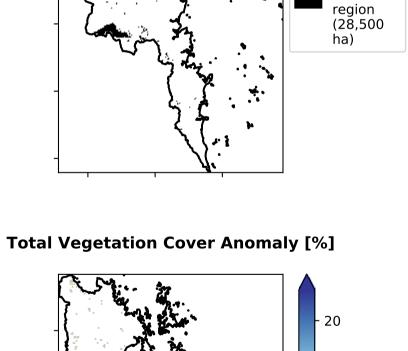


% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]

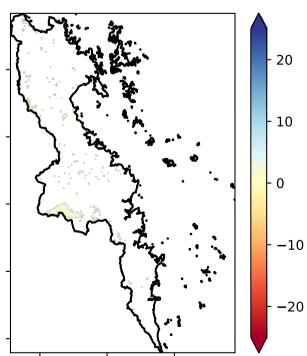




Area

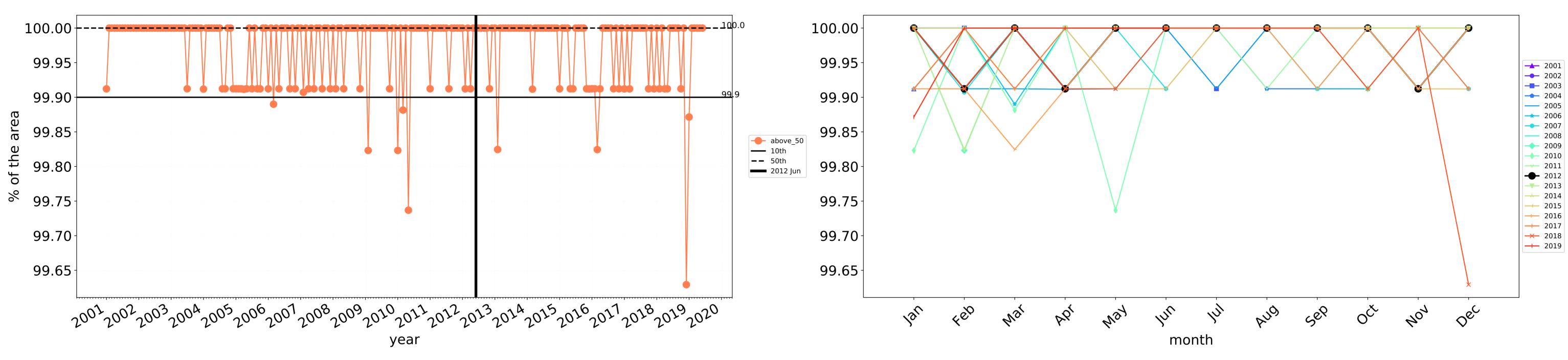
protected 100.0% of

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.



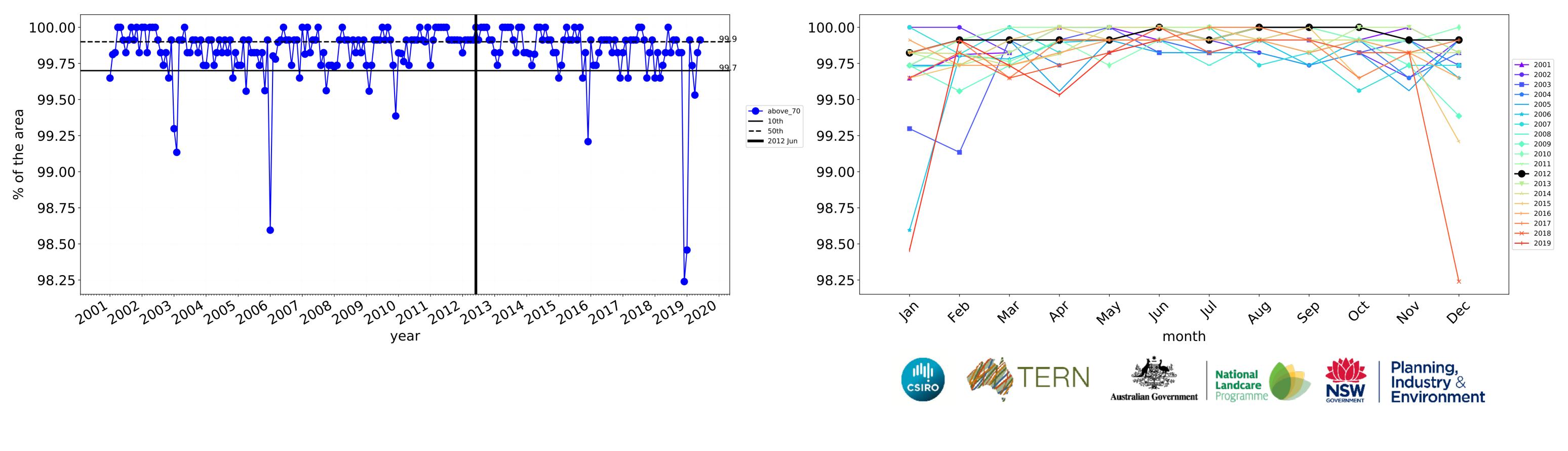
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

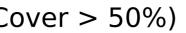




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

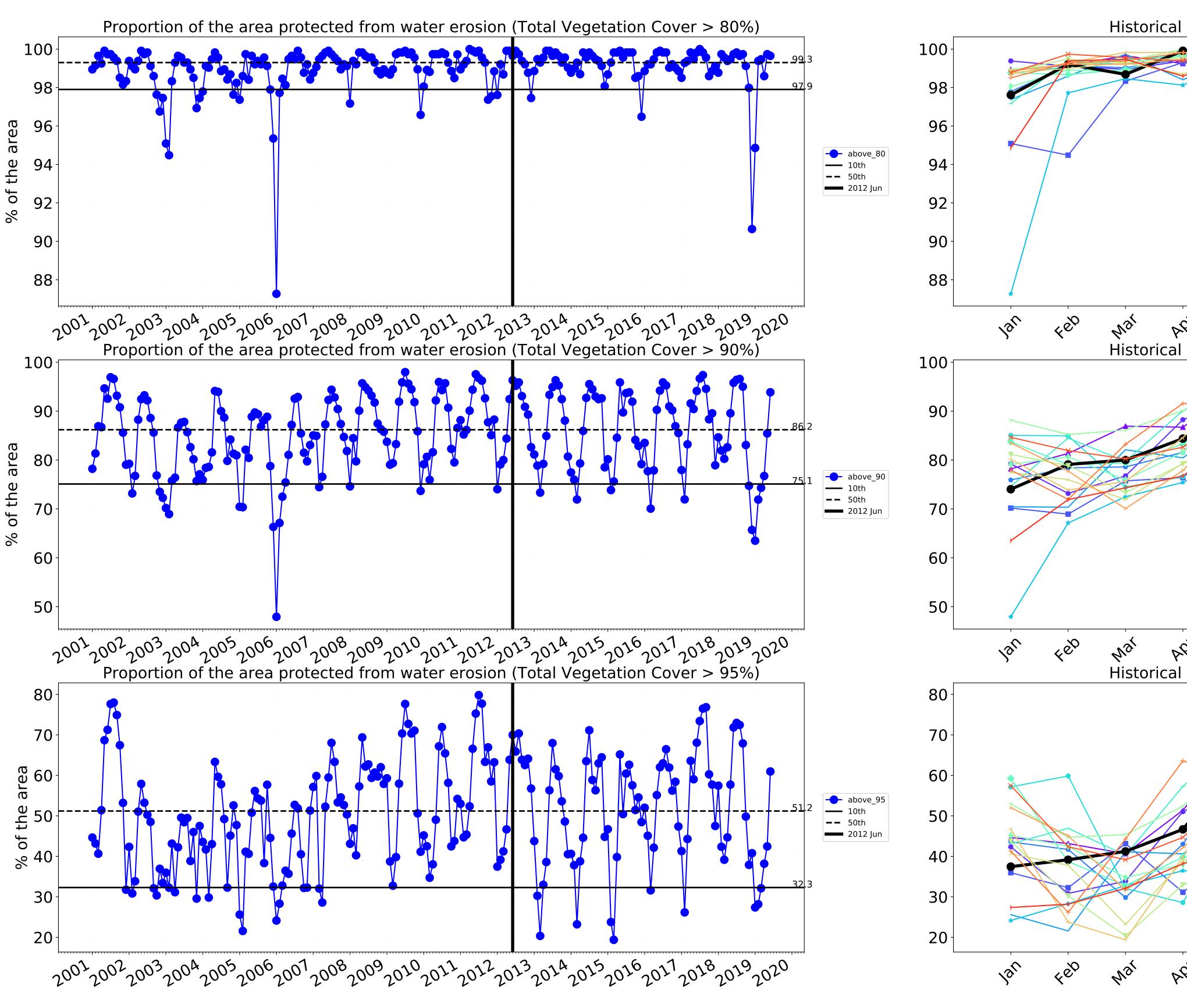
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

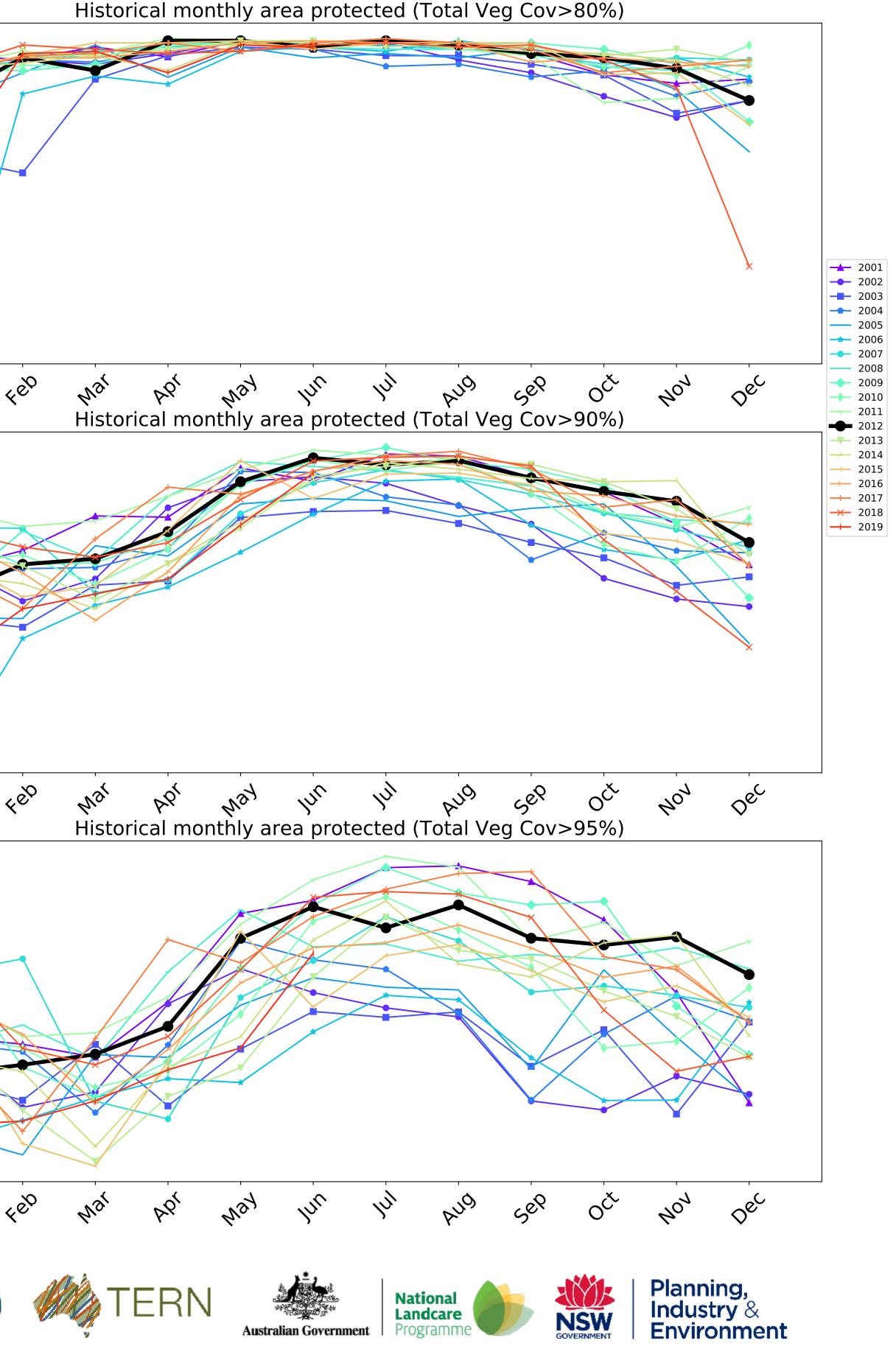




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



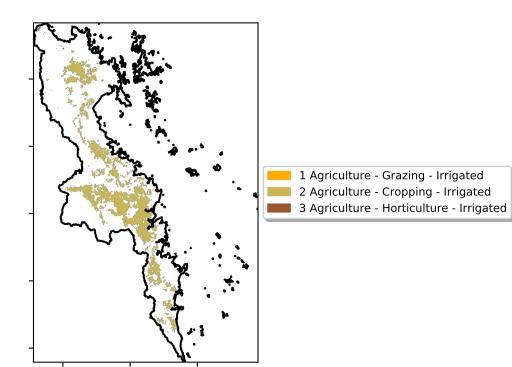


CSIRO

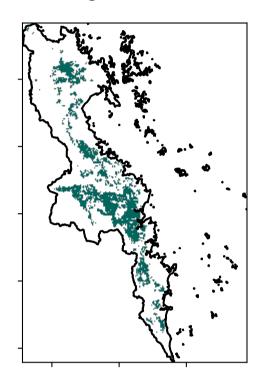
Irrigation

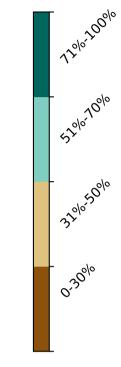
Land use and forest cover

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

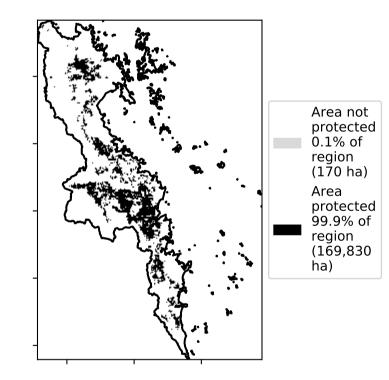


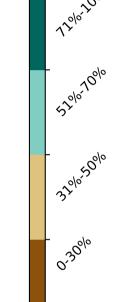
Total Vegetation Cover [%]



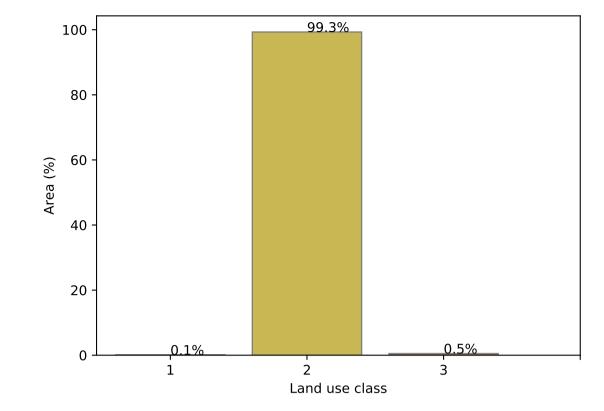


% Area protected from water erosion (>70%)



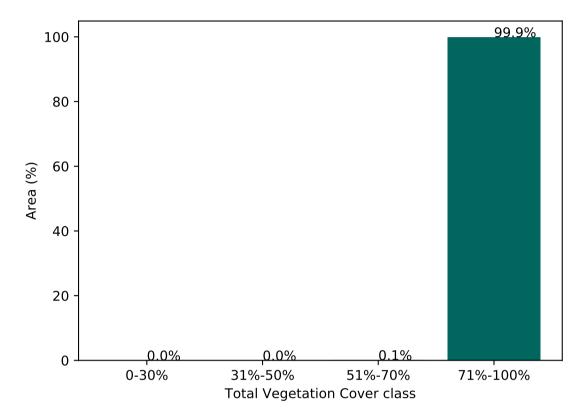




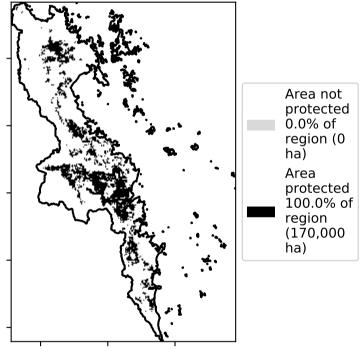


Proportion of each land class in area

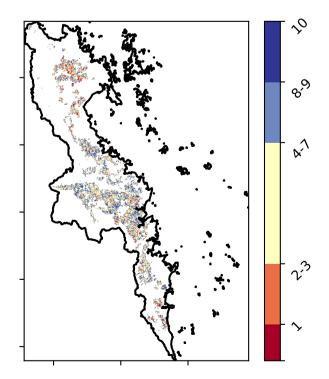
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

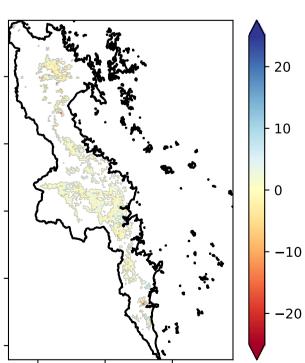


Total Vegetation Cover Decile [%]



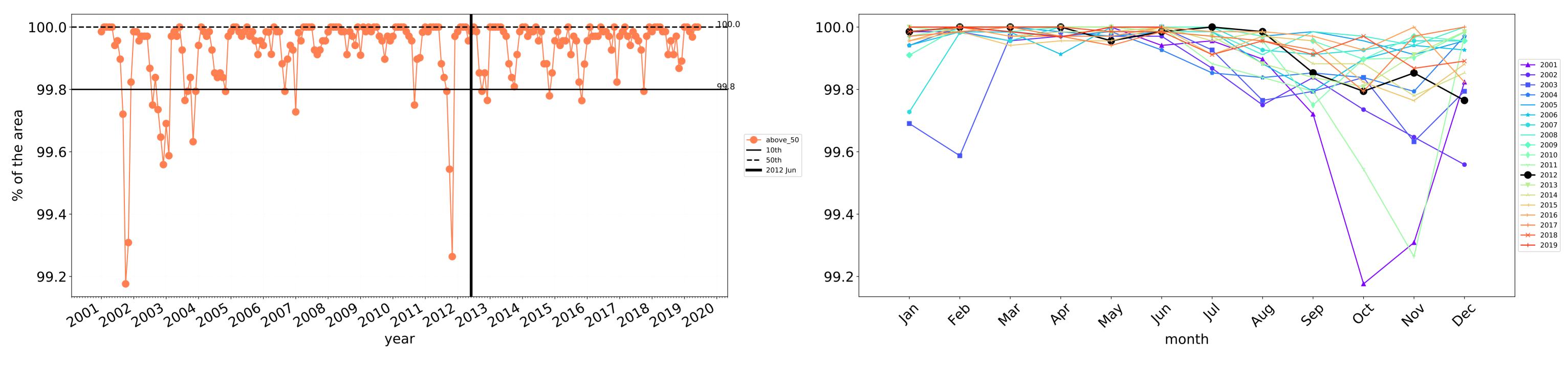
Total Vegetation Cover Anomaly [%]

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.



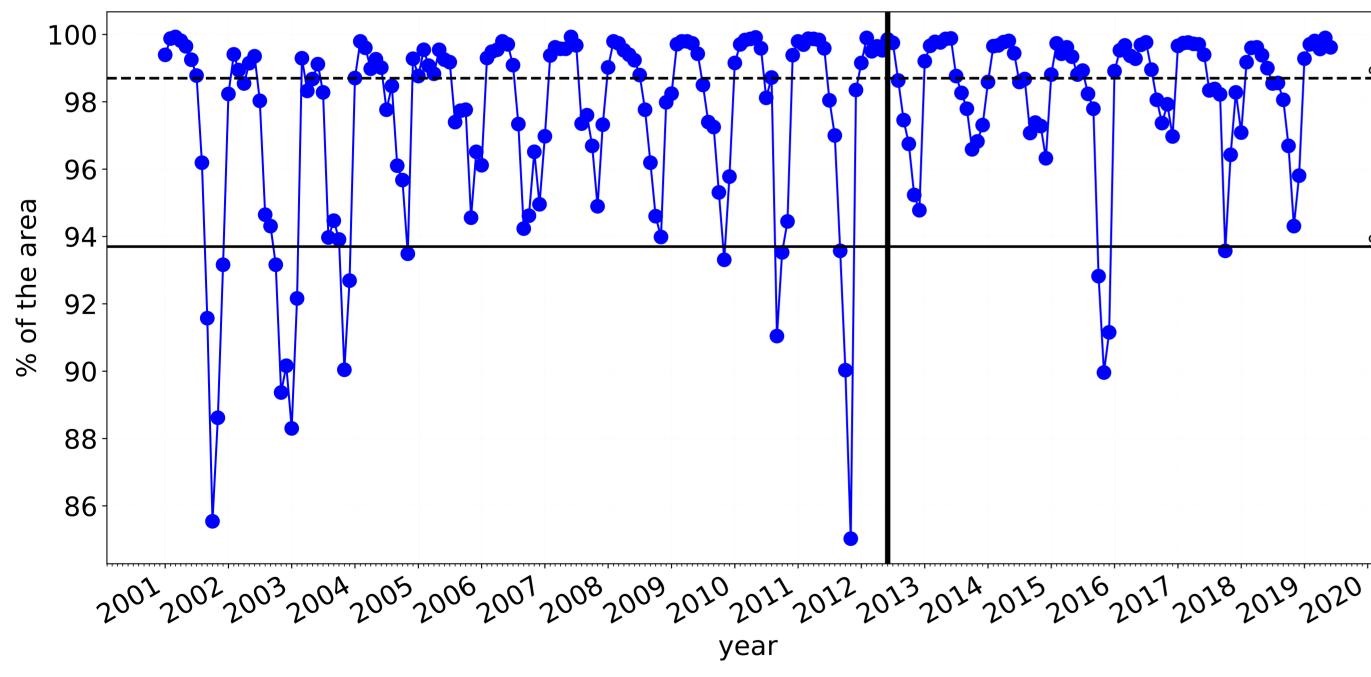
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





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

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



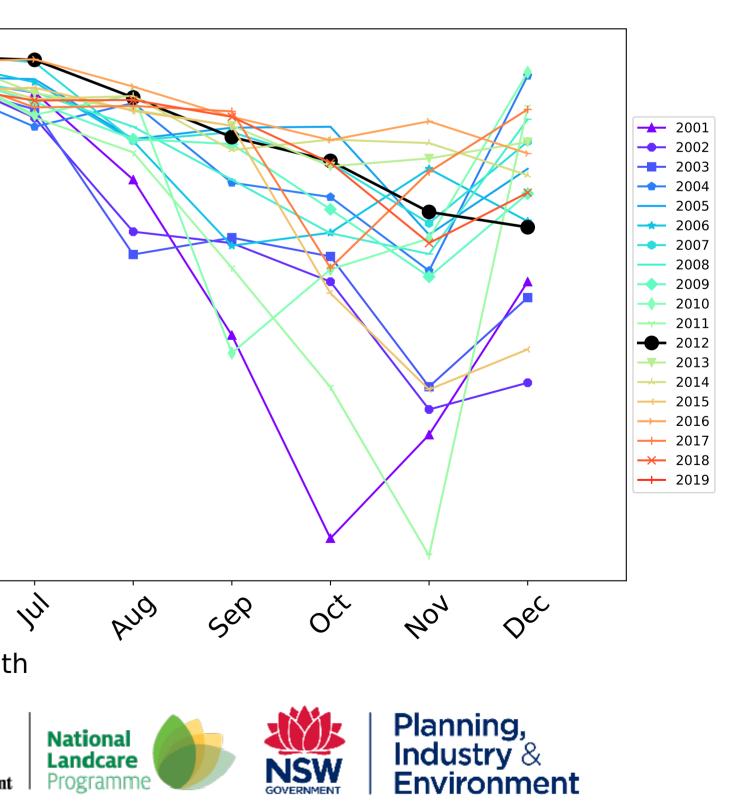
Wind erosion historical monthly area protected (Total Veg Cov >50%)

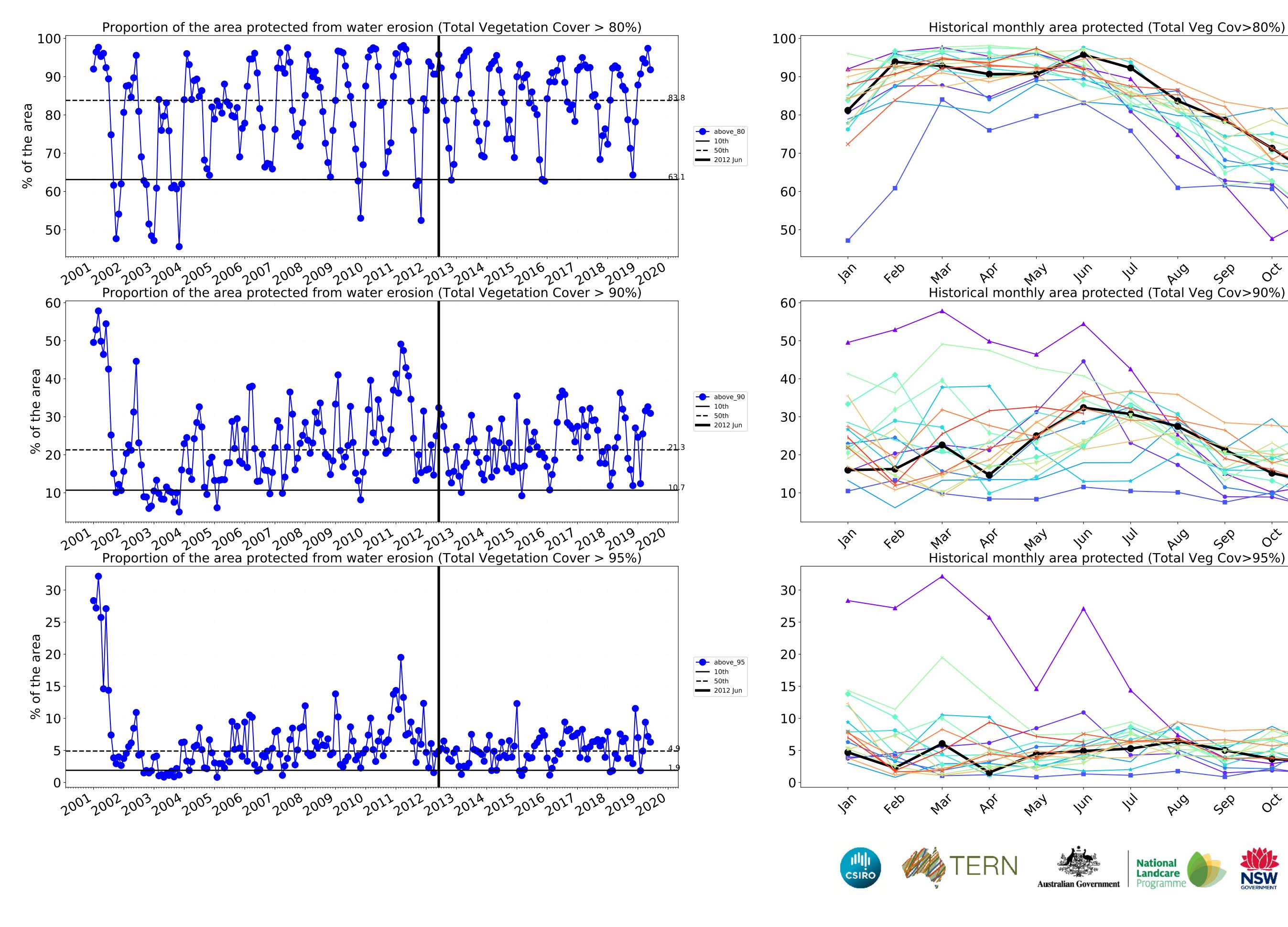
100-98 96 ---- above_70 **—** 10th 94 **——** 50th **——** 2012 Jun 92 90 88 86 feb Par way PP In Mar month FERN **HARD** CSIRC Australian Government

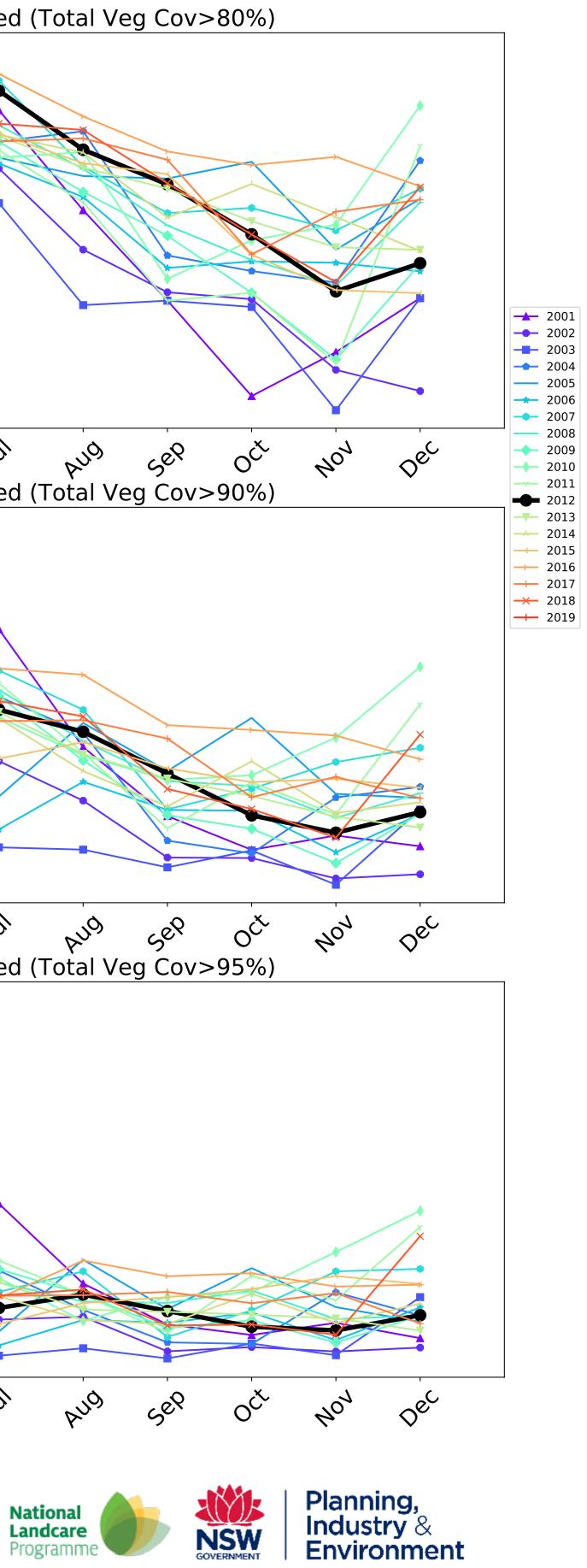
Landcare

Programme

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

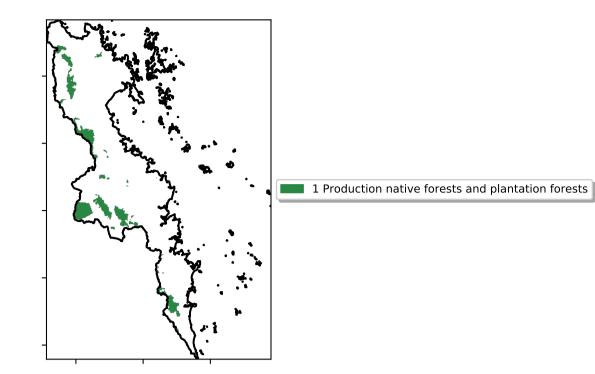




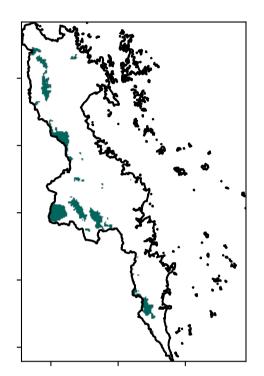


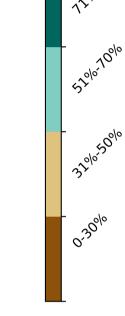
Production native forests and plantation forests

Land use and forest cover

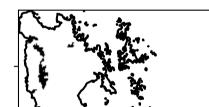


Total Vegetation Cover [%]



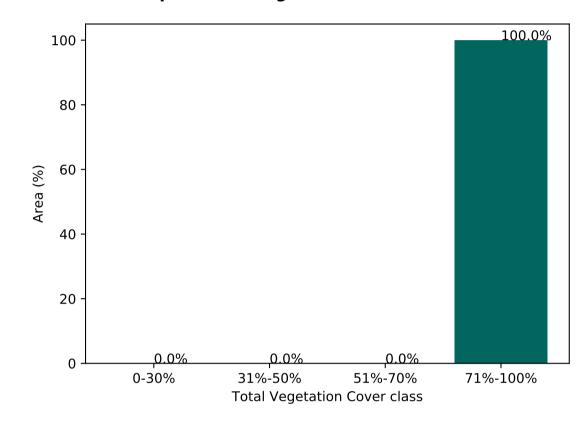


% Area protected from water erosion (>70%)

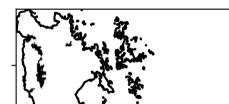




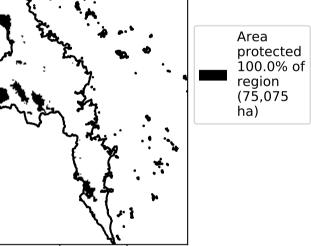
Proportion of vegetation cover class in area



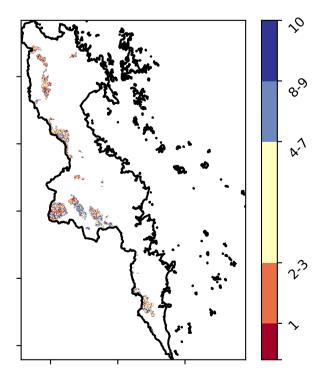
% Area protected from wind erosion (>50%)

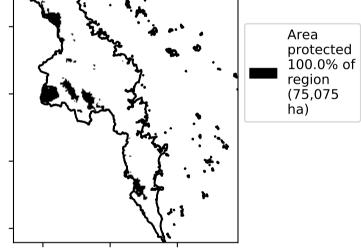


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



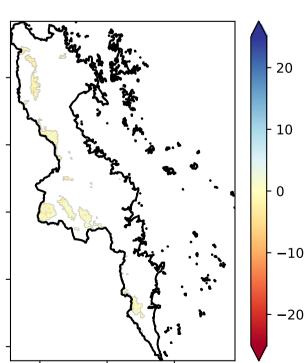
Total Vegetation Cover Decile [%]





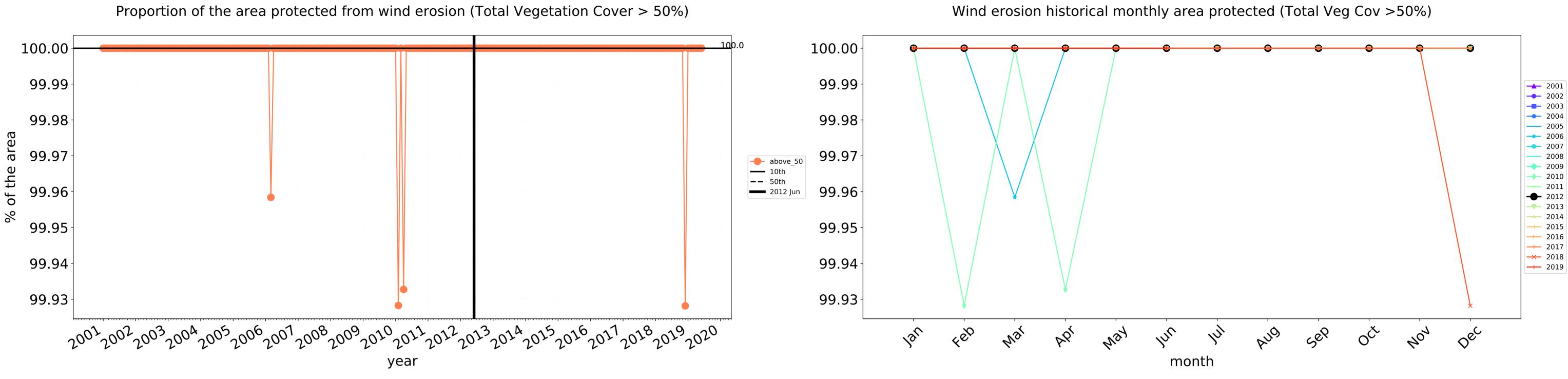
Total Vegetation Cover Anomaly [%]

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.

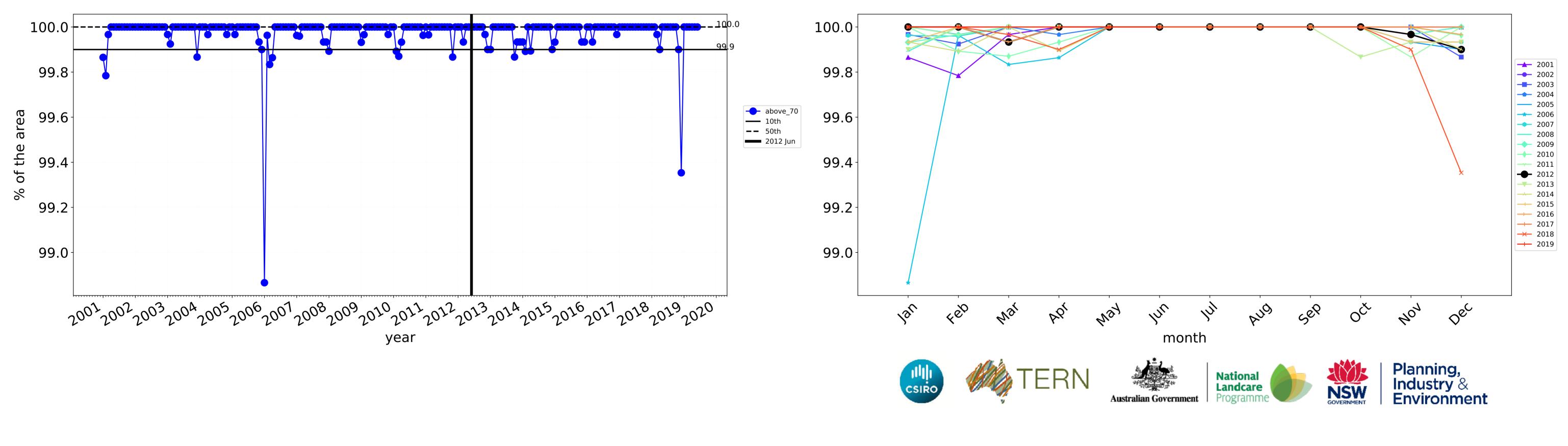


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

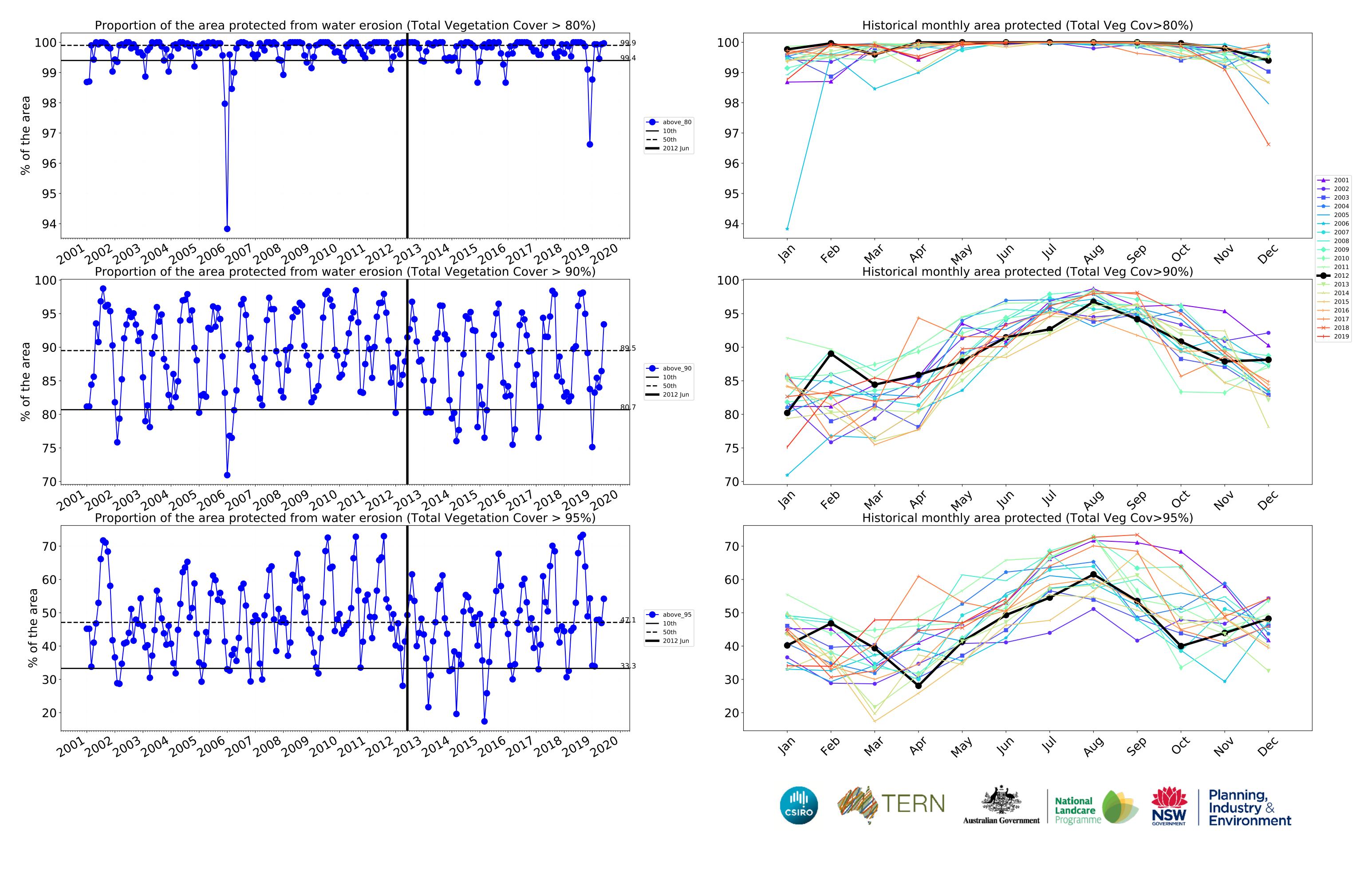




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



Mackay Whitsunday (907,525 ha and no data 25,535 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	907,525	100.0% 907,199	99.8% 906,073	99.1% 899,665	96.7% 877,414	73.3% 665,288	36.7% 333,094
Conservation and natural environments	274,475	99.9% 274,275	99.7% 273,700	98.8% 271,175	97.2% 266,700	82.4% 226,200	39.6% 108,750
Conservation and natural environments non forest	6,925	99.6% 6,900	98.9% 6,850	92.4% 6,400	85.2% 5,900	59.9% 4,150	30.3% 2,100
Conservation and natural environments Woodland forest	74,375	100.0% 74,375	99.9% 74,300	99.3% 73,850	97.9% 72,850	88.5% 65,825	50.9% 37,850
Conservation and natural environments Forest (non woodland)	193,175	99.9% 193,000	99.7% 192,550	98.8% 190,925	97.3% 187,950	80.9% 156,225	35.6% 68,800
Agriculture	468,225	100.0% 468,225	100.0% 468,175	99.9% 467,725	98.2% 459,850	70.6% 330,550	37.4% 174,900
Grazing	298,175	100.0% 298,175	100.0% 298,150	99.9% 297,925	99.6% 297,000	92.4% 275,425	55.9% 166,575
Grazing non forest	189,100	100.0% 189,100	100.0% 189,075	99.9% 188,850	99.5% 188,175	90.2% 170,525	51.8% 97,925
Grazing Woodland forest	80,575	100.0% 80,575	100.0% 80,575	100.0% 80,575	99.8% 80,425	96.1% 77,450	60.4% 48,700
Grazing - Forest (non woodland)	28,500	100.0% 28,500	100.0% 28,500	100.0% 28,500	99.6% 28,400	96.3% 27,450	70.0% 19,950
Irrigation	170,000	100.0% 170,000	100.0% 169,975	99.9% 169,750	95.8% 162,800	32.4% 55,075	4.9% 8,325
Production native forests and plantation forests	75,075	100.0% 75,075	100.0% 75,075	100.0% 75,075	100.0% 75,075	91.5% 68,675	49.3% 37,025

