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

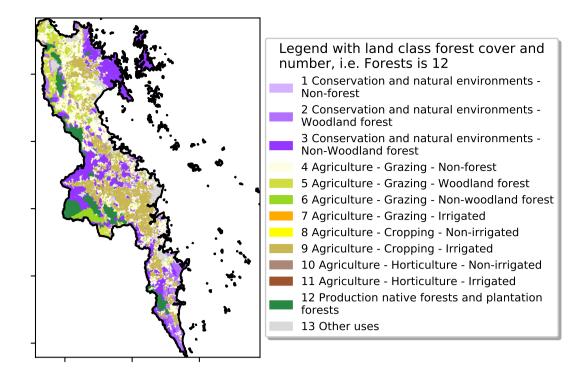


Vegetation Cover Aug 2002

Land use and forest cover

Proportion of each land class in area





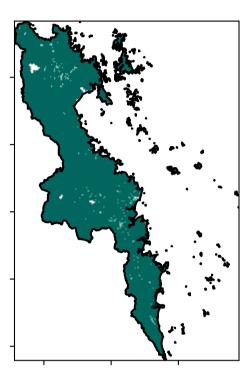
120102100%

5200070010

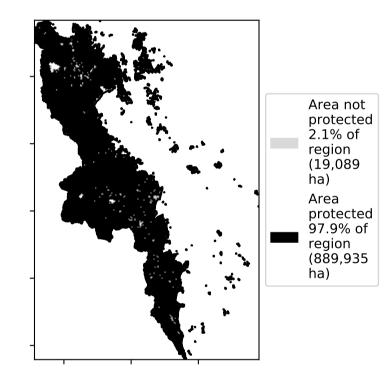
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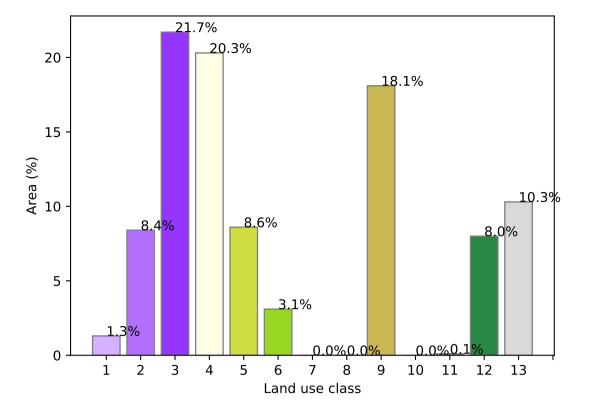
0-30%

Total Vegetation Cover [%]

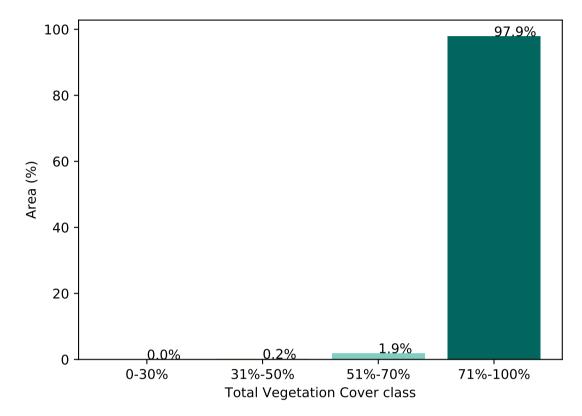


% Area protected from water erosion (>70%)

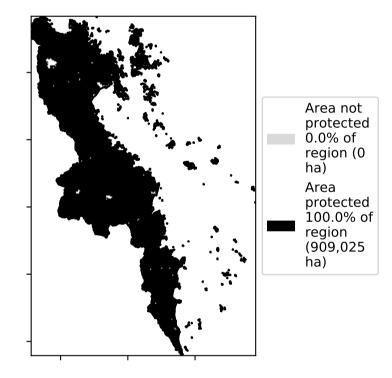




Proportion of vegetation cover class in area

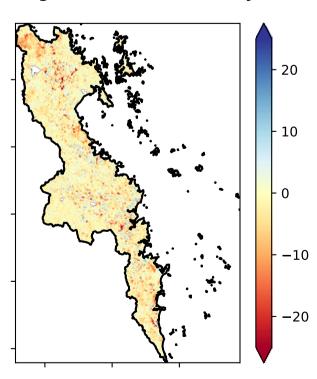


% Area protected from wind erosion (>50%)

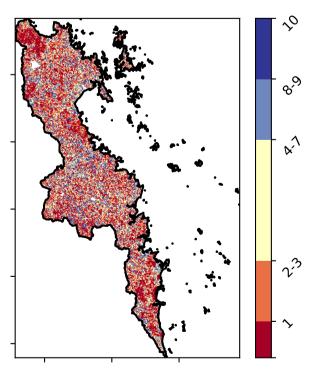


Total Vegetation Cover Anomaly [%]

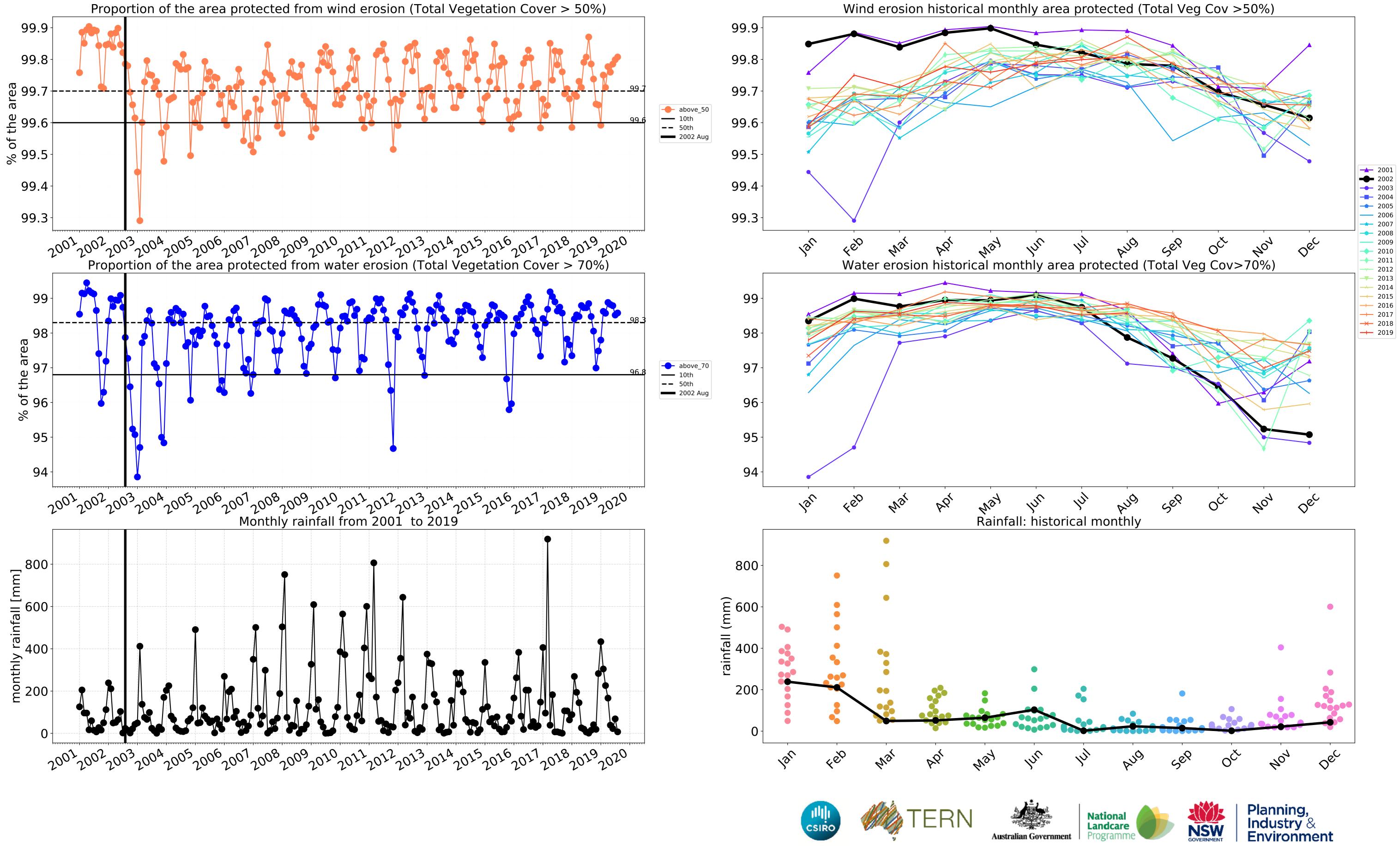
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



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



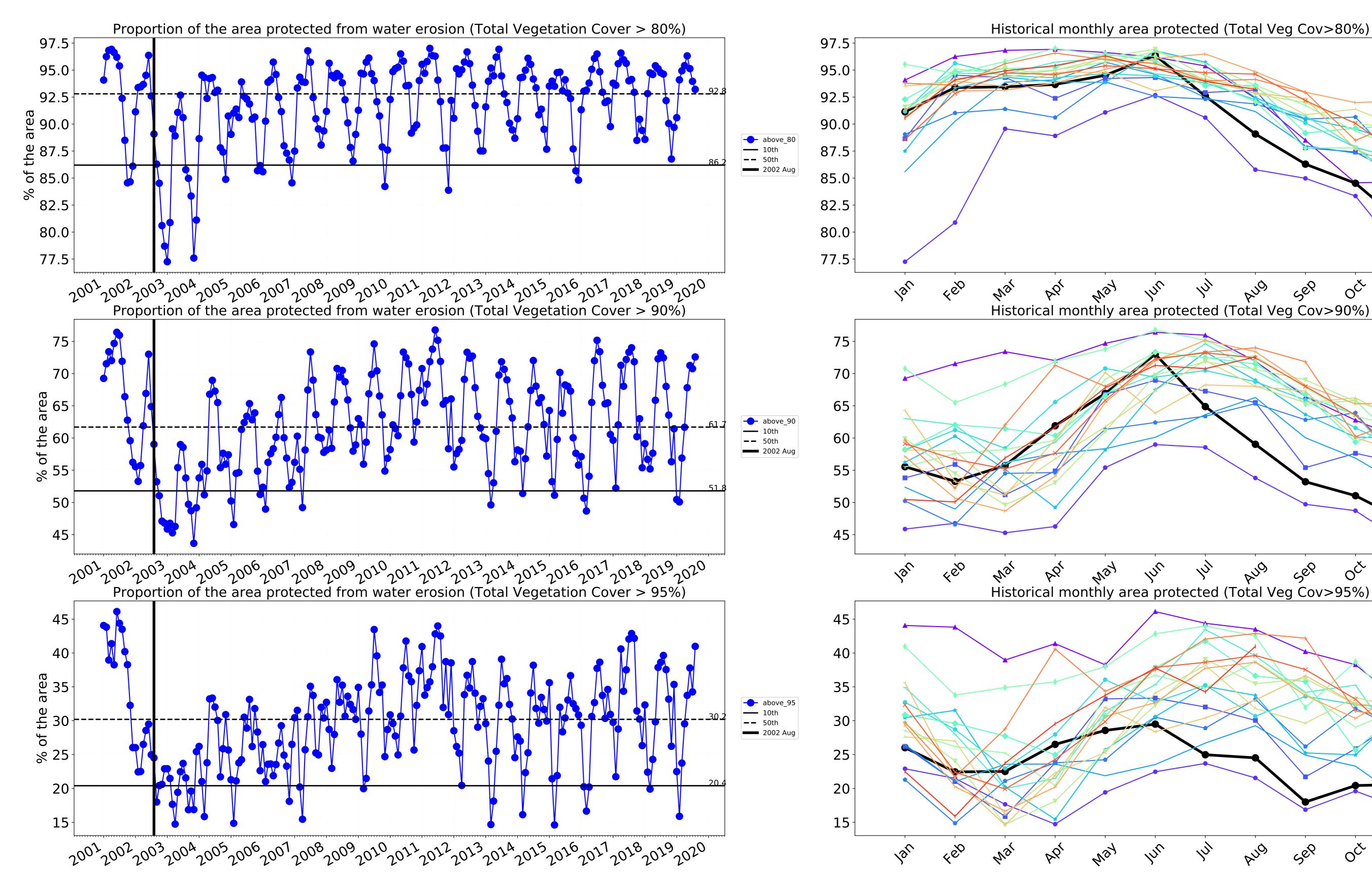




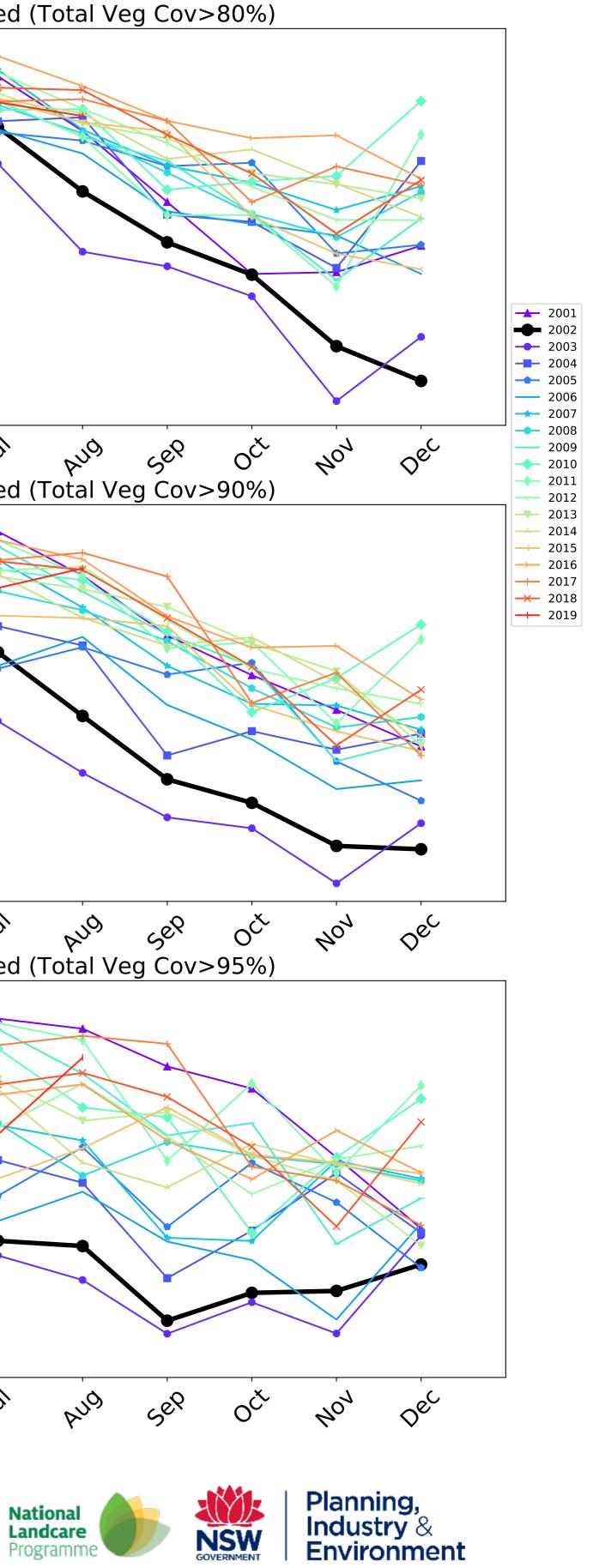
3

Australian Government

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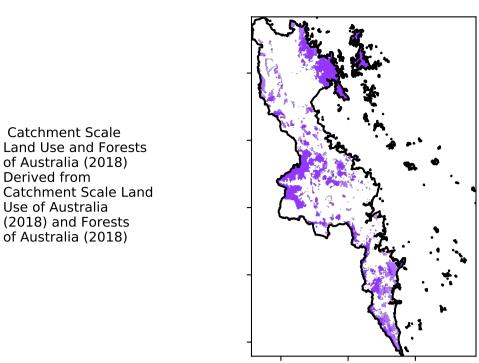




Conservation and natural environments

Land use and forest cover

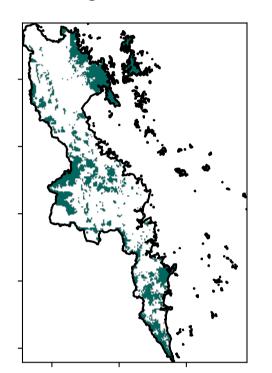
Proportion of each land class in area

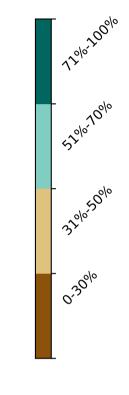


Derived from

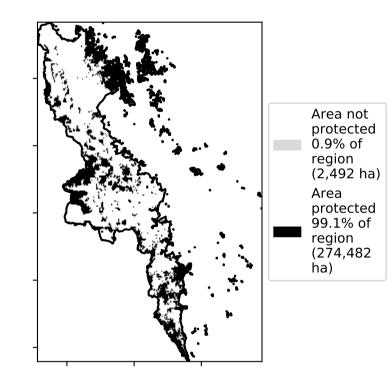
Use of Australia

Total Vegetation Cover [%]

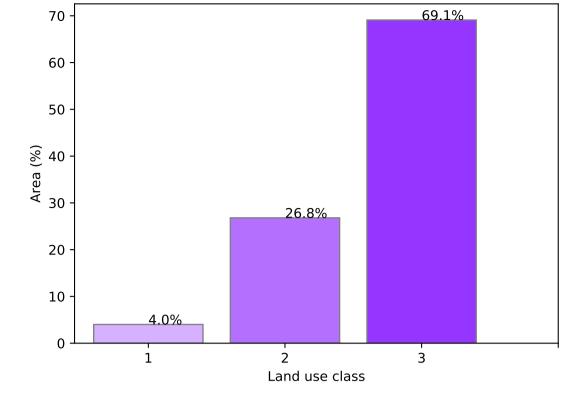




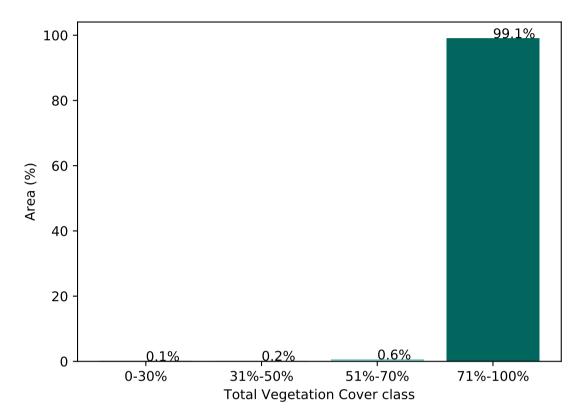
% Area protected from water erosion (>70%)



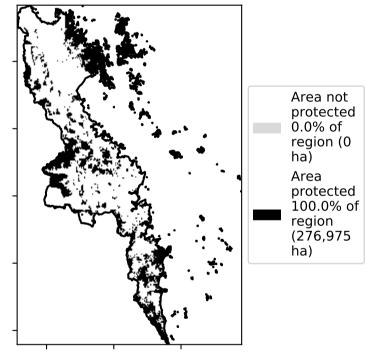


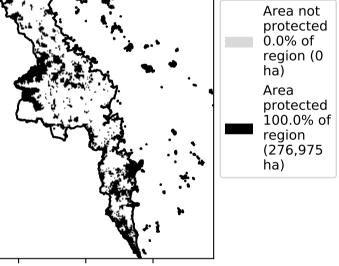


Proportion of vegetation cover class in area

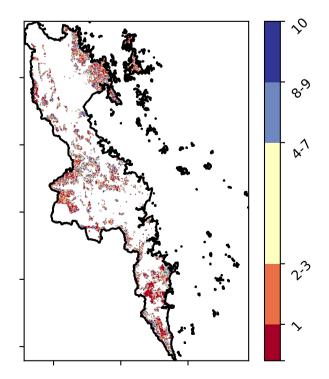


% Area protected from wind erosion (>50%)

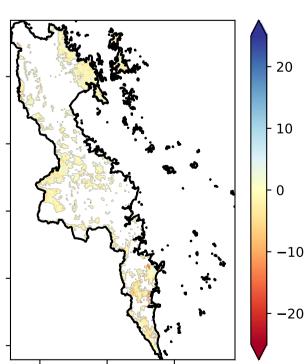




Total Vegetation Cover Decile [%]

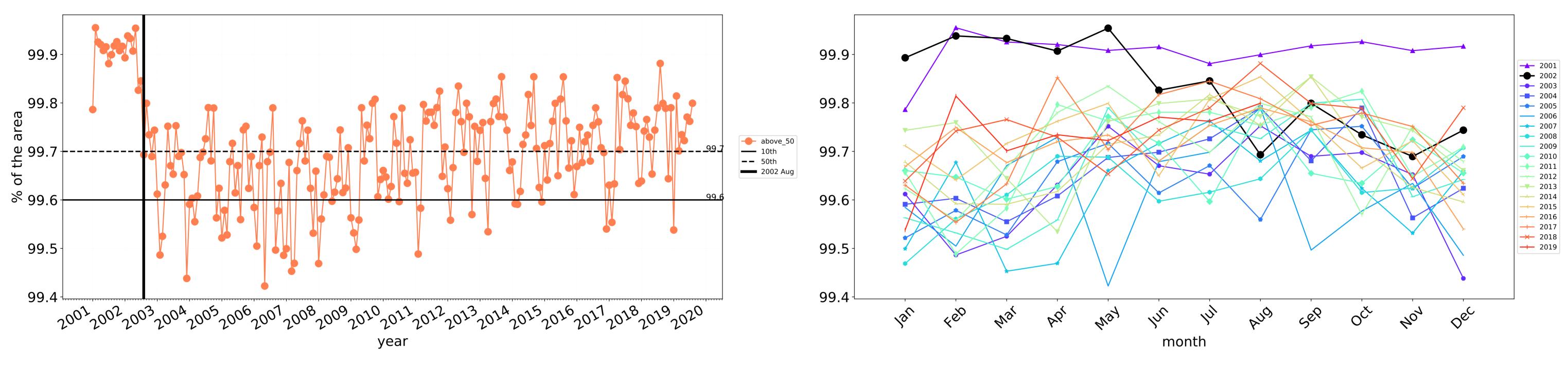


Total Vegetation Cover Anomaly [%]



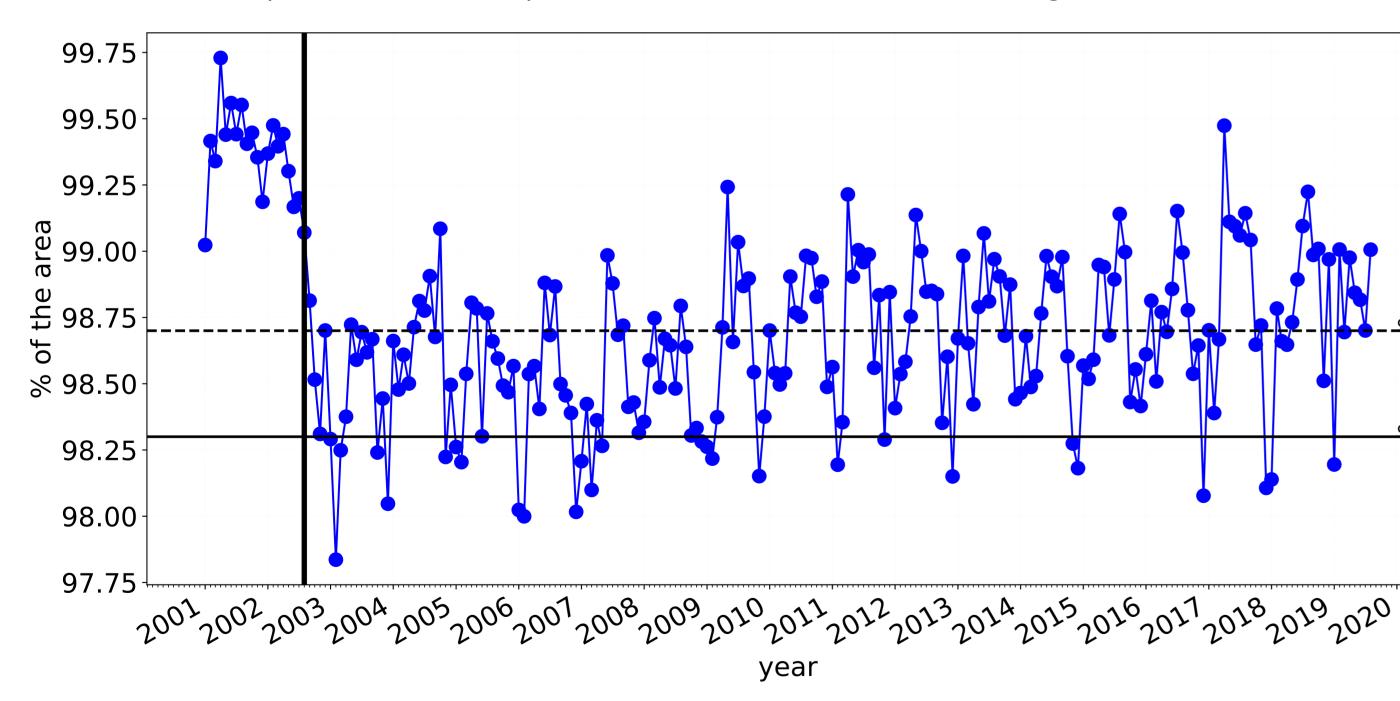
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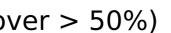


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

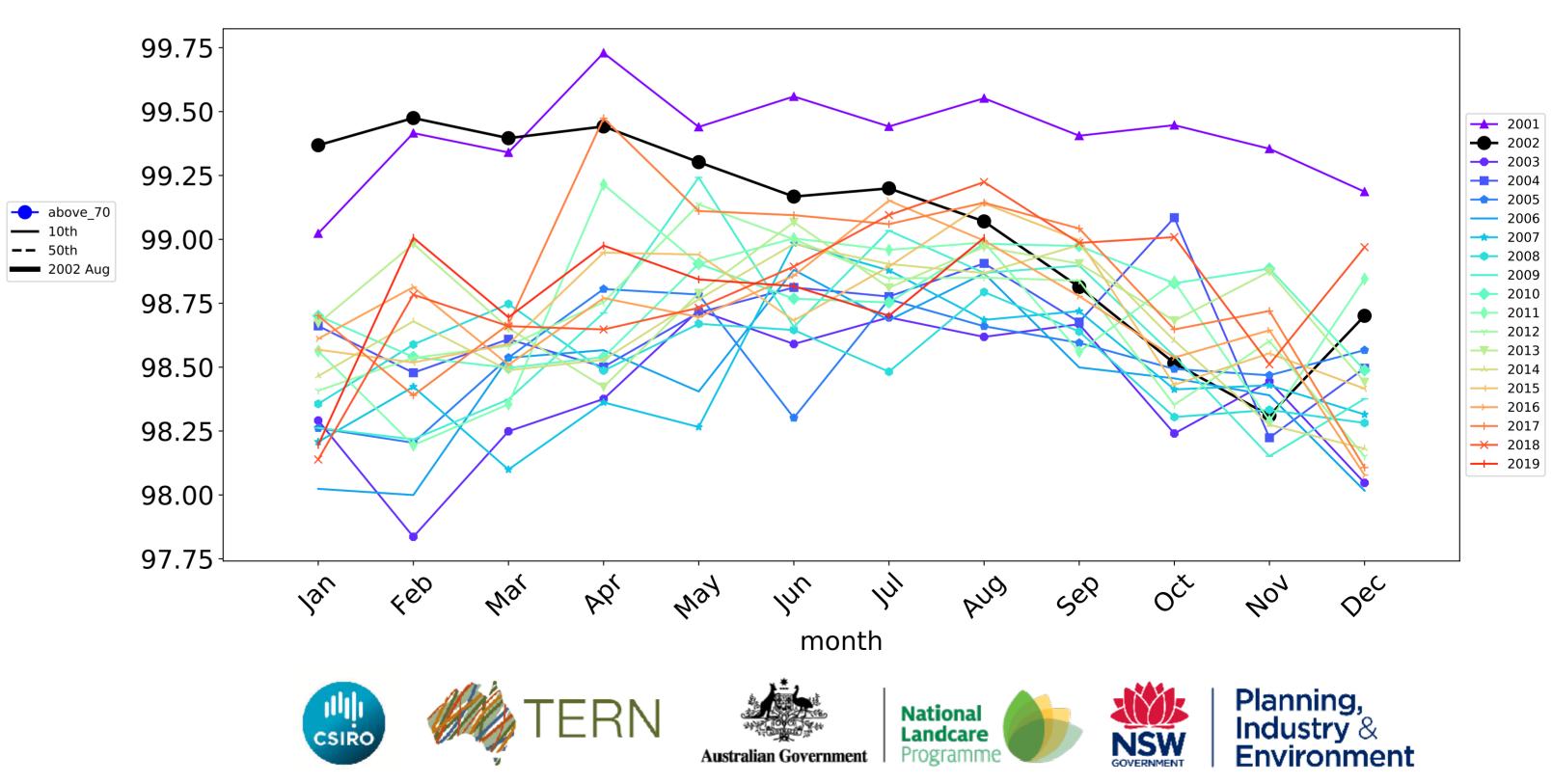
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

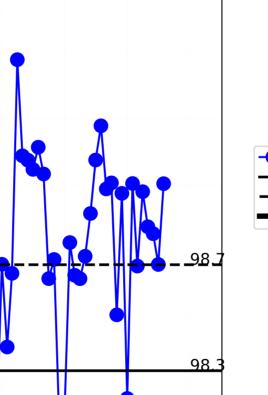


Conservation and natural environments timeseries



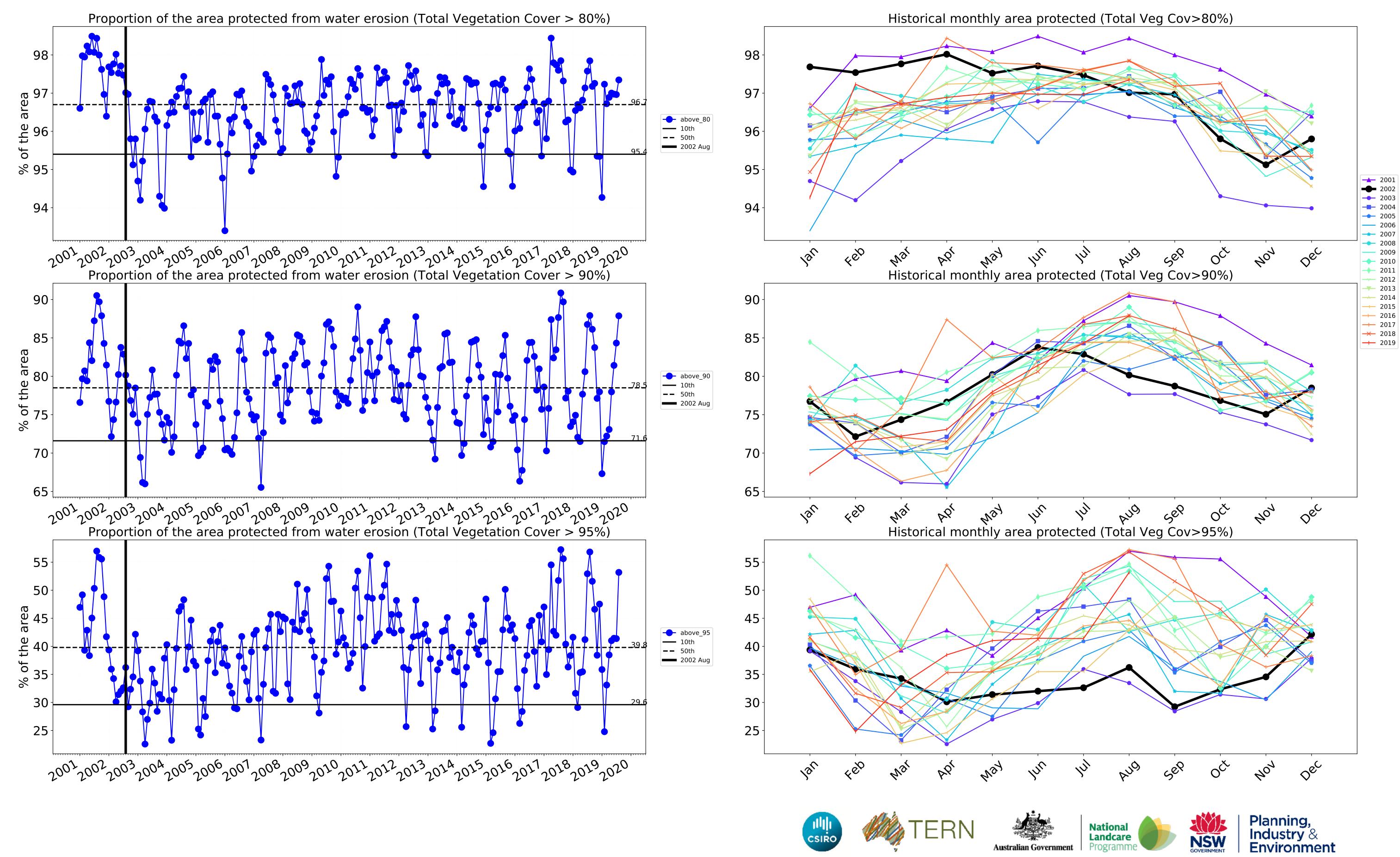
Wind erosion historical monthly area protected (Total Veg Cov >50%)





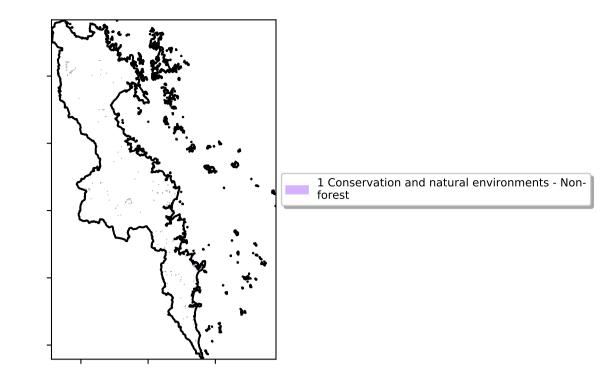


Water erosion historical monthly area protected (Total Veg Cov>70%)

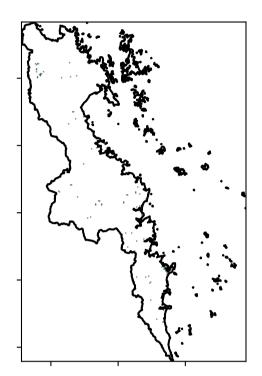


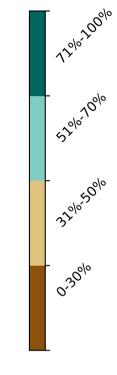
Conservation and natural environments non forest

Land use and forest cover

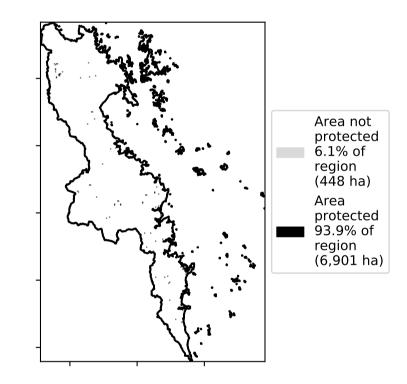


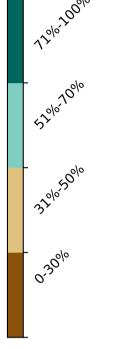
Total Vegetation Cover [%]



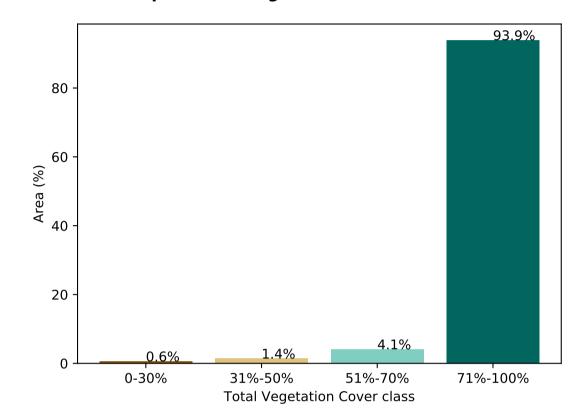


% Area protected from water erosion (>70%)

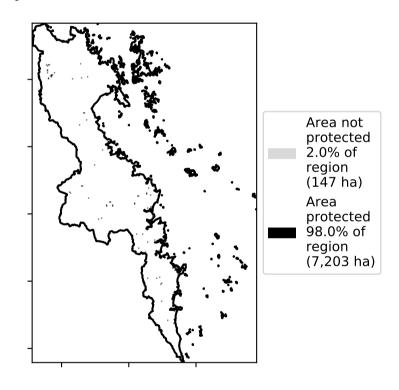




Proportion of vegetation cover class in area

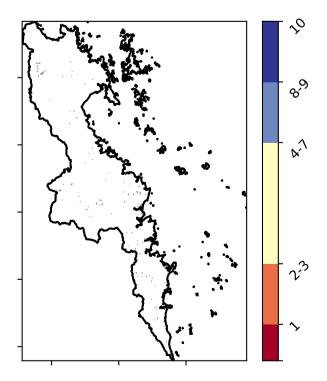


% Area protected from wind erosion (>50%)

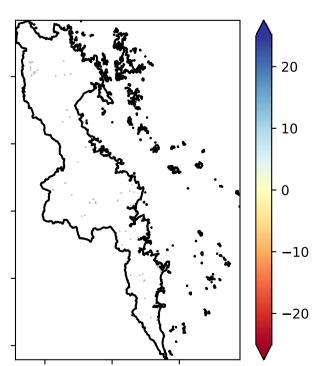


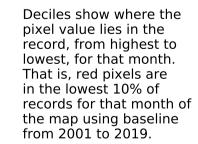
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]

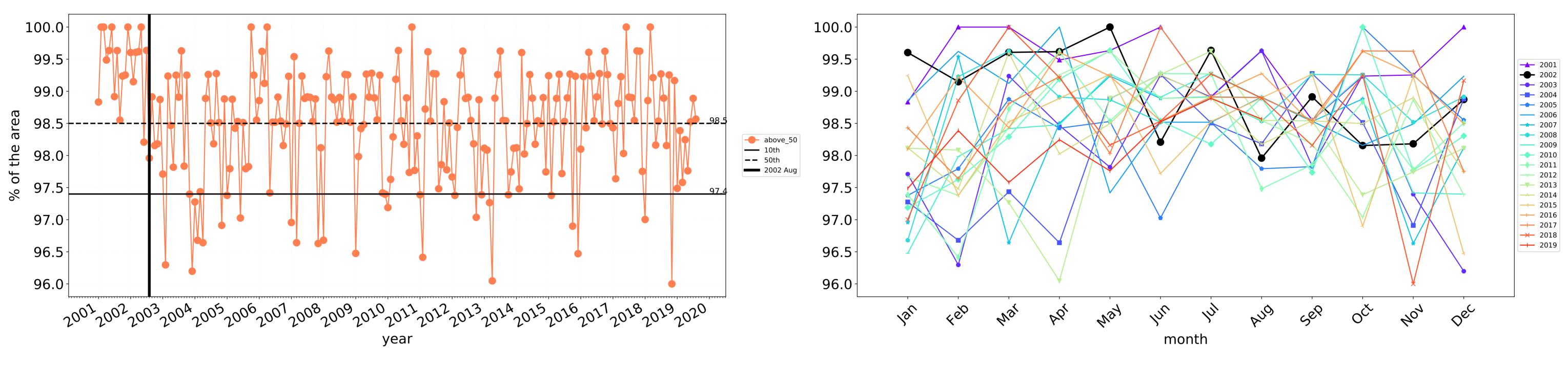


Total Vegetation Cover Anomaly [%]





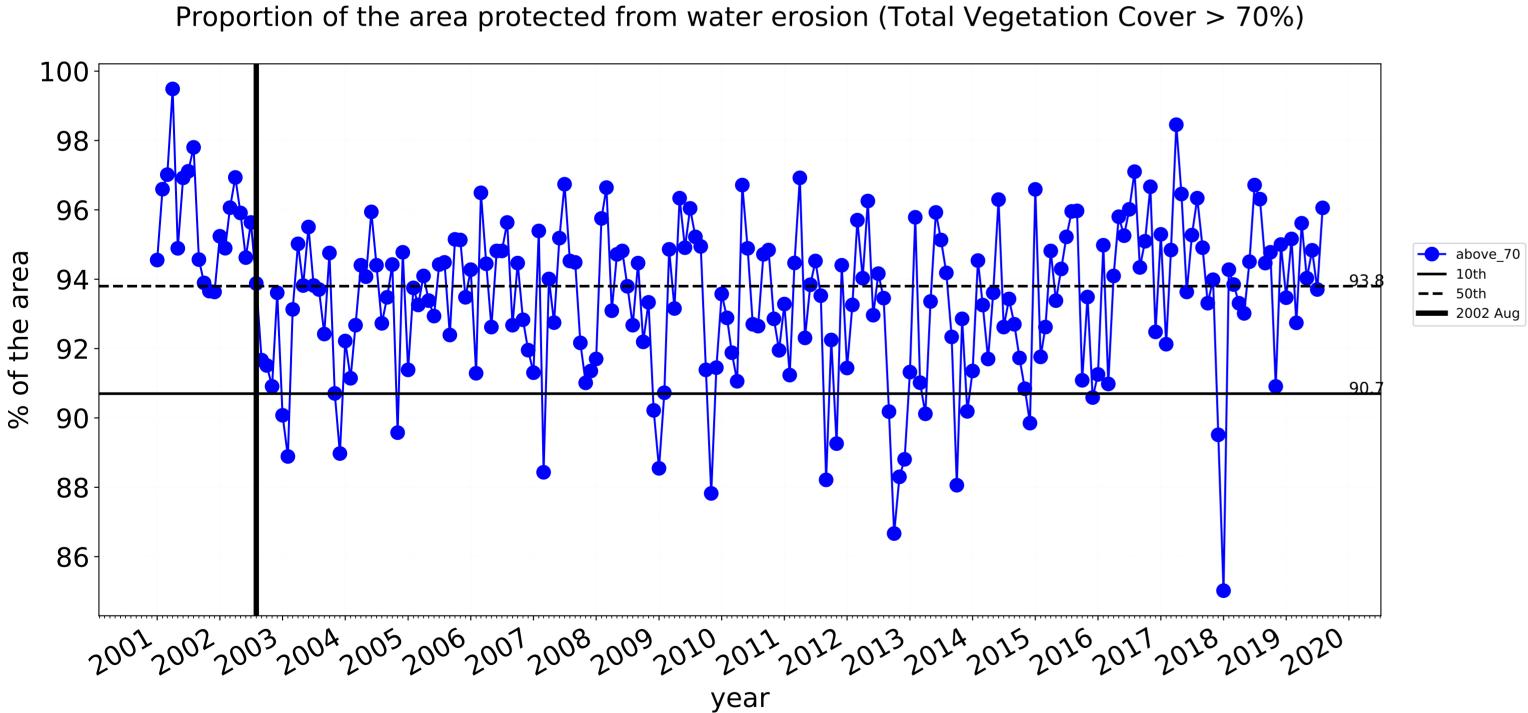


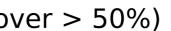


--- above_70

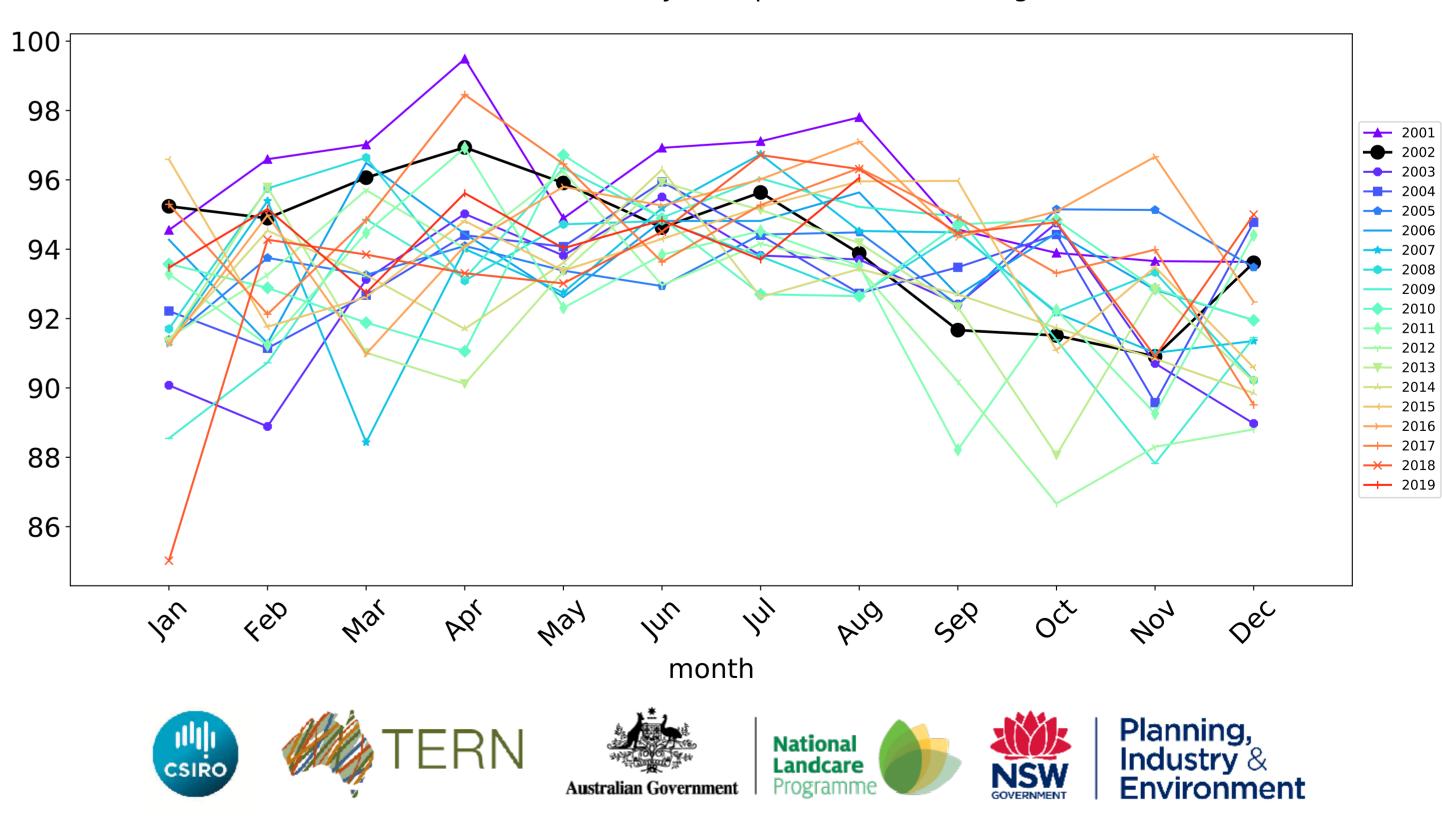
— 10th

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

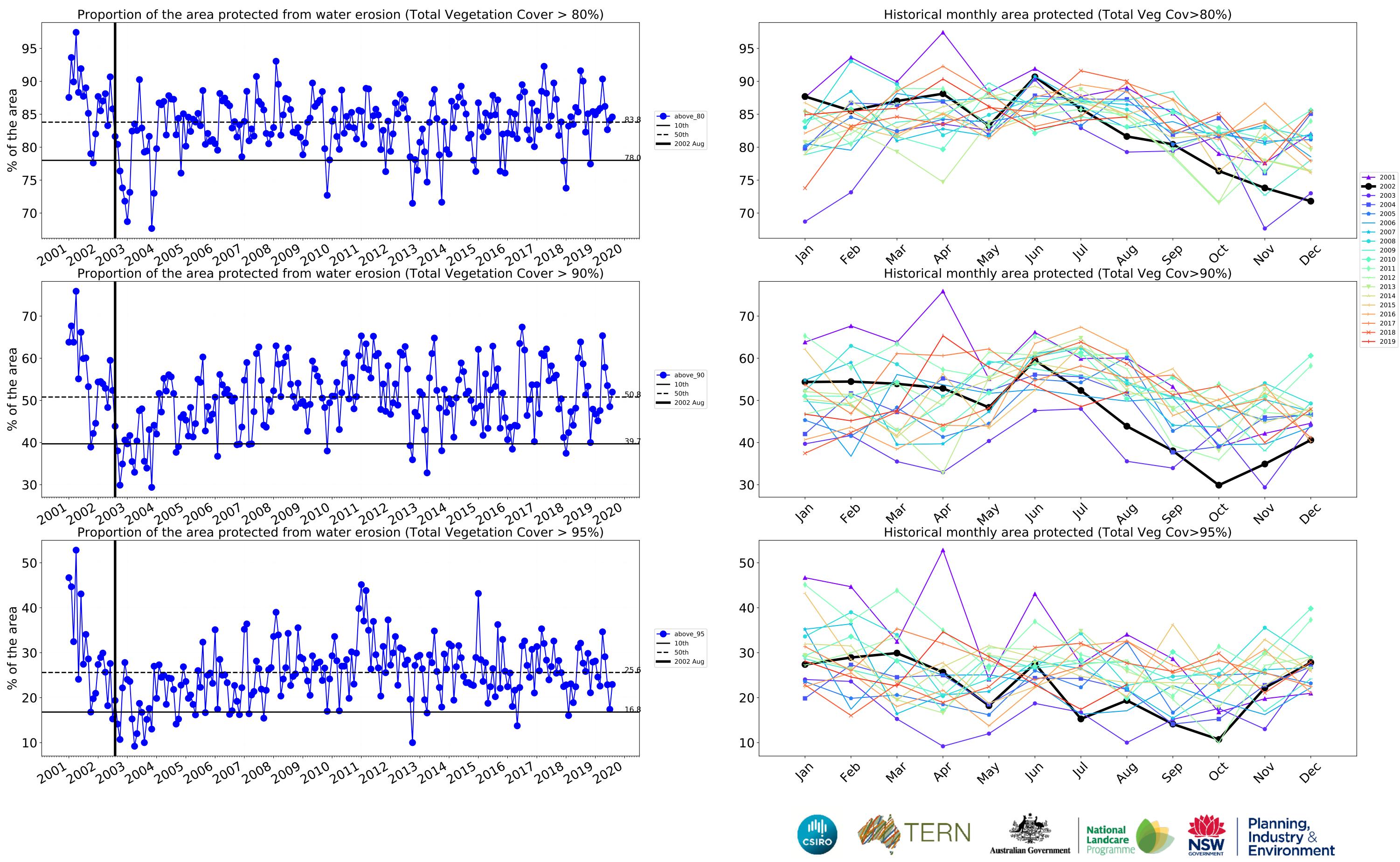




Wind erosion historical monthly area protected (Total Veg Cov >50%)

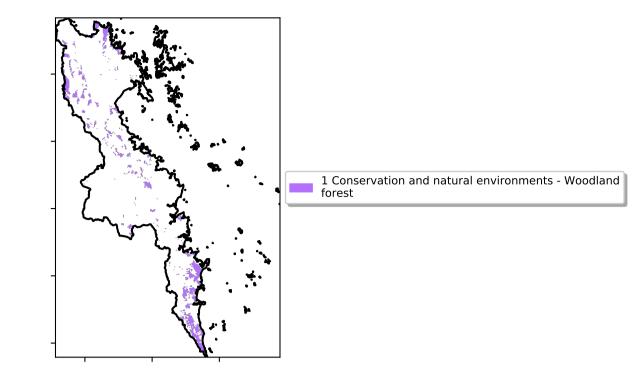


Water erosion historical monthly area protected (Total Veg Cov>70%)

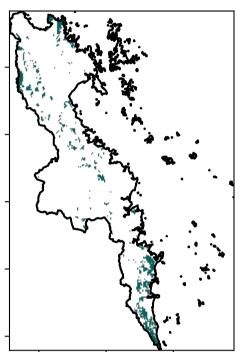


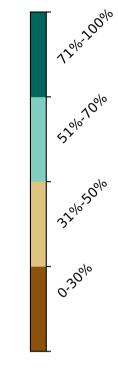
Conservation and natural environments Woodland forest

Land use and forest cover

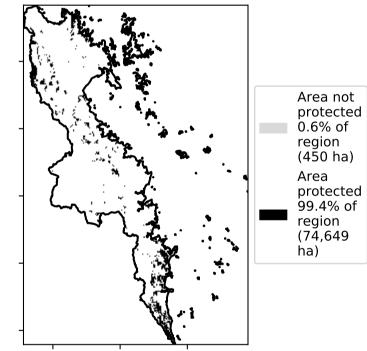


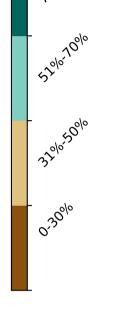
Total Vegetation Cover [%]

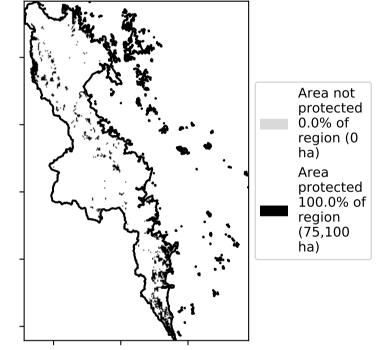




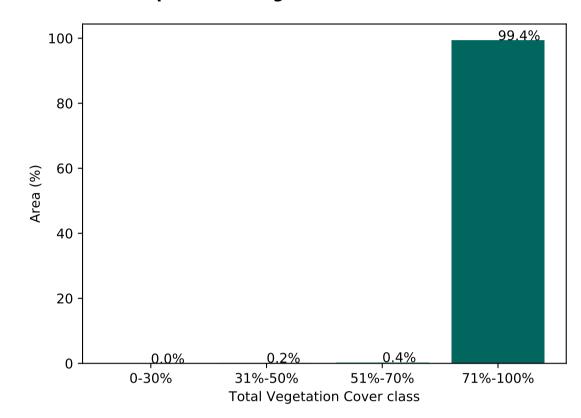
% Area protected from water erosion (>70%)



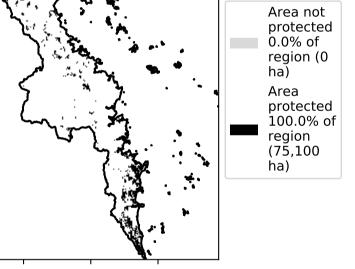




Proportion of vegetation cover class in area

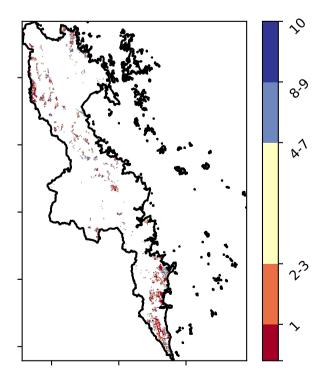


% Area protected from wind erosion (>50%)

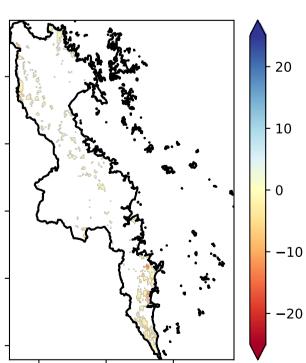


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]

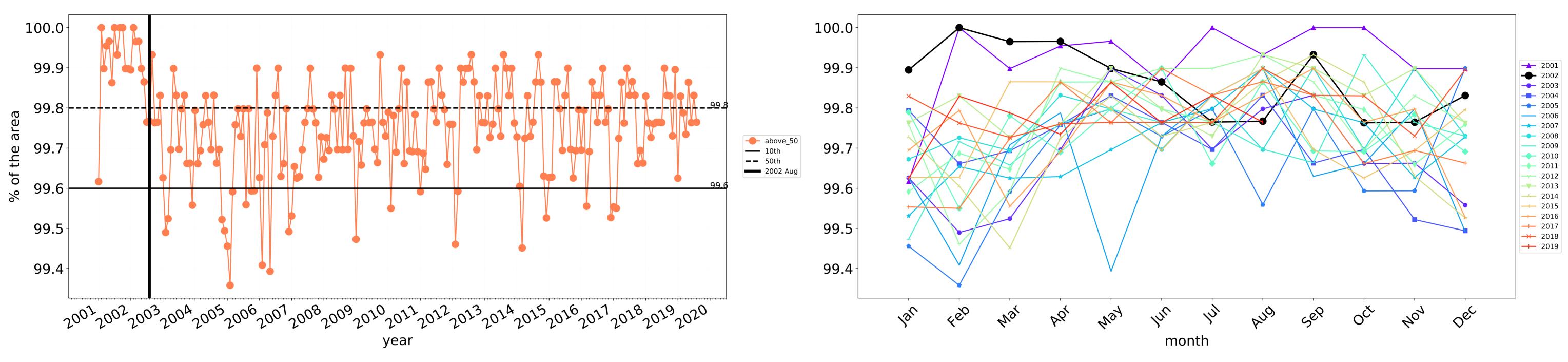


Total Vegetation Cover Anomaly [%]



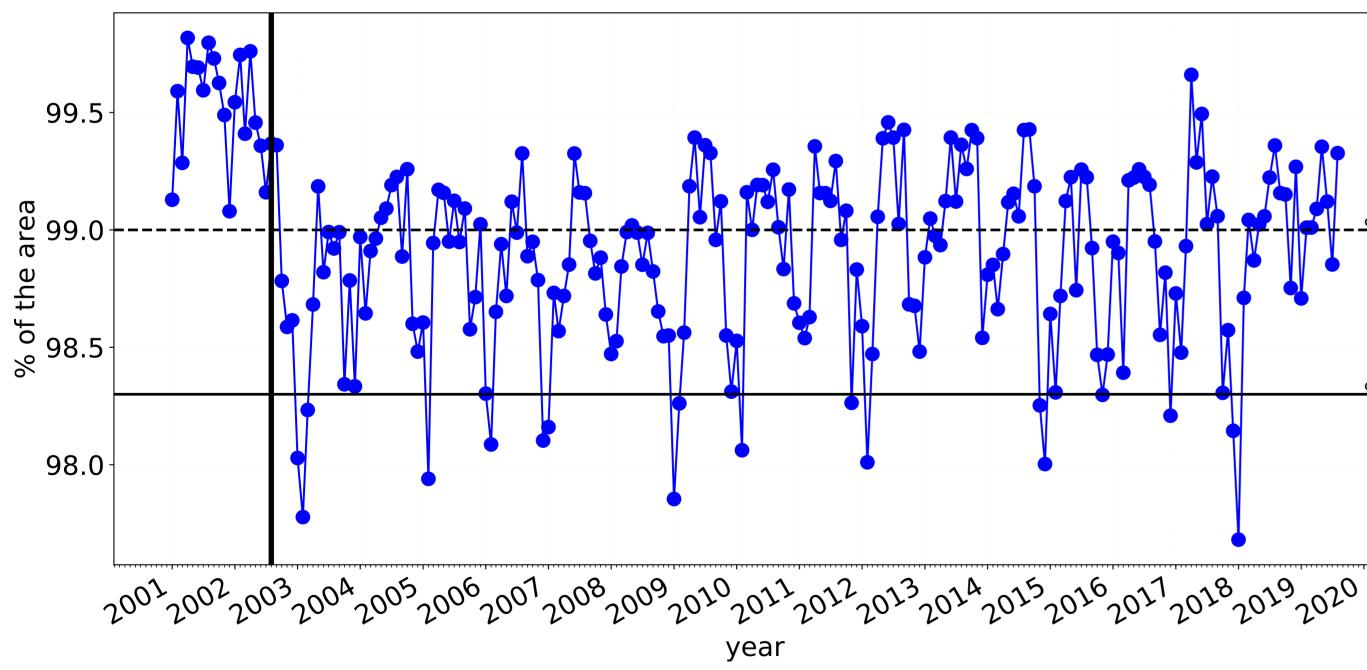
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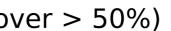




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

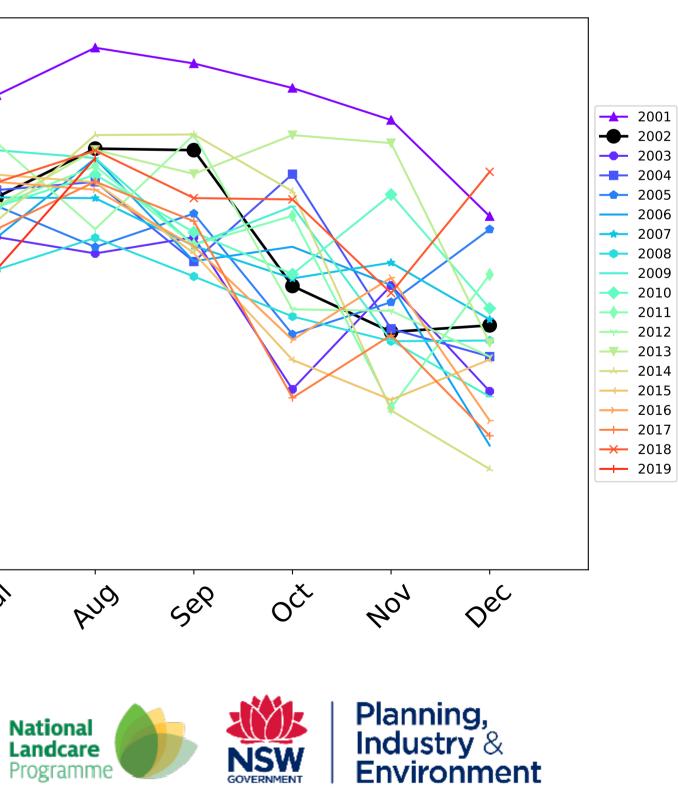


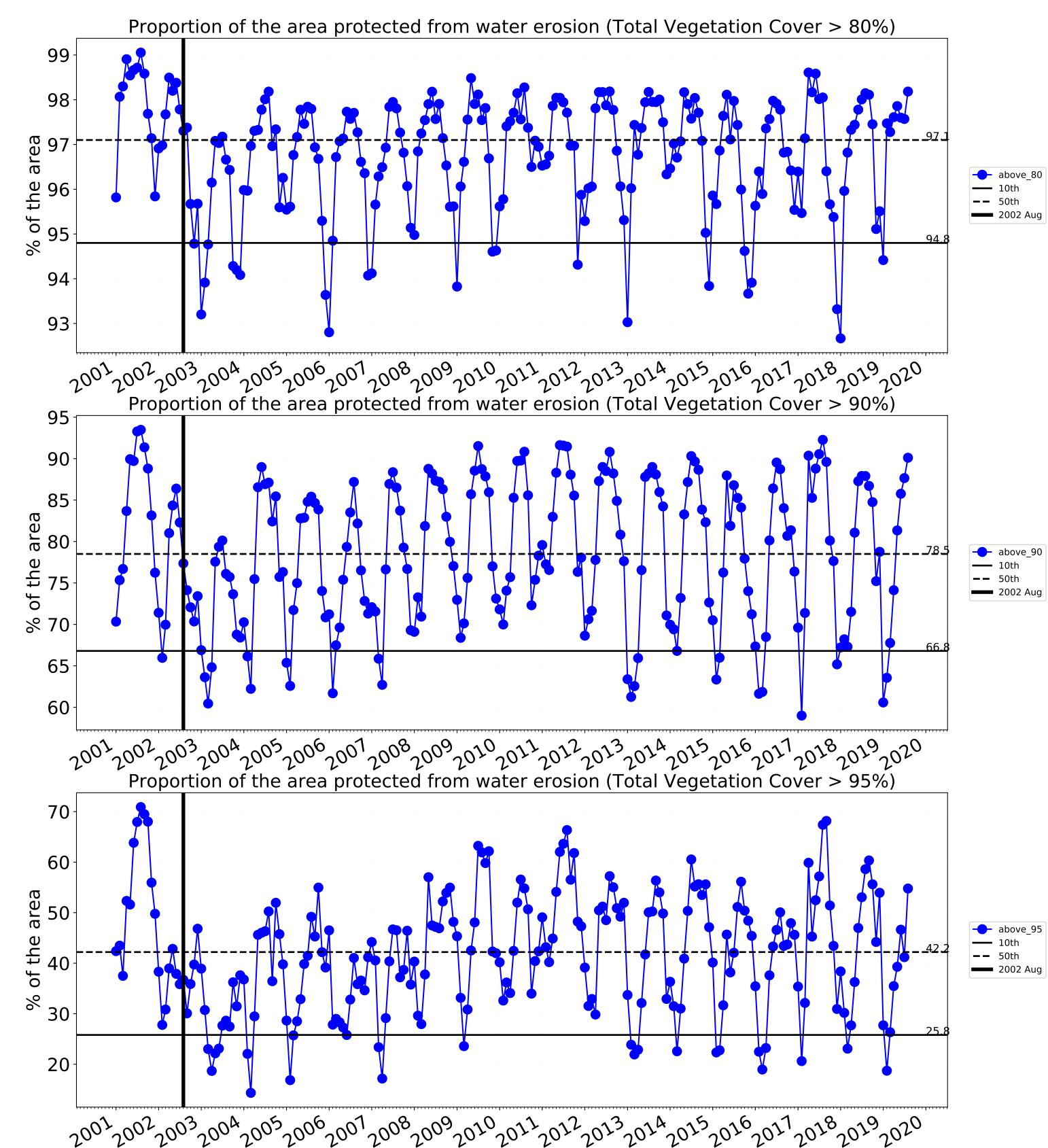


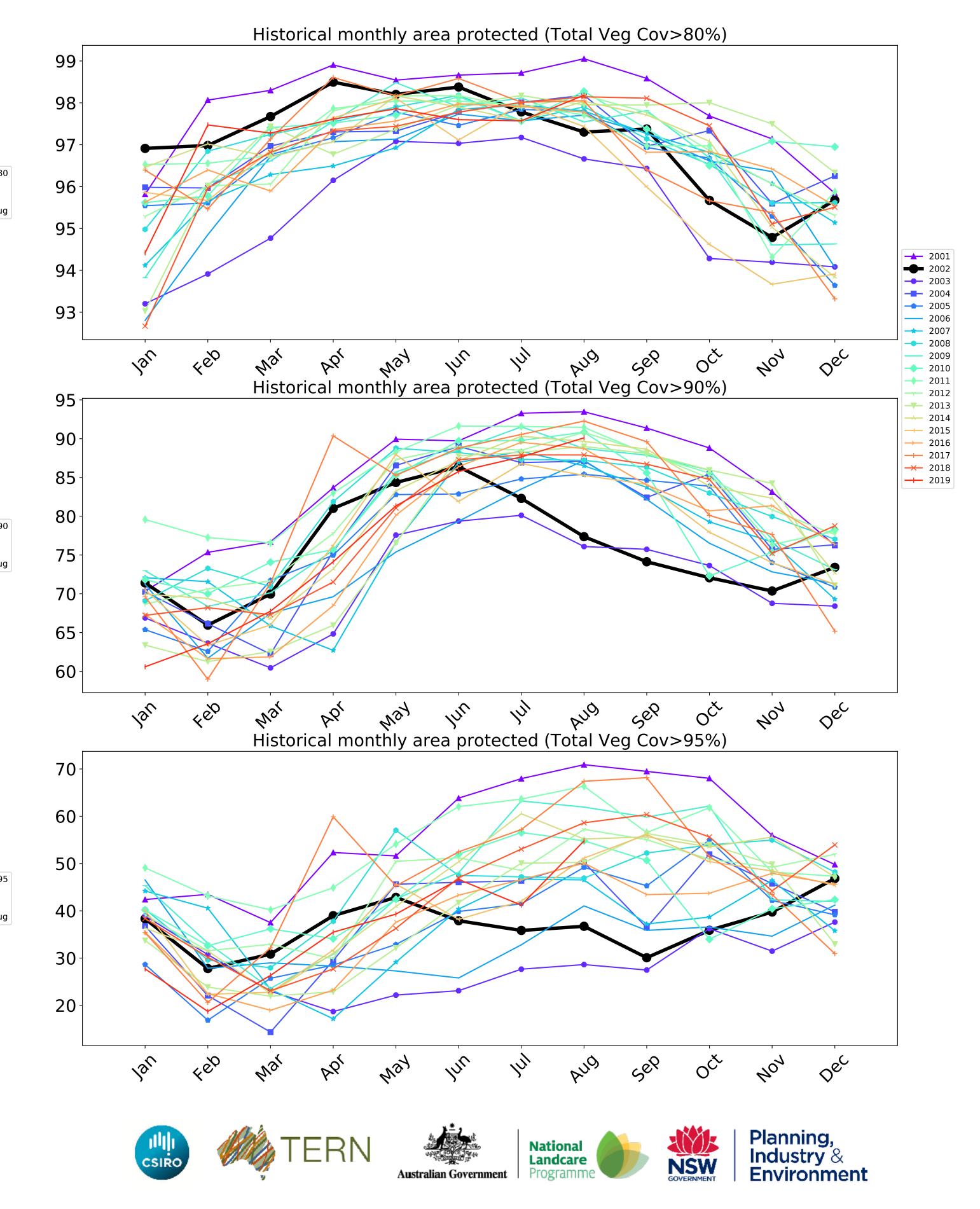
Wind erosion historical monthly area protected (Total Veg Cov >50%)

99.5 --- above_70 — 10th 99.0-**——** 50th 98.5 98.0 Jan feb In way 291 Nai month ERN Programm Australian Government

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

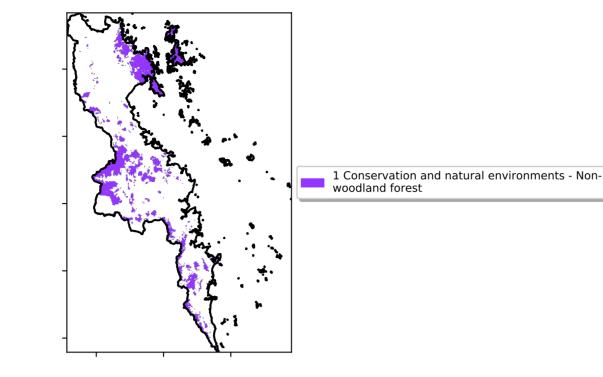




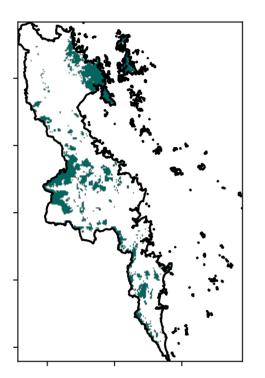


Conservation and natural environments Forest (non woodland)

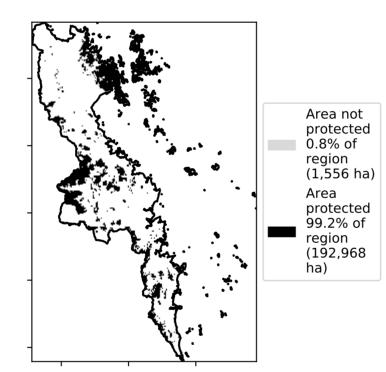
Land use and forest cover

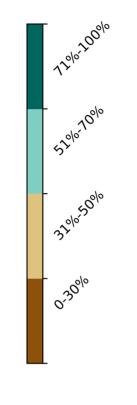


Total Vegetation Cover [%]



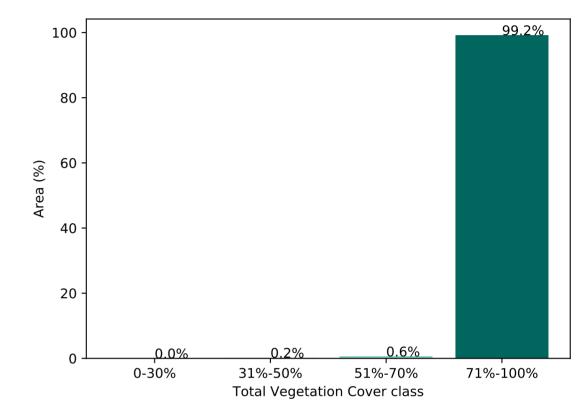
% Area protected from water erosion (>70%)



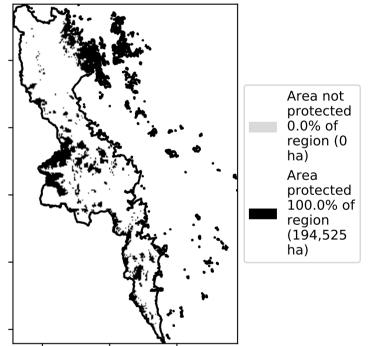




Proportion of vegetation cover class in area



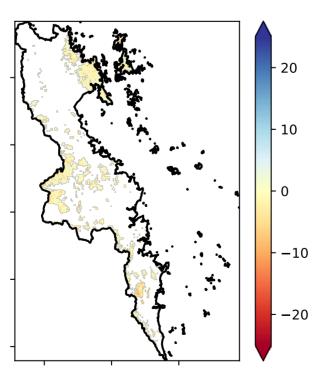
% Area protected from wind erosion (>50%)



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

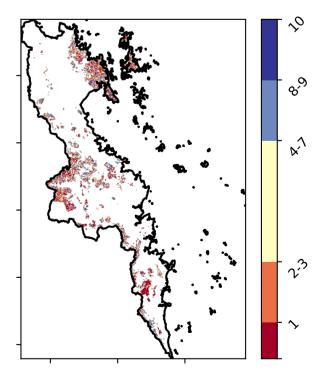
Total Vegetation Cover Anomaly [%]

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.



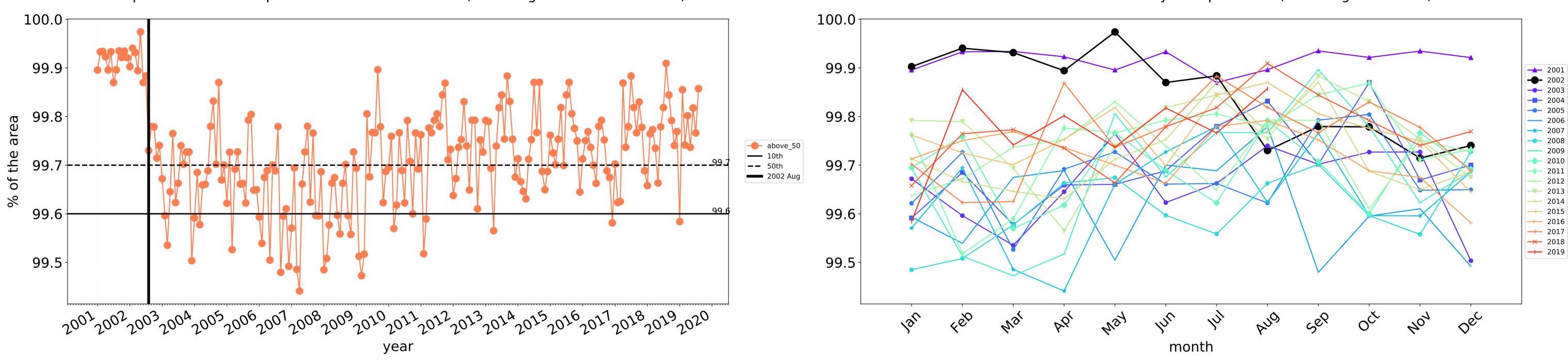
Total Vegetation Cover Decile [%]

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.



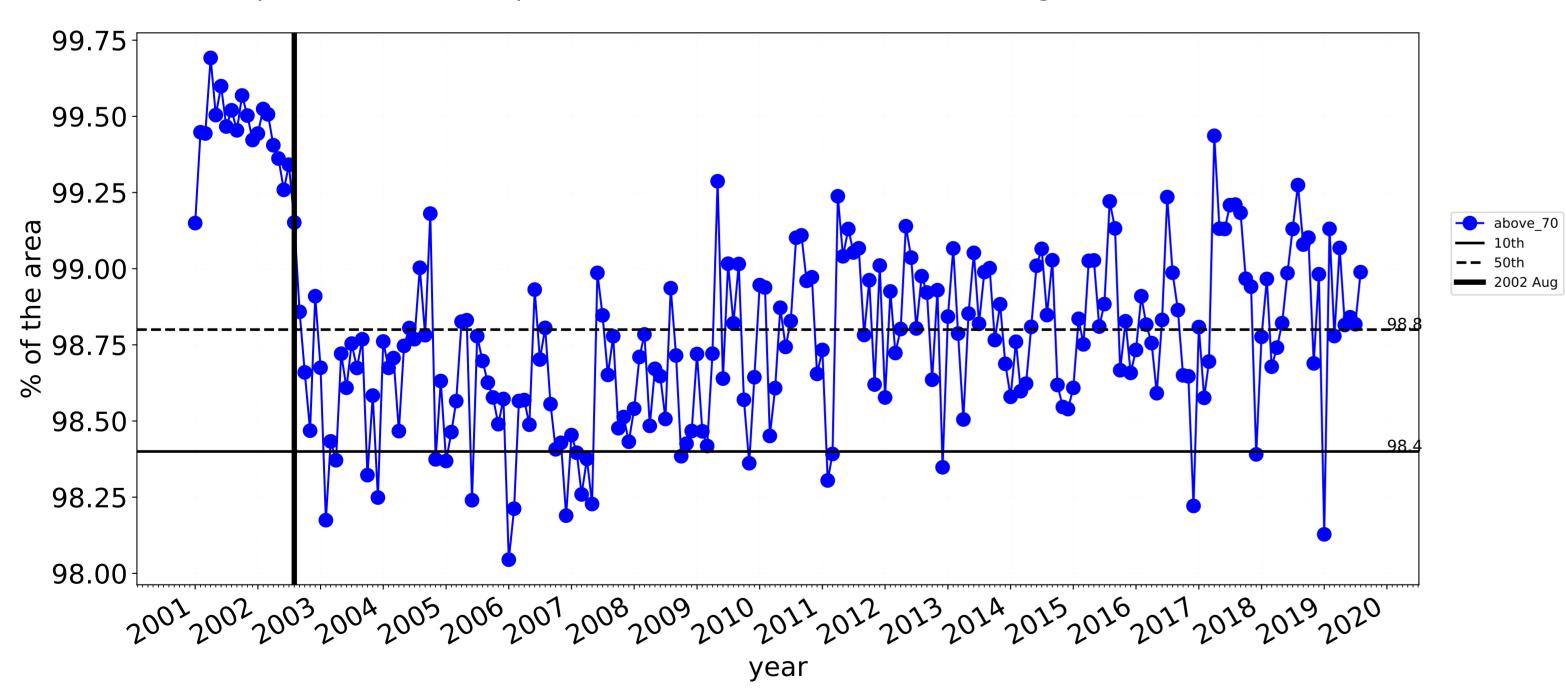


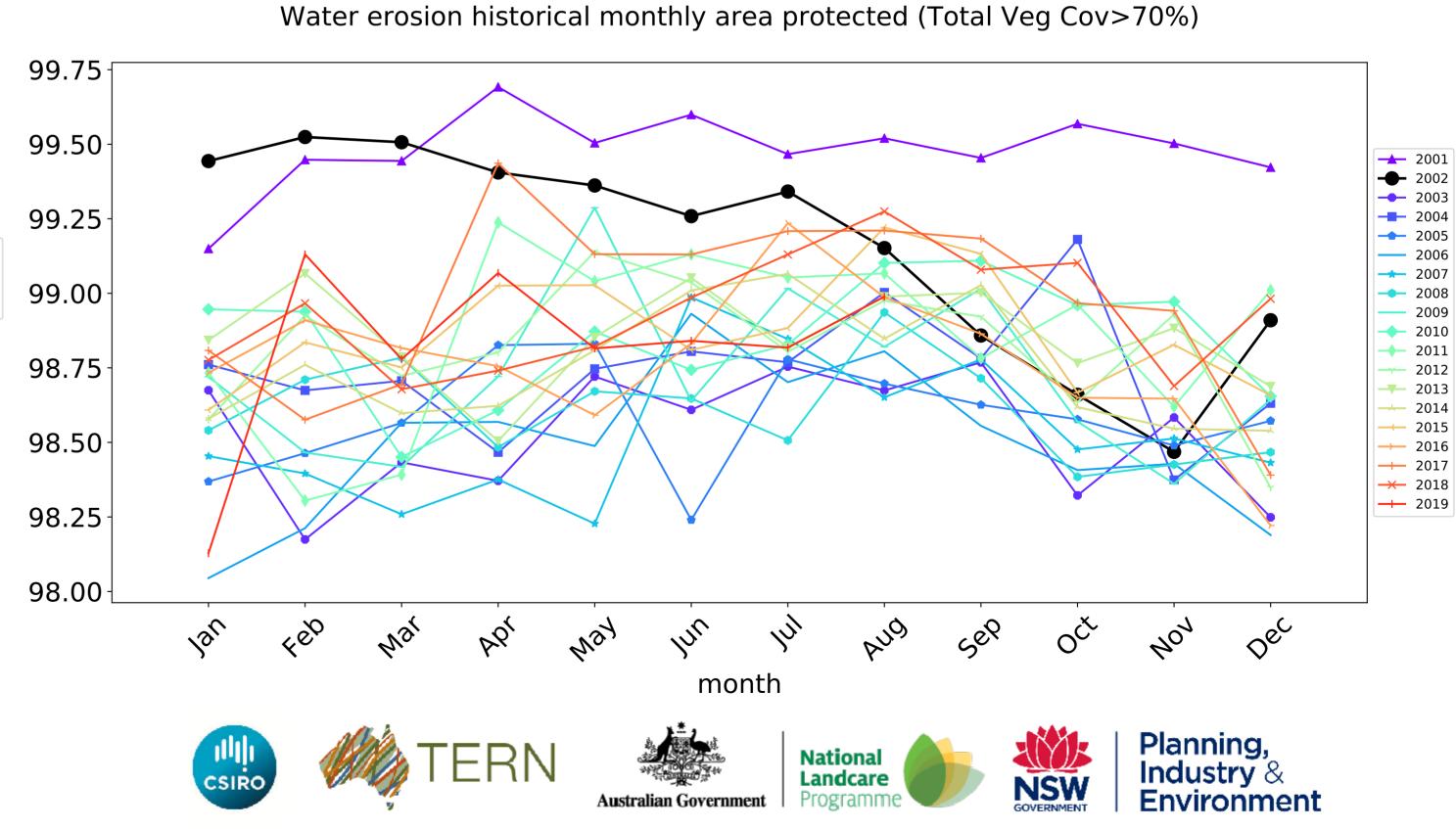
Conservation and natural environments Forest (non woodland) timeseries



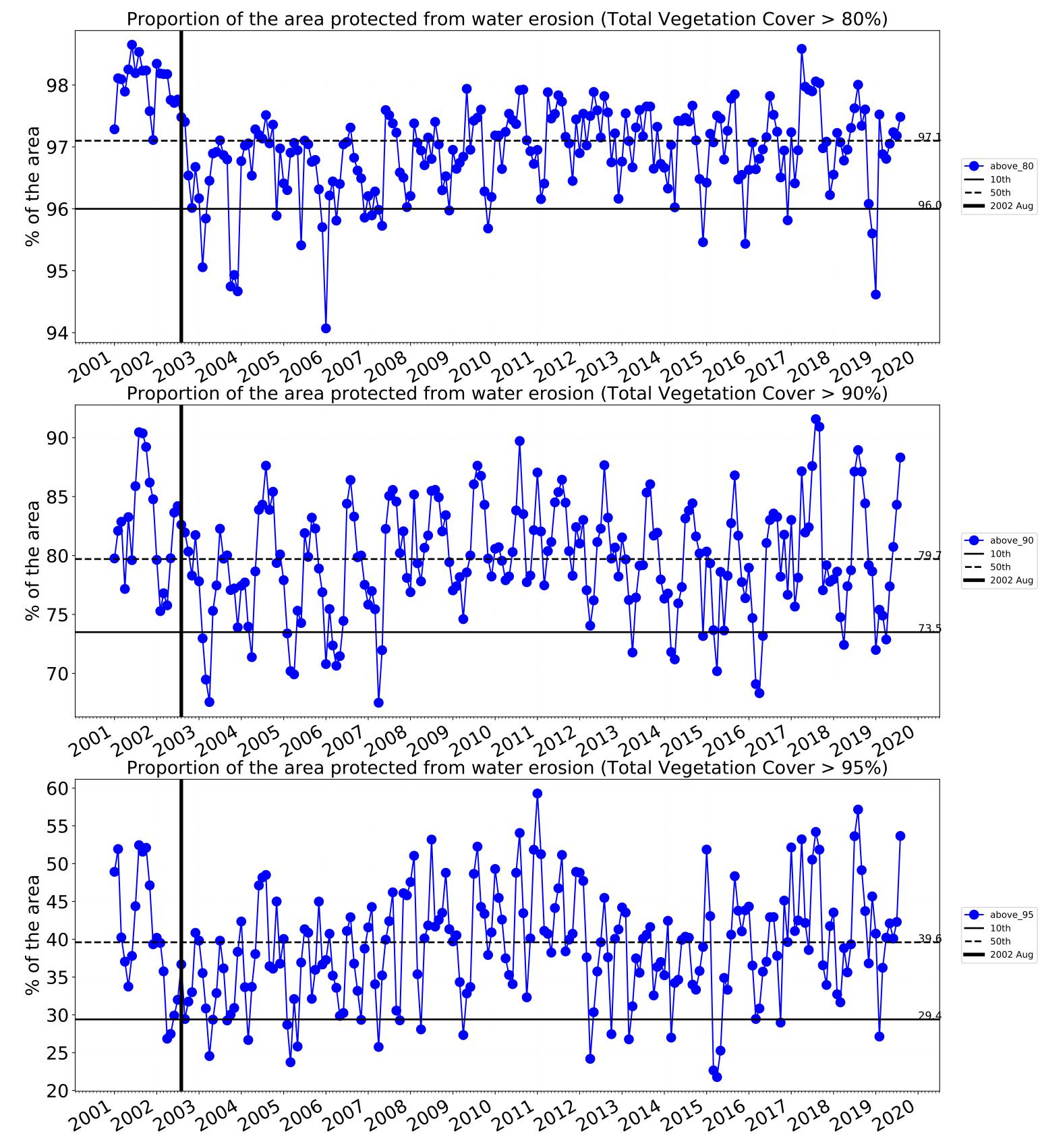
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

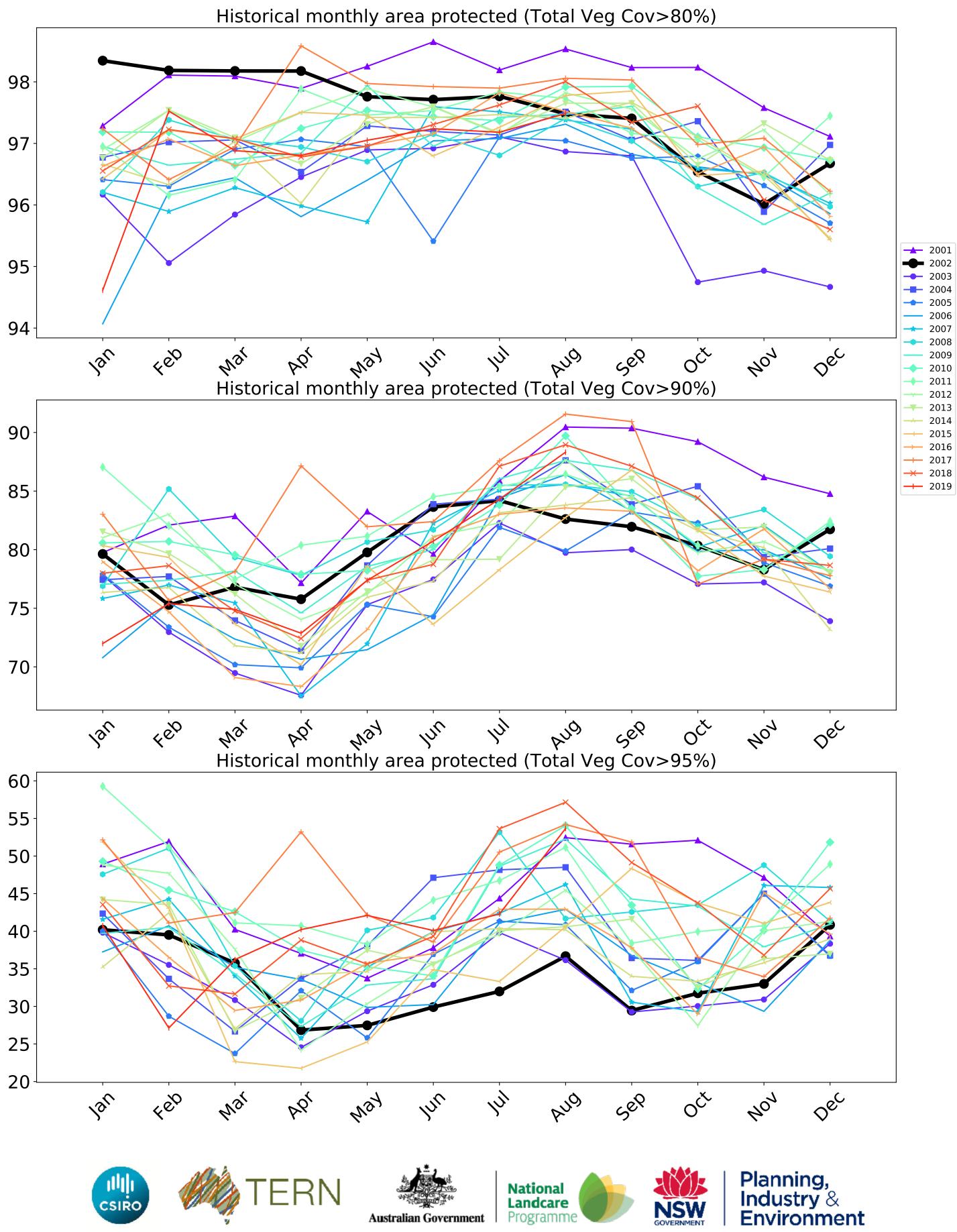
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





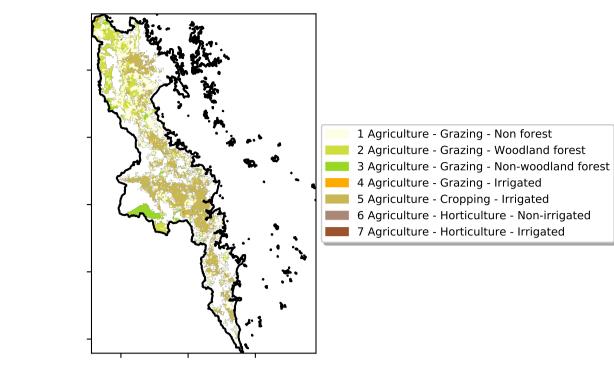
Wind erosion historical monthly area protected (Total Veg Cov >50%)



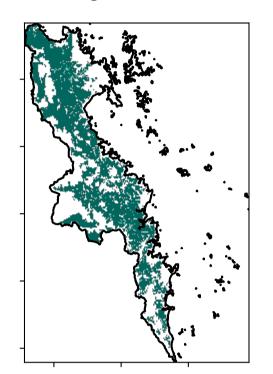


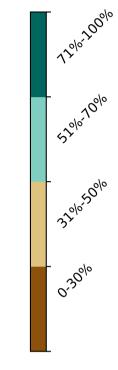
Agriculture

Land use and forest cover



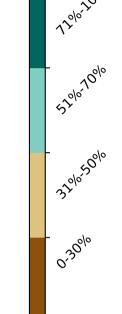
Total Vegetation Cover [%]

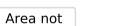




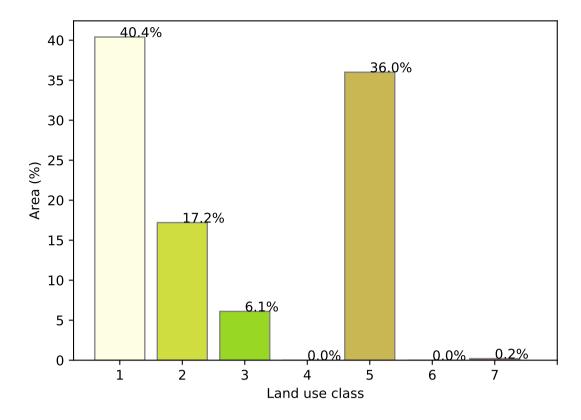
% Area protected from water erosion (>70%)



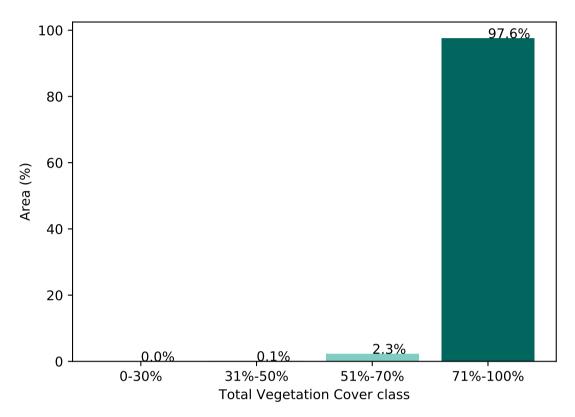




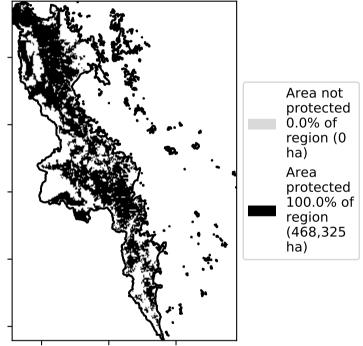
Proportion of each land class in area



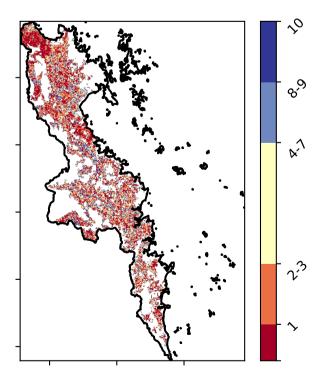
Proportion of vegetation cover class in area

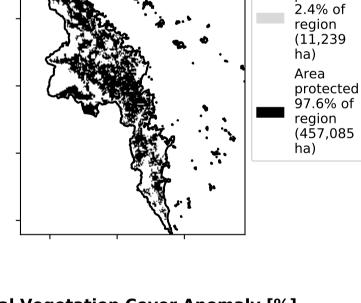


% Area protected from wind erosion (>50%)



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

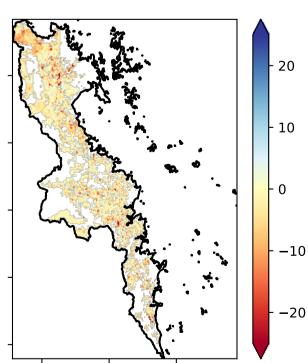
of Australia (2018)

Derived from

Use of Australia

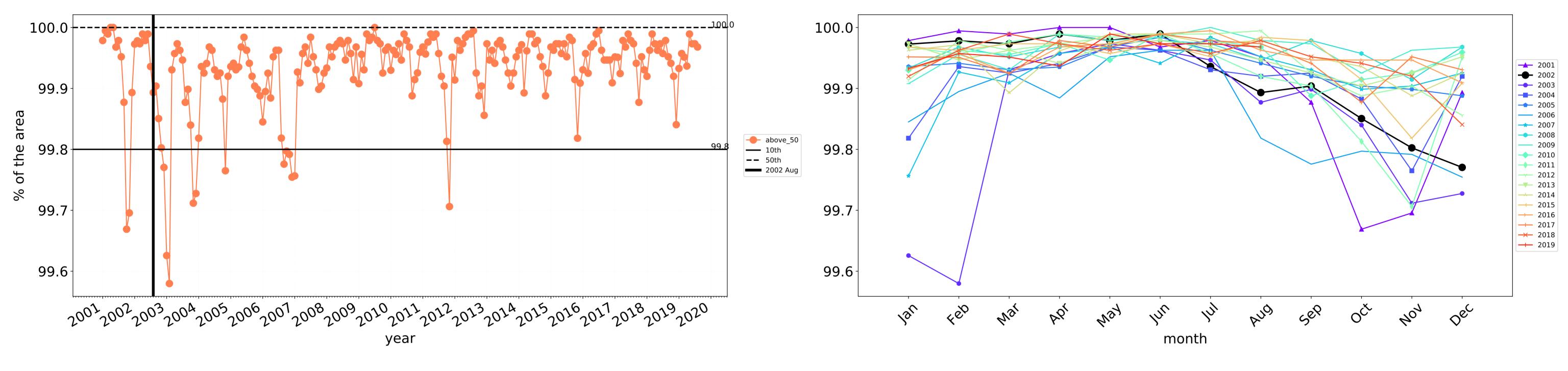
Land Use and Forests

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.





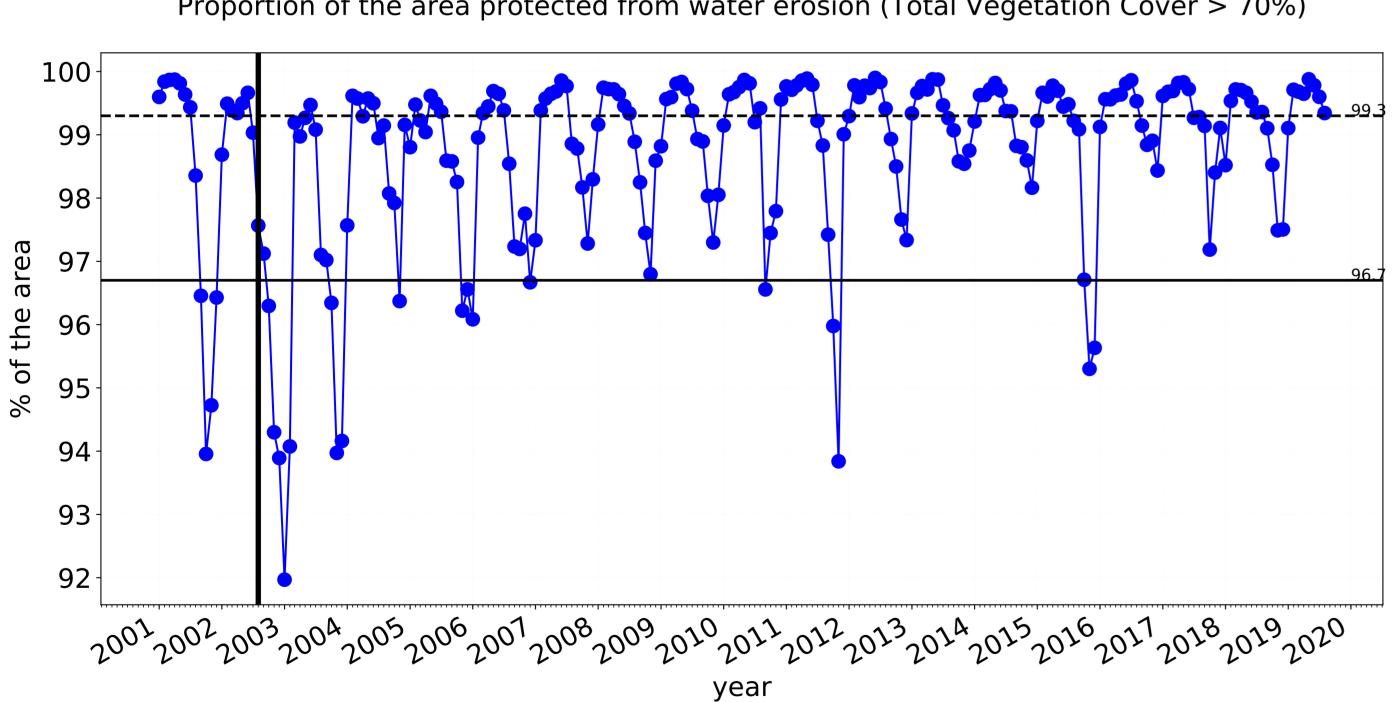
---- above_70

— 2002 Aug

—— 10th

—— 50th

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

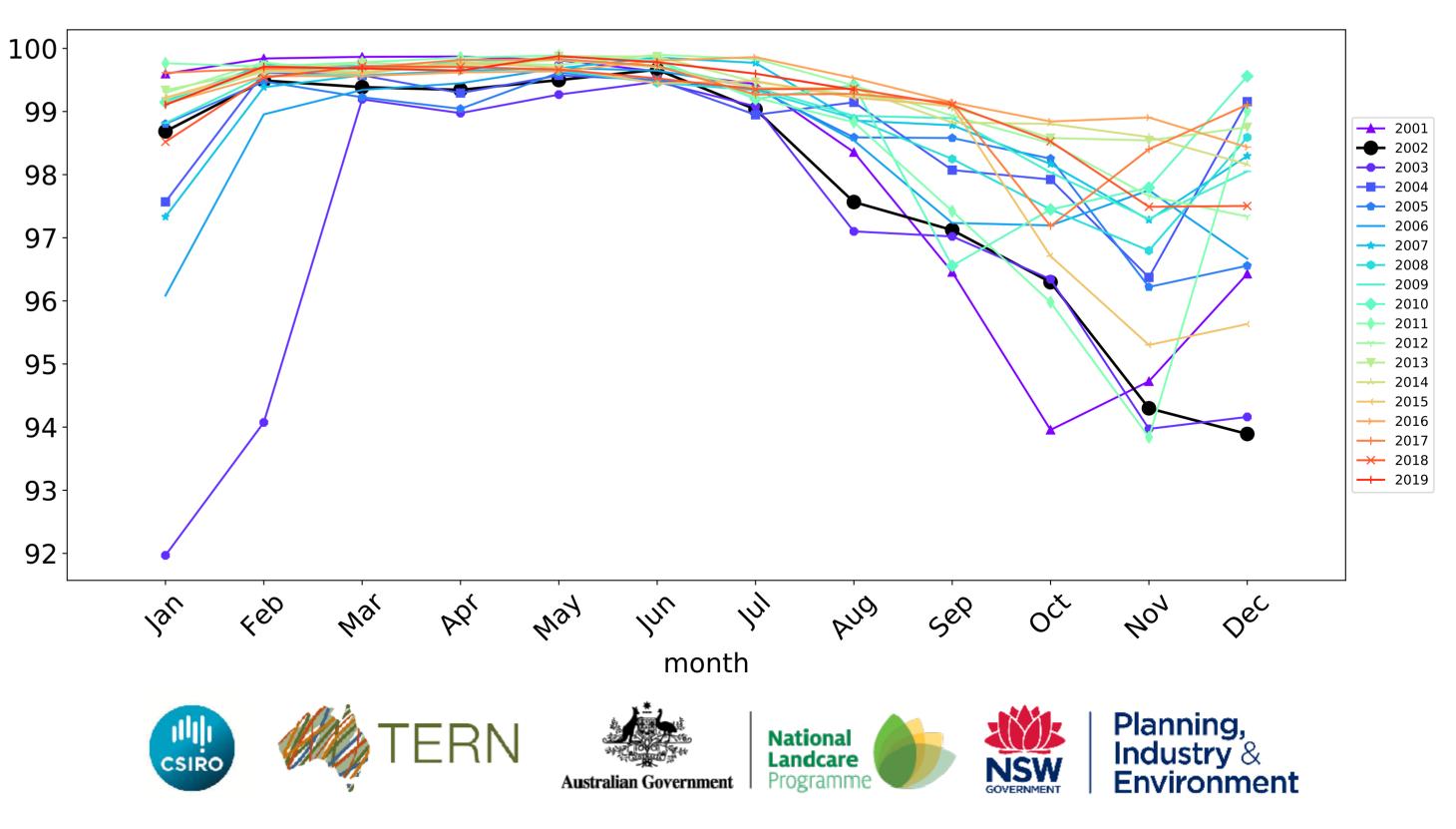


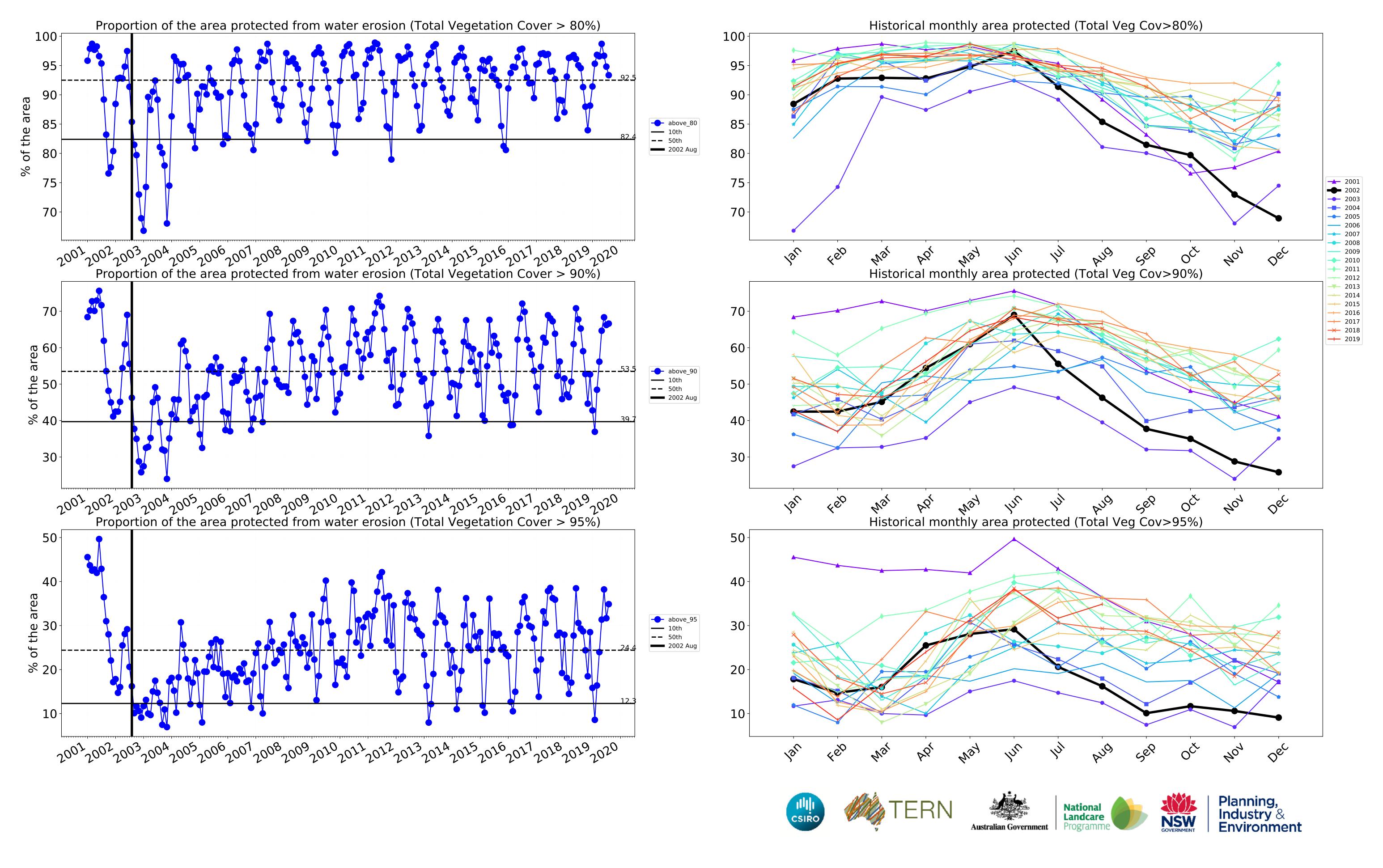
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

Agriculture timeseries

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

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

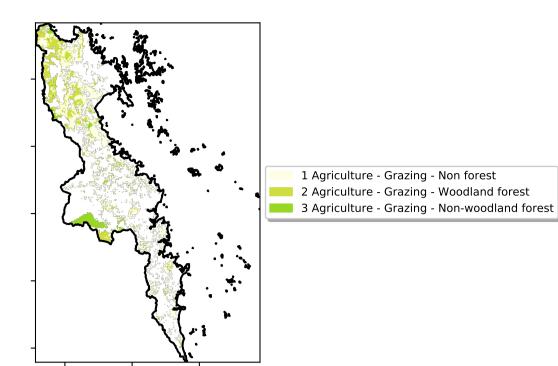




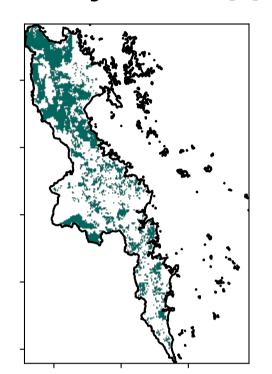
Grazing

Land use and forest cover

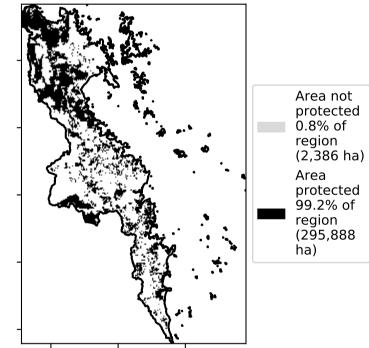
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

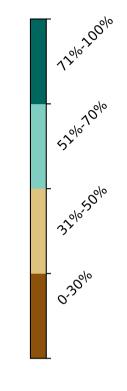


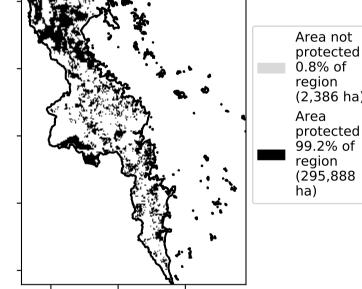
Total Vegetation Cover [%]

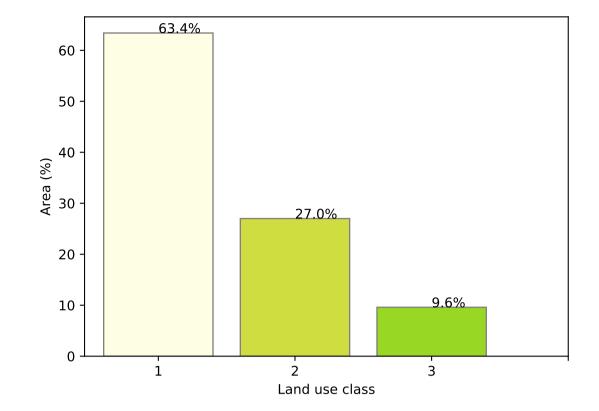






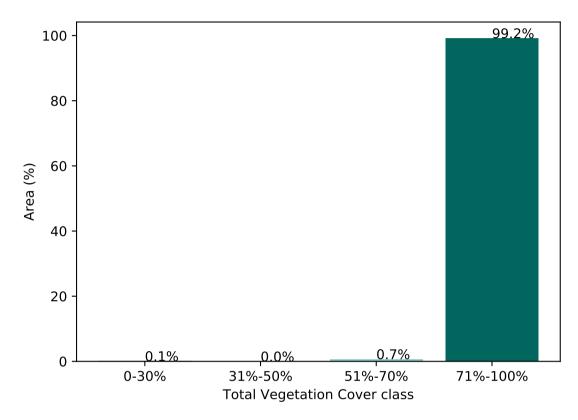




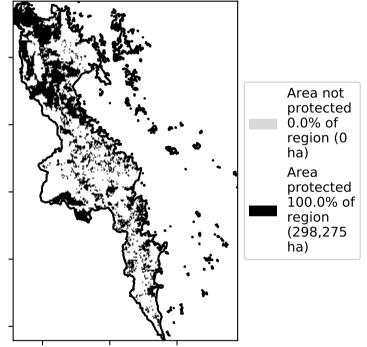


Proportion of each land class in area

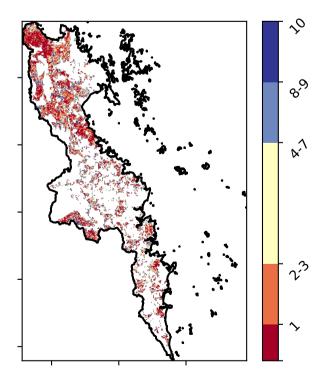
Proportion of vegetation cover class in area



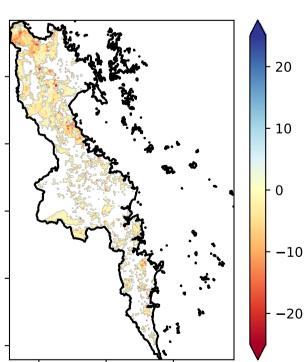
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]

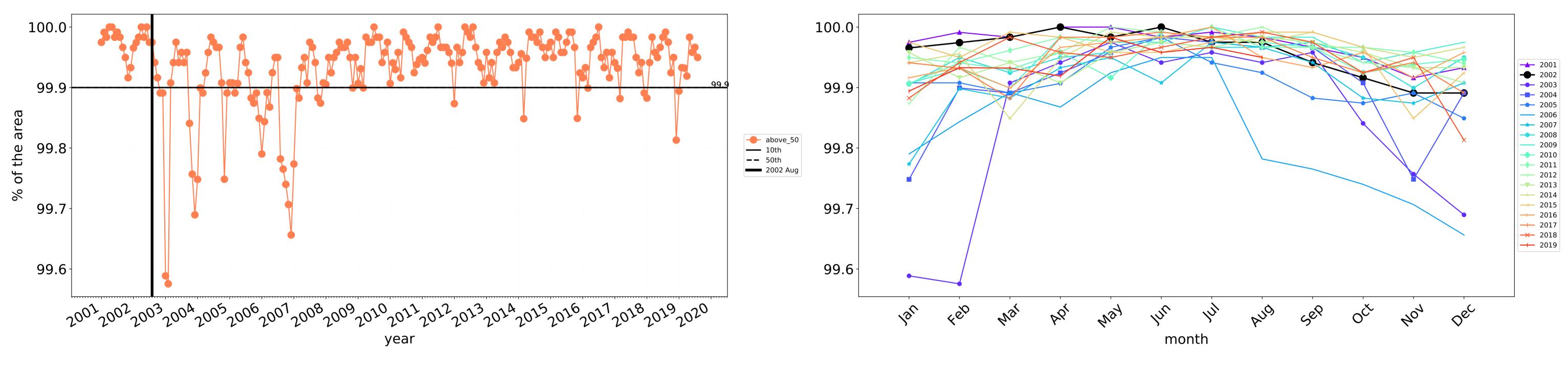


Total Vegetation Cover Anomaly [%]



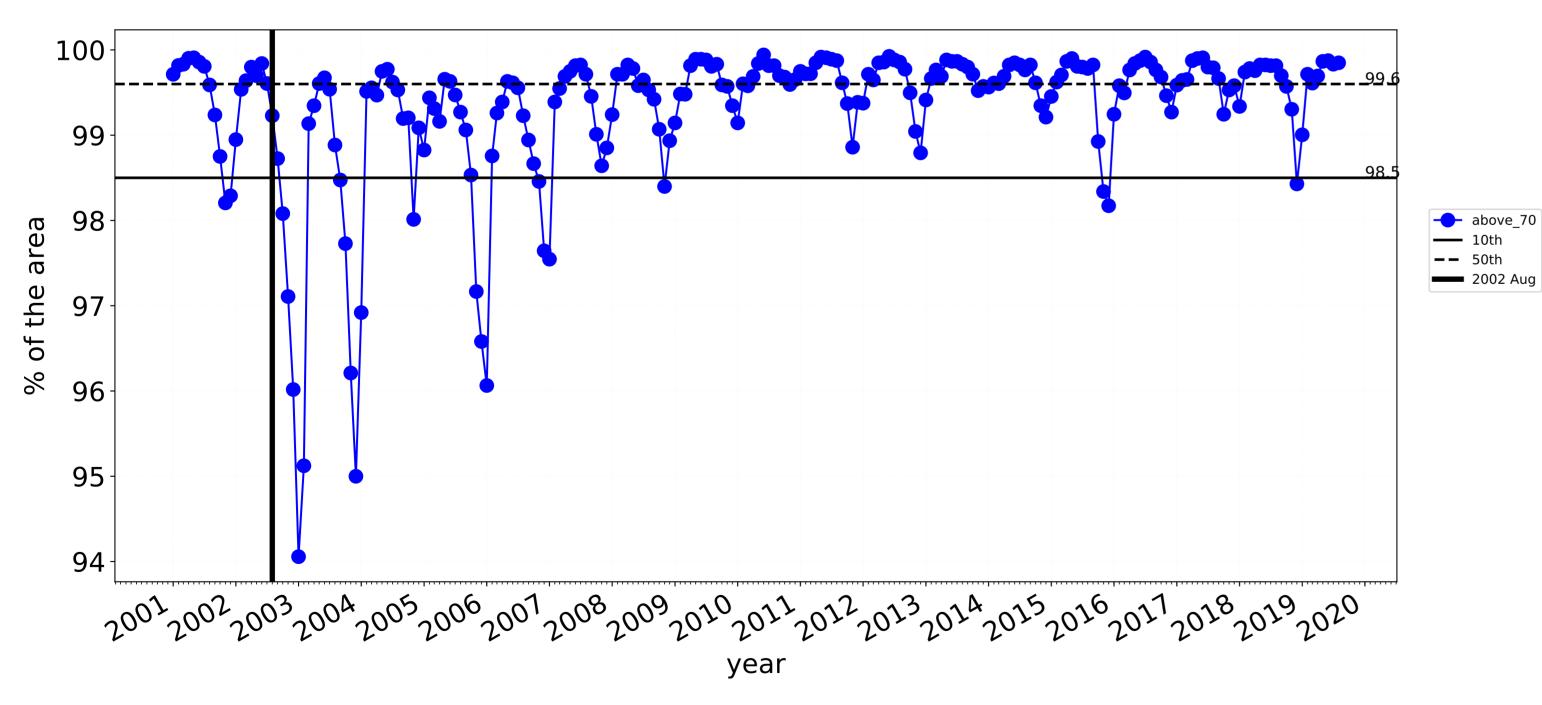
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

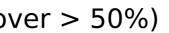




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

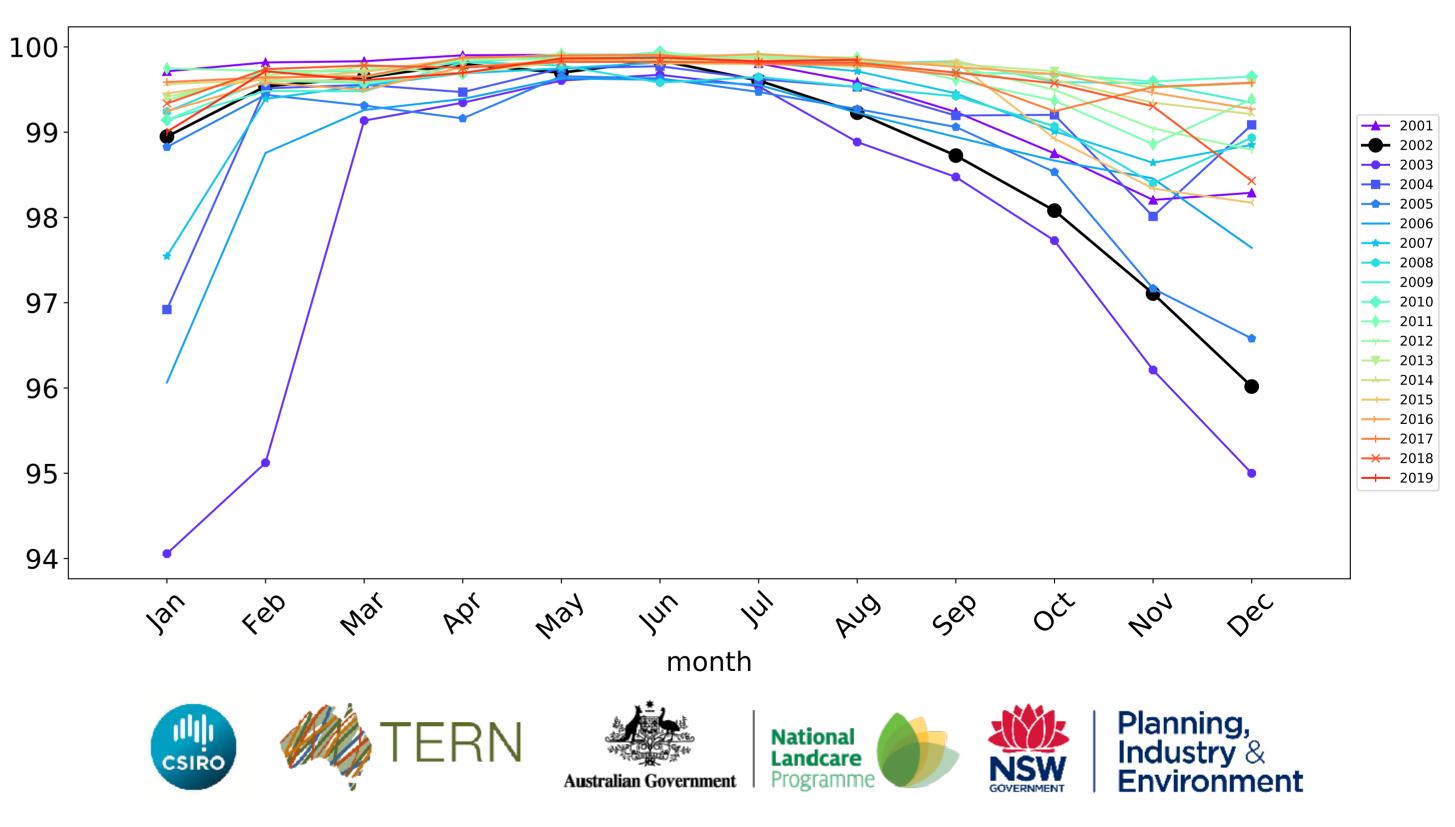


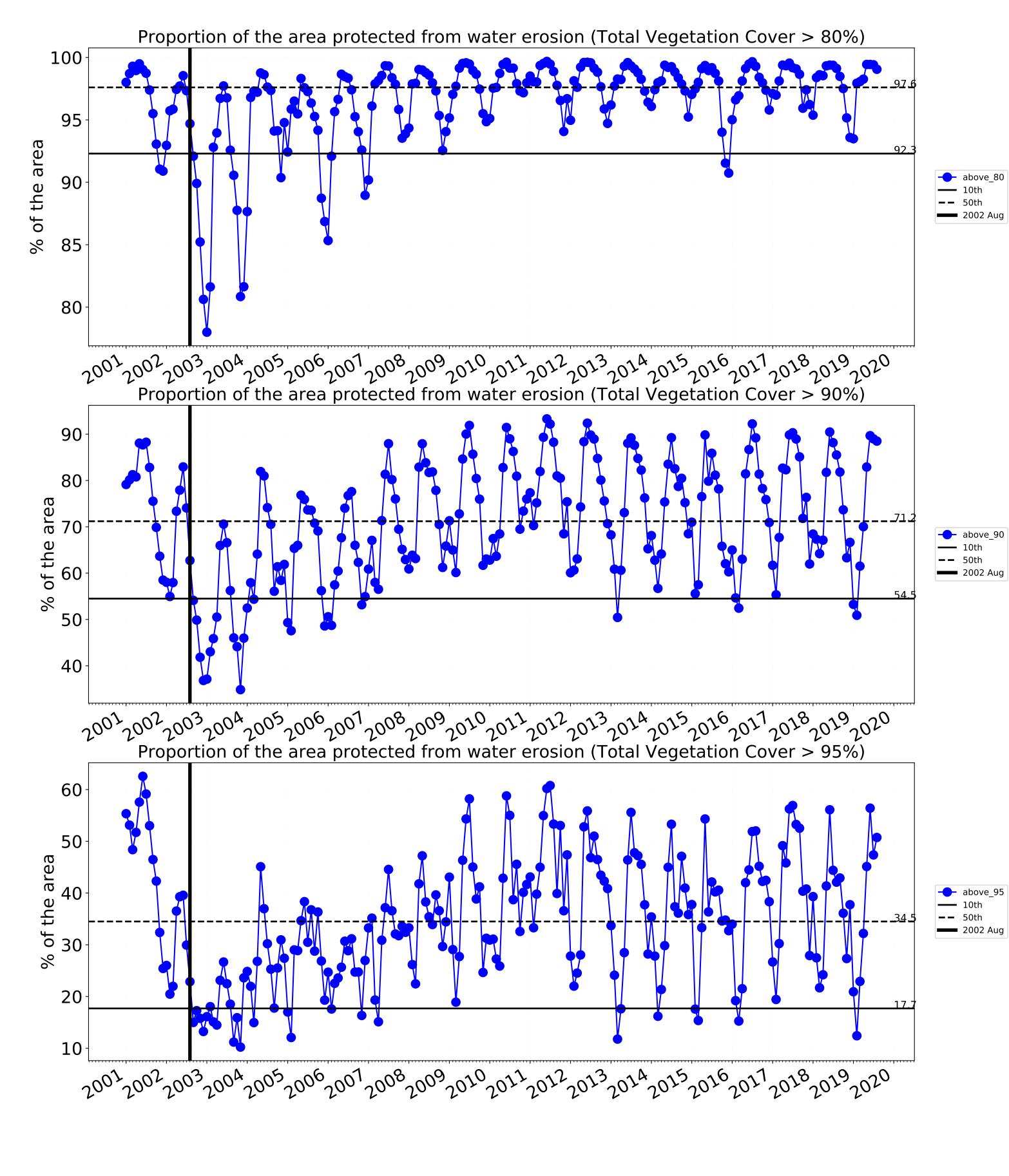


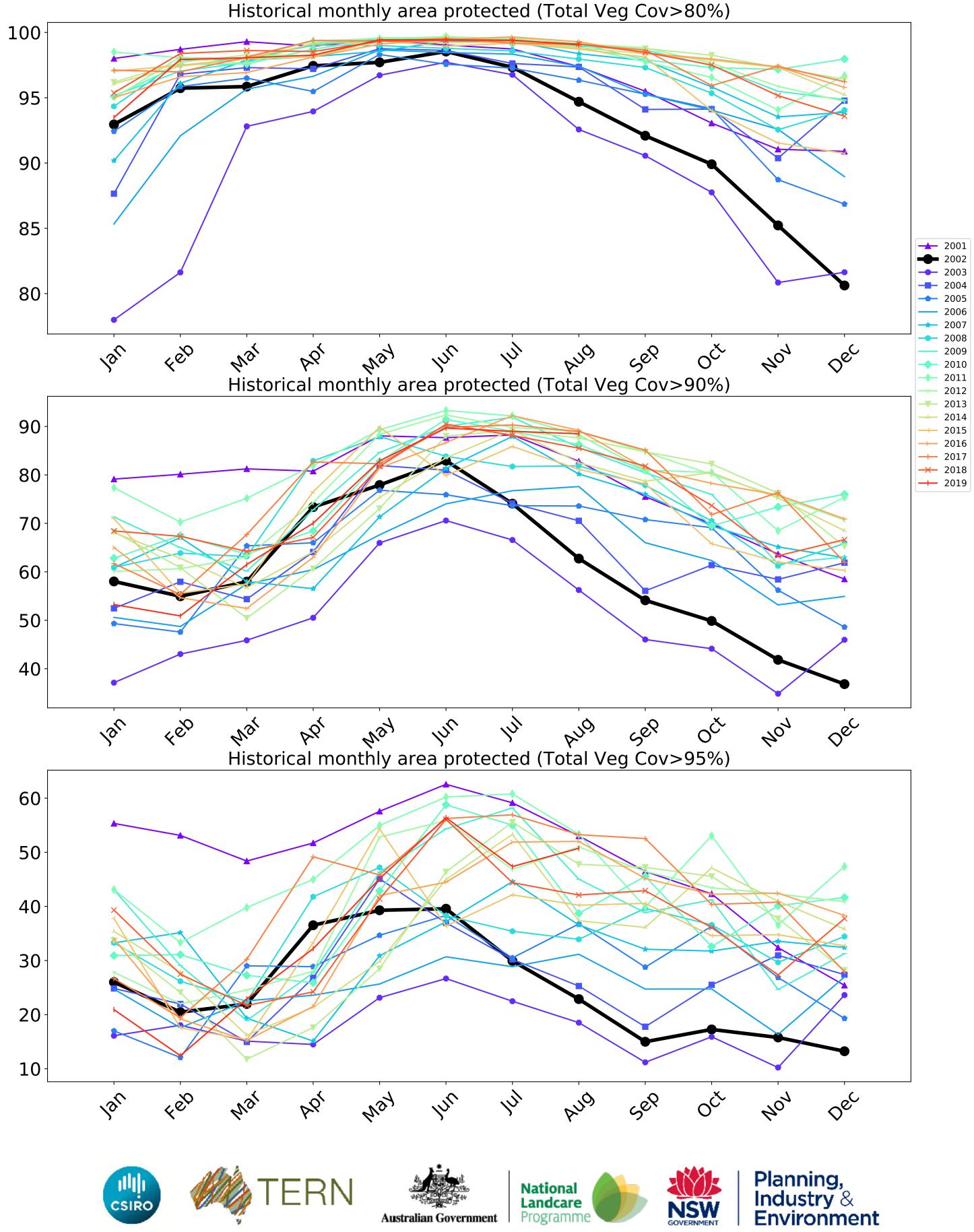


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



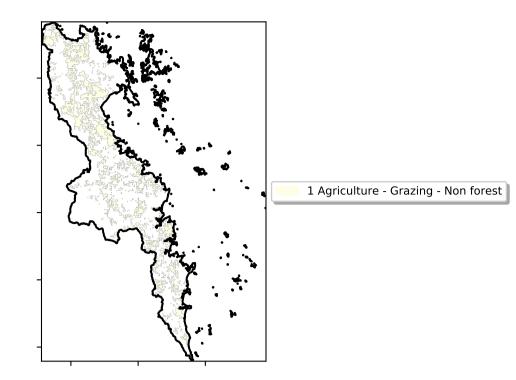




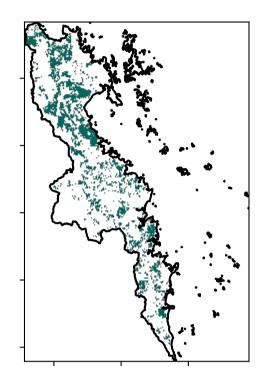


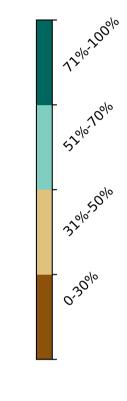
Grazing non forest

Land use and forest cover

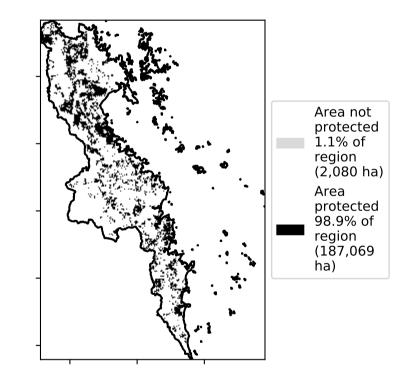


Total Vegetation Cover [%]

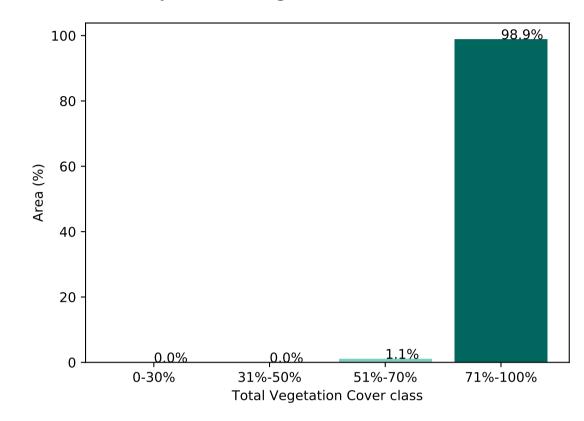




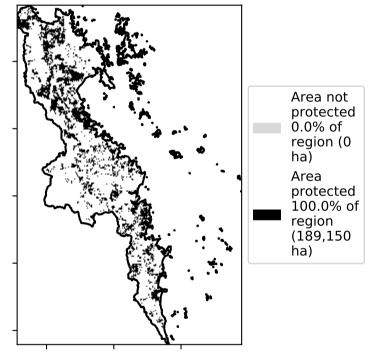
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area

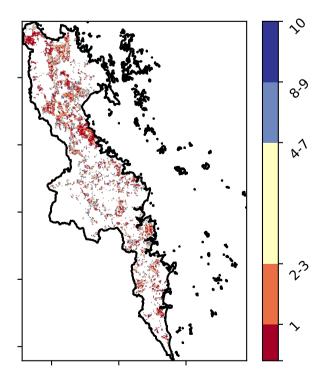


% Area protected from wind erosion (>50%)

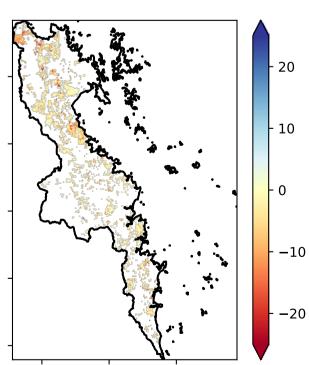


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]

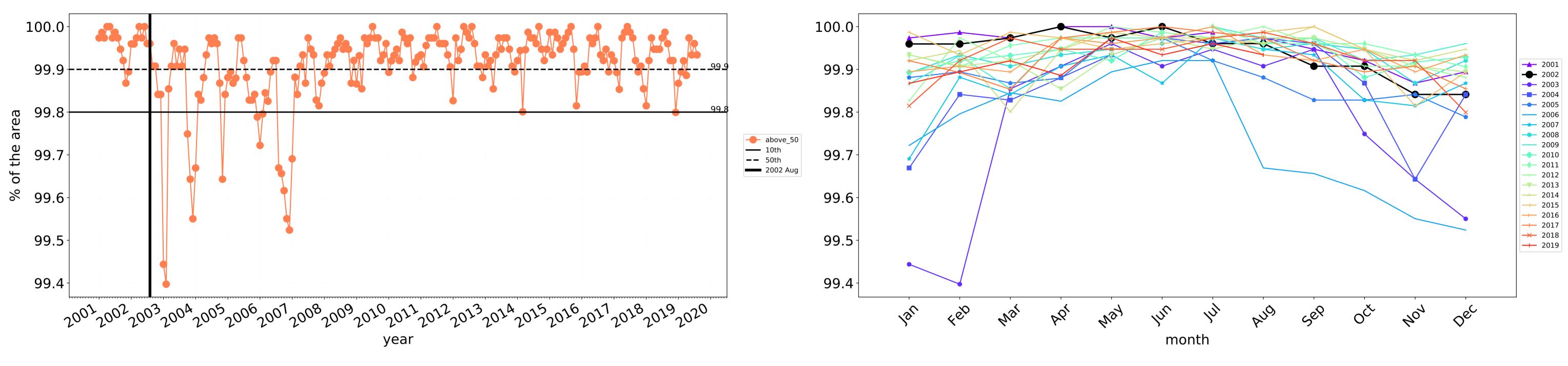


Total Vegetation Cover Anomaly [%]

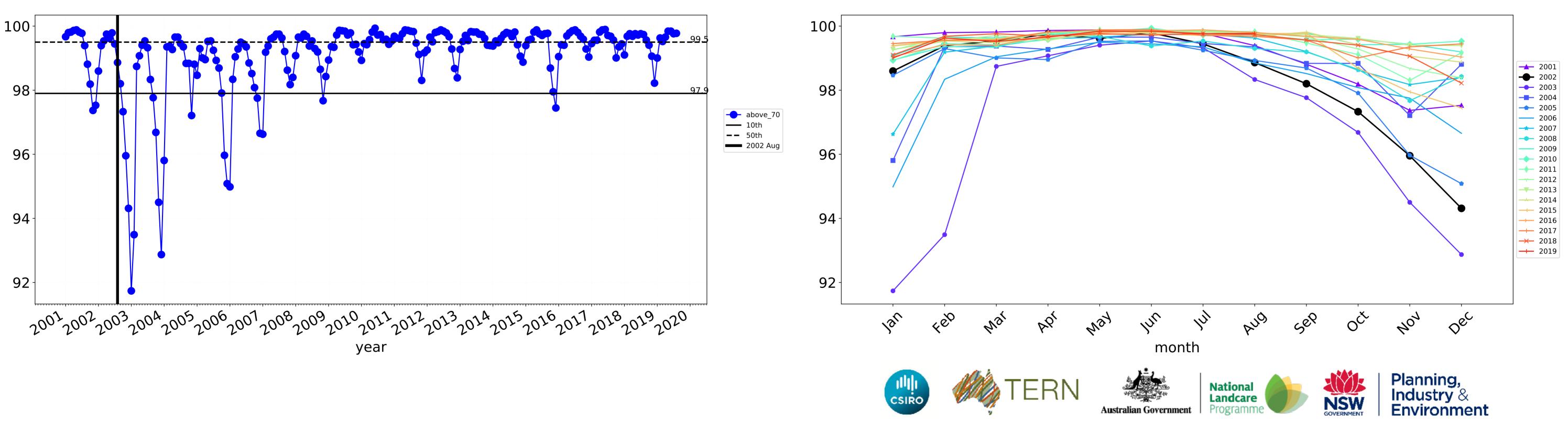


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





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



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

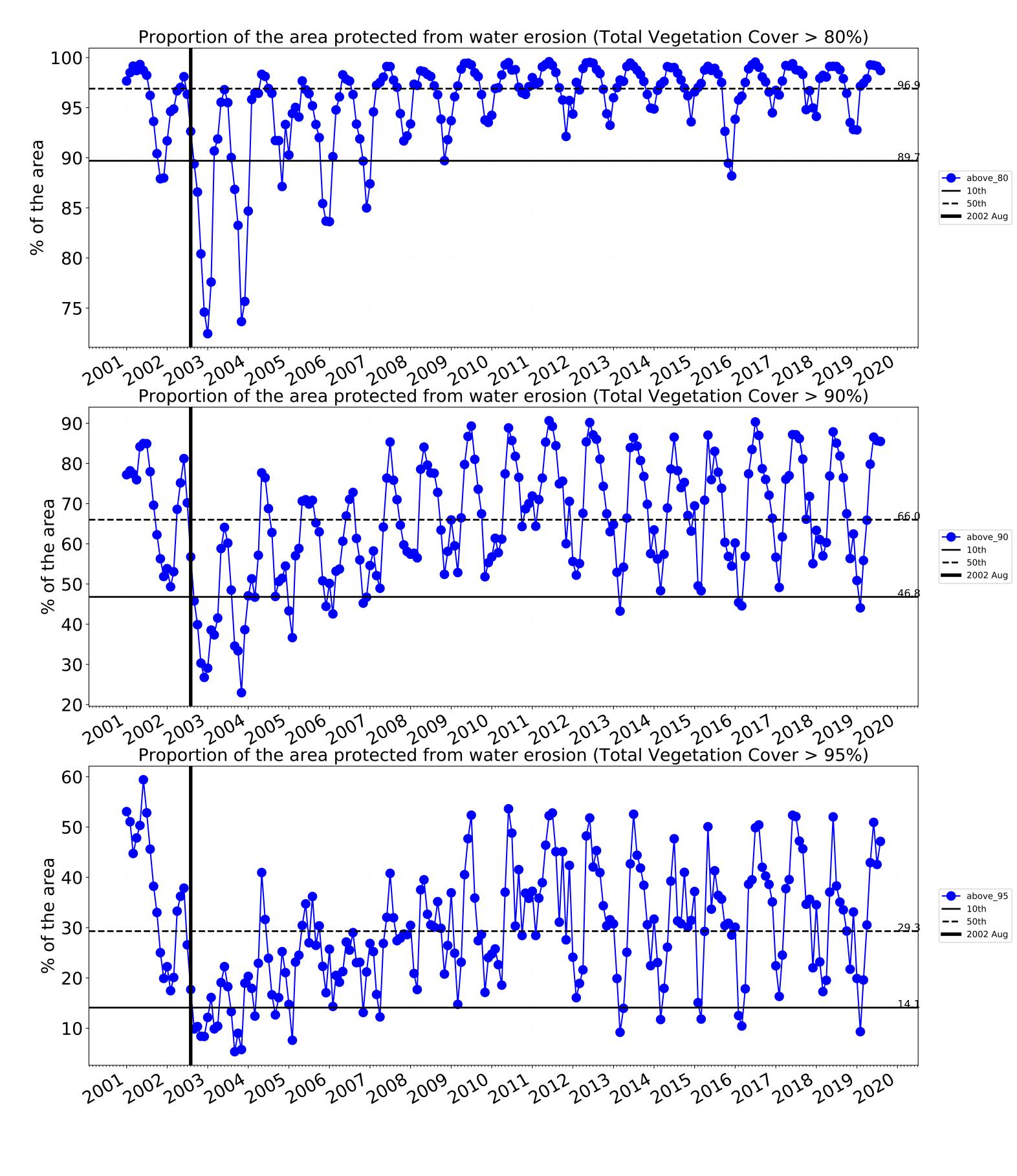
% of the area

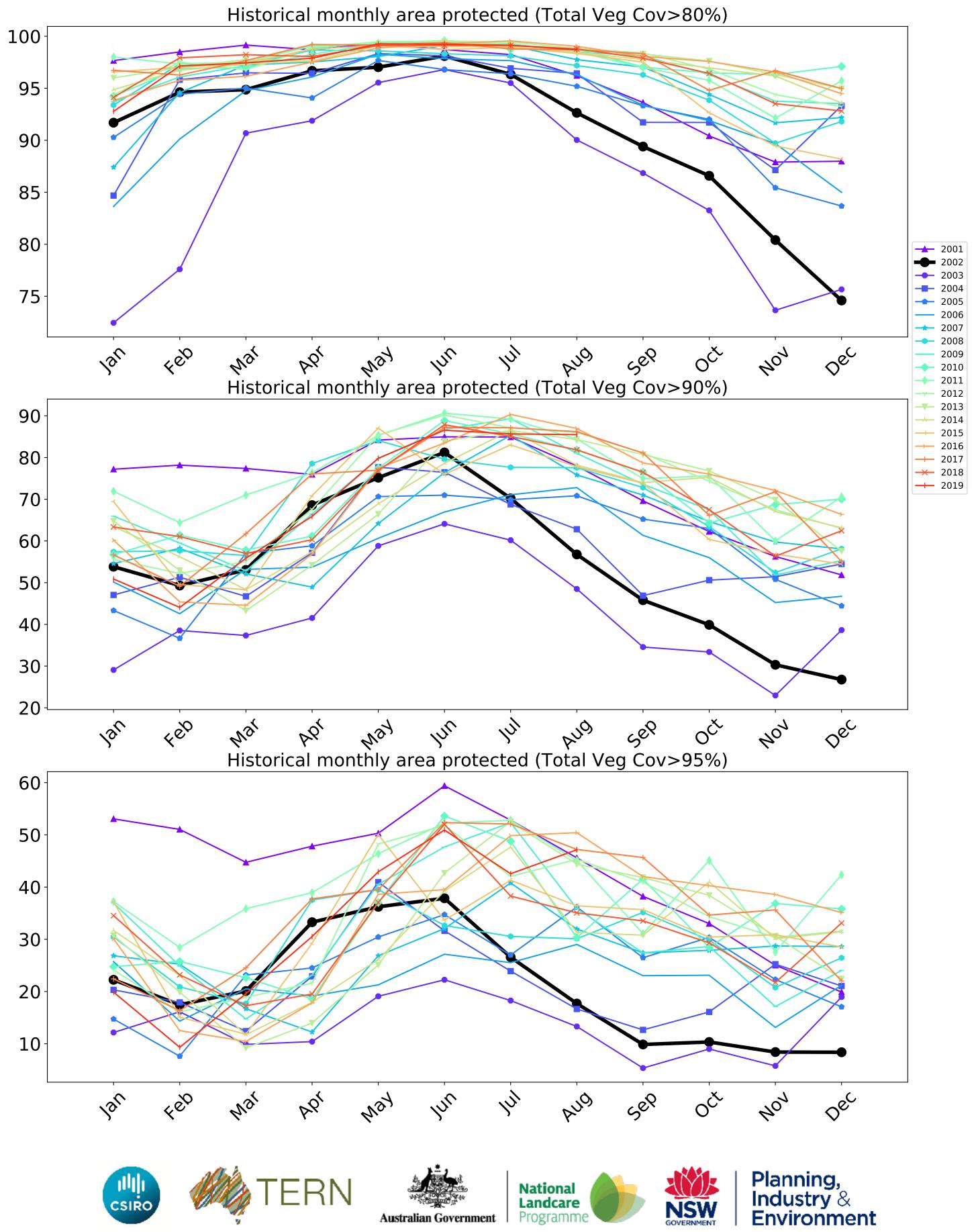
Grazing non forest timeseries



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

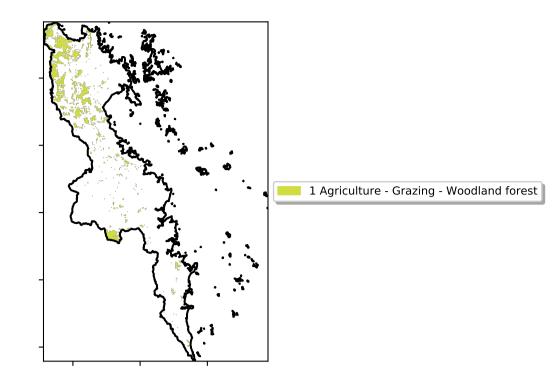




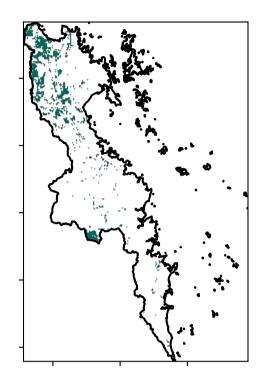


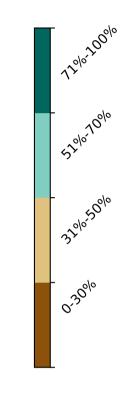
Grazing Woodland forest

Land use and forest cover

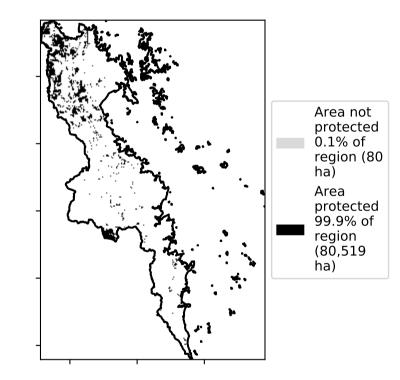


Total Vegetation Cover [%]

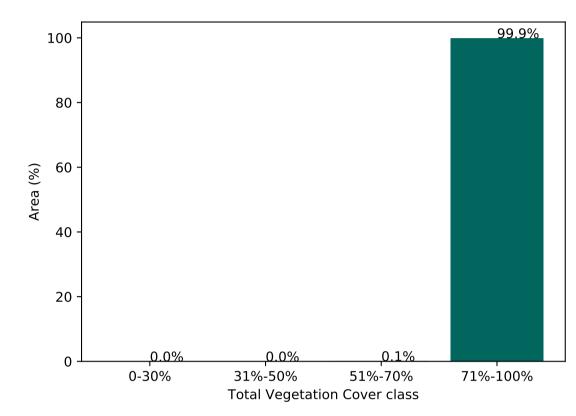




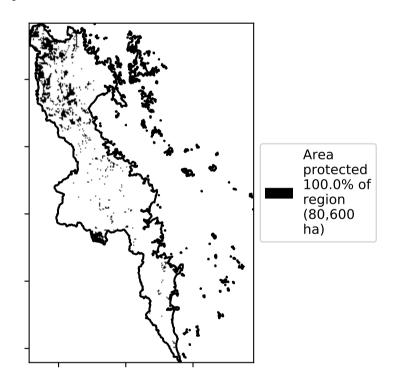
% Area protected from water erosion (>70%)





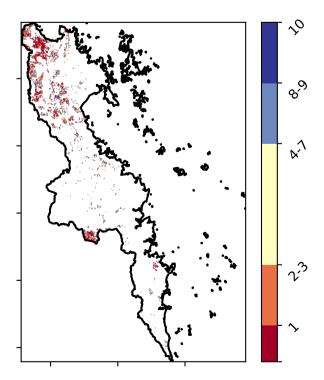


% Area protected from wind erosion (>50%)

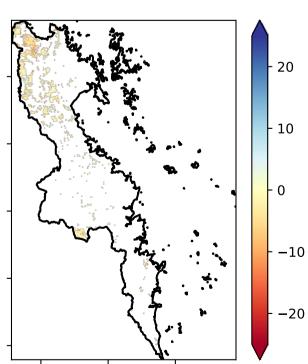


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]

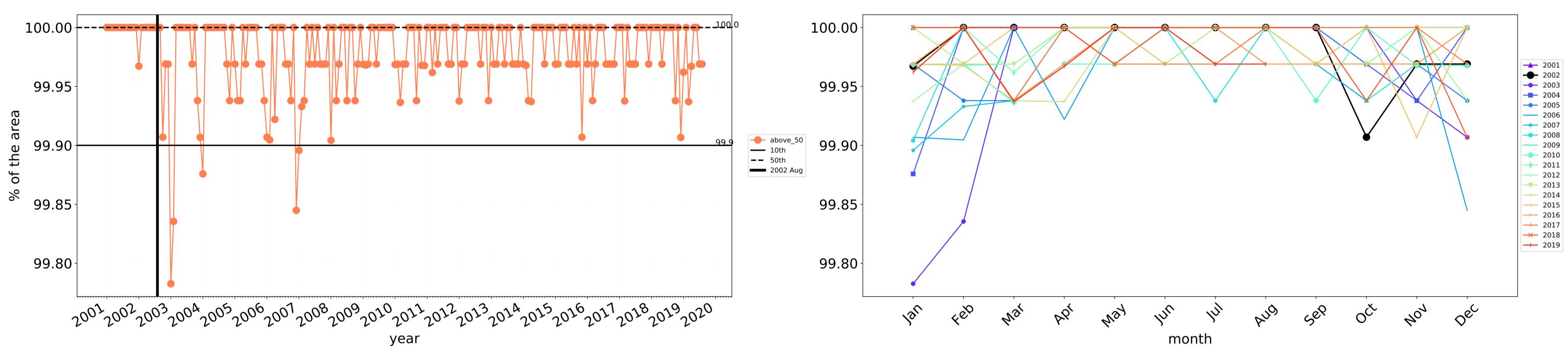


Total Vegetation Cover Anomaly [%]



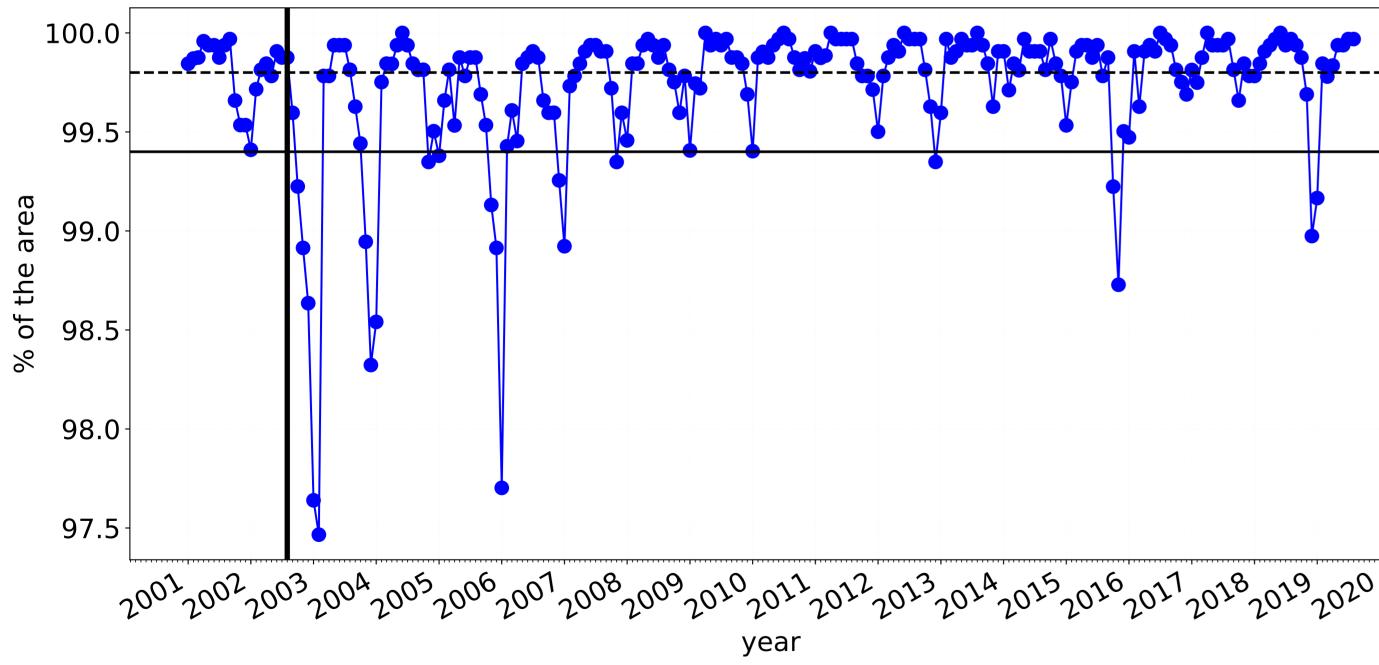
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





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

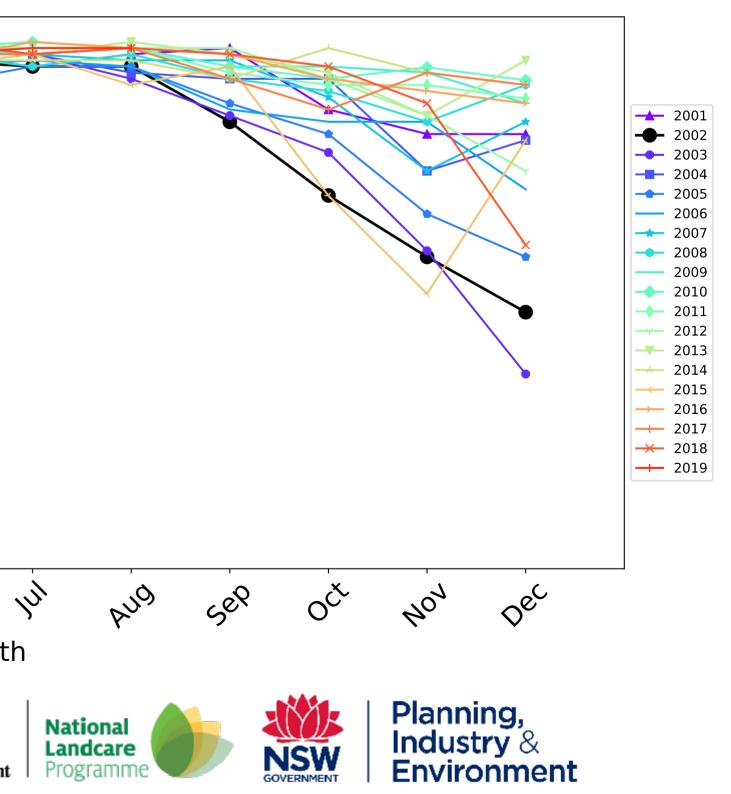
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

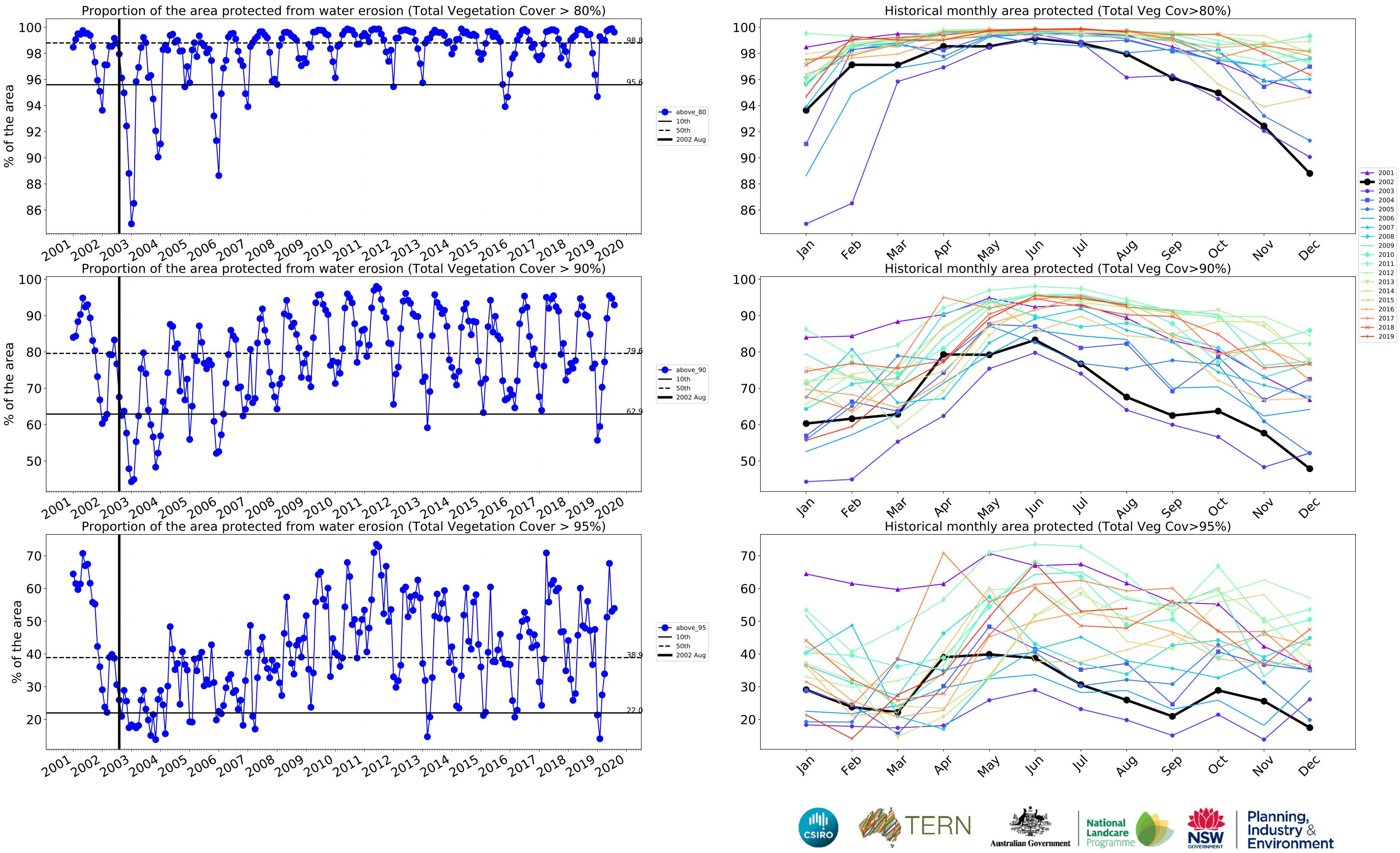


Wind erosion historical monthly area protected (Total Veg Cov >50%)

100.0-99.5 ---- above_70 **—** 10th 99.0 **--** 50th 98.5 98.0 97.5 feb Jan May In Wai PQ month ERN csiro Australian Government

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

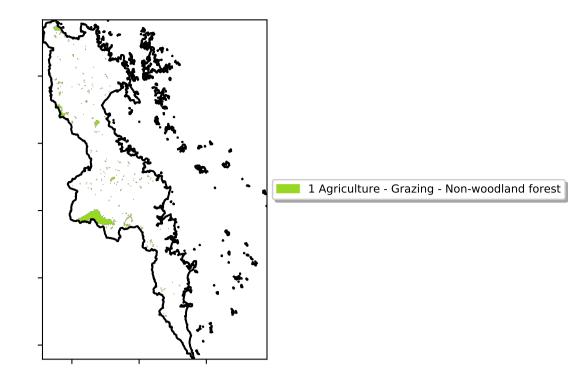




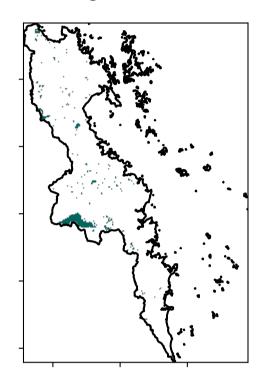


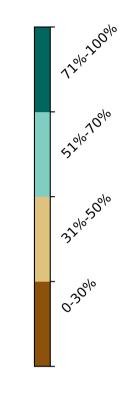
Grazing - Forest (non woodland)

Land use and forest cover

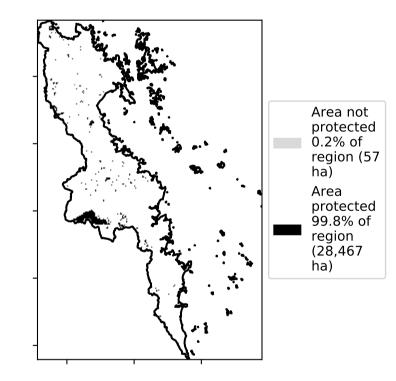


Total Vegetation Cover [%]

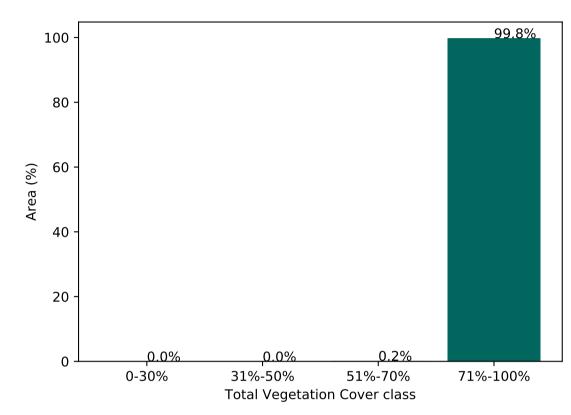




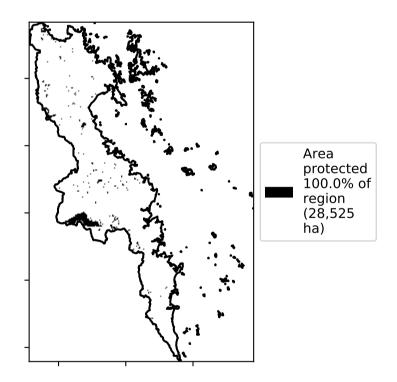
% Area protected from water erosion (>70%)





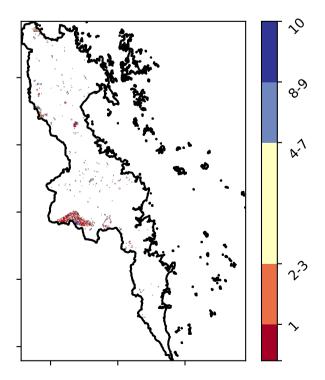


% Area protected from wind erosion (>50%)

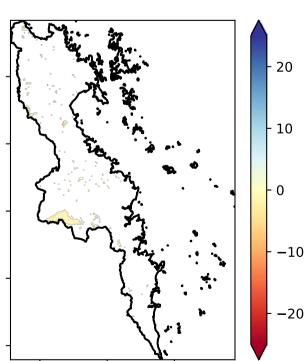


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover Decile [%]

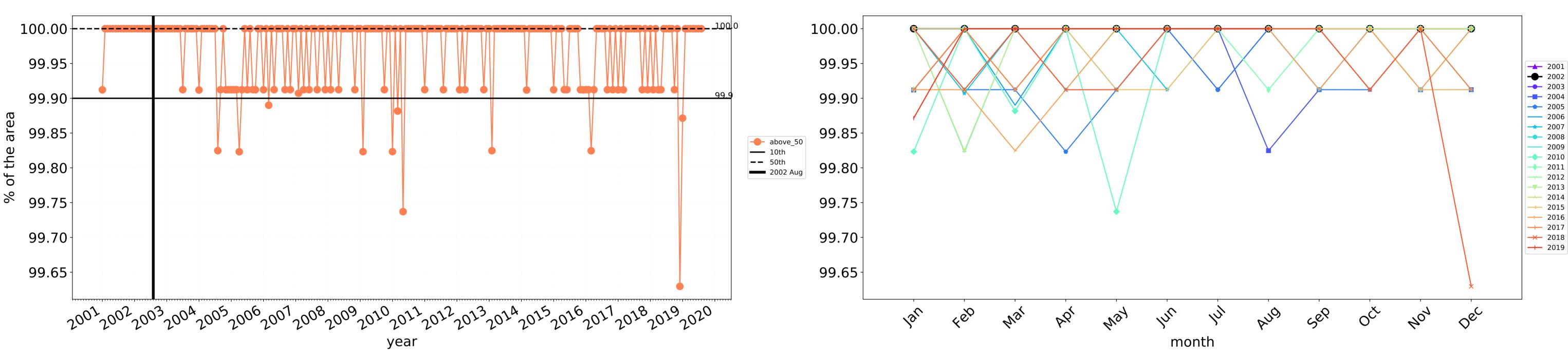


Total Vegetation Cover Anomaly [%]



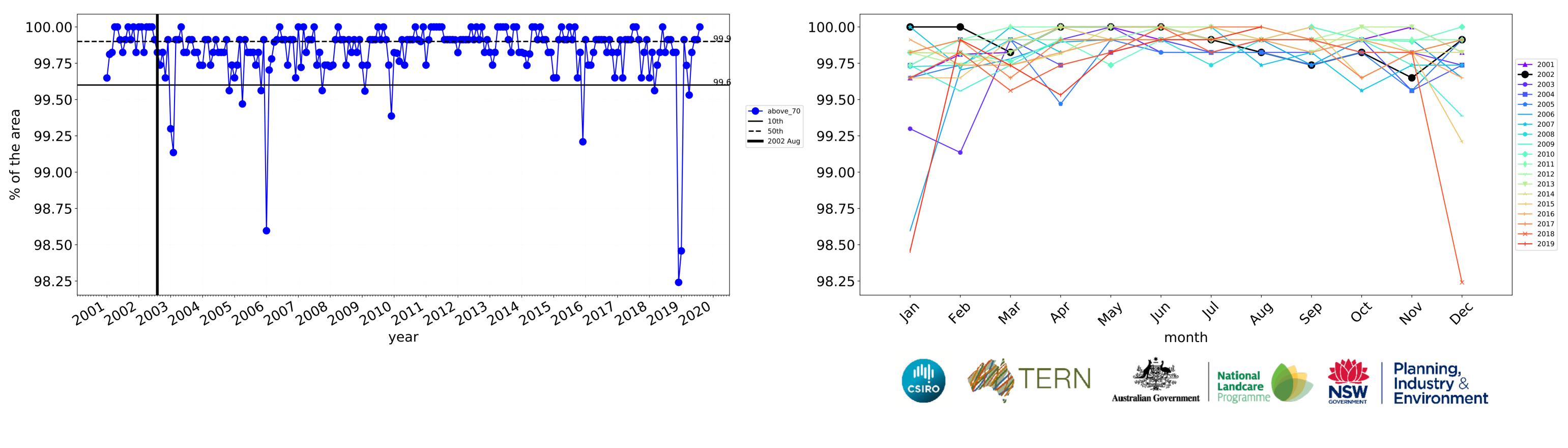
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

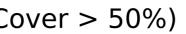




Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

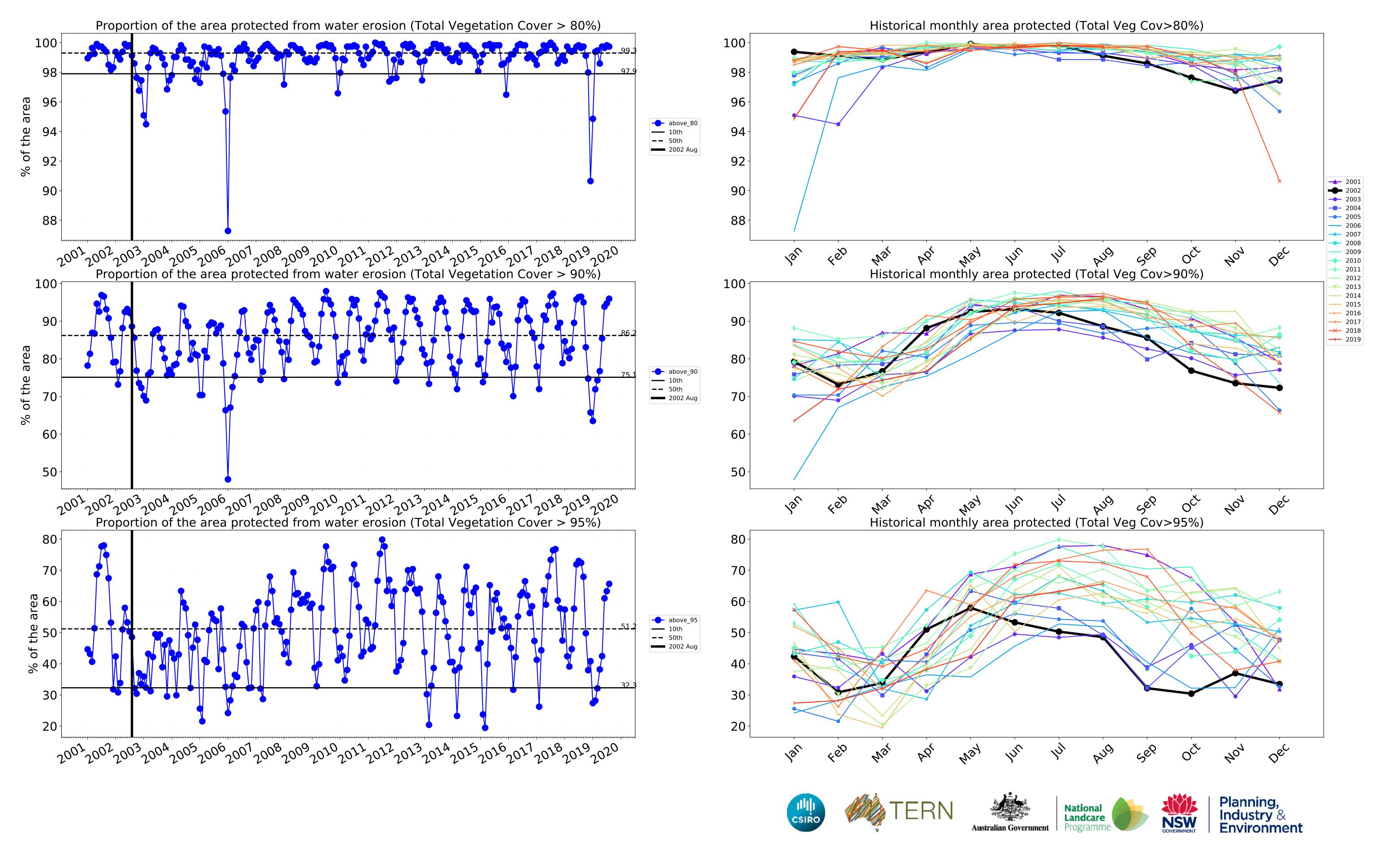
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)





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

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

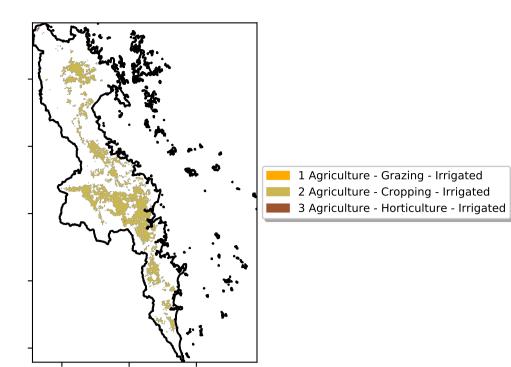


4

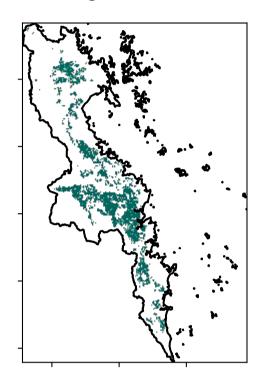
Irrigation

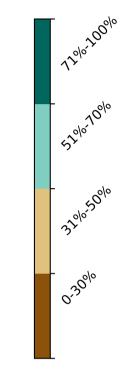
Land use and forest cover

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

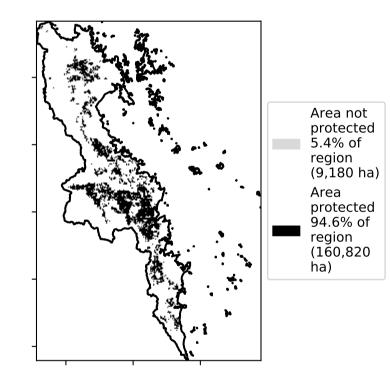


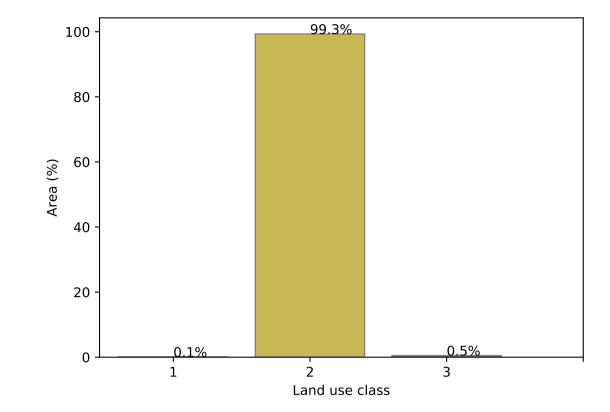
Total Vegetation Cover [%]





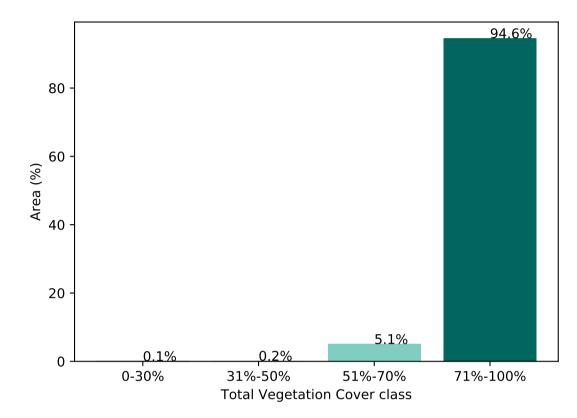
% Area protected from water erosion (>70%)



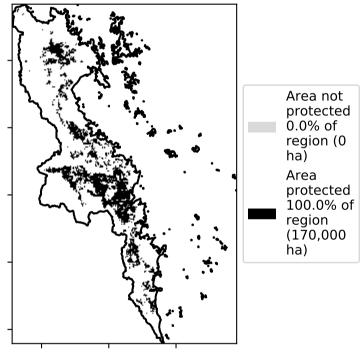


Proportion of each land class in area

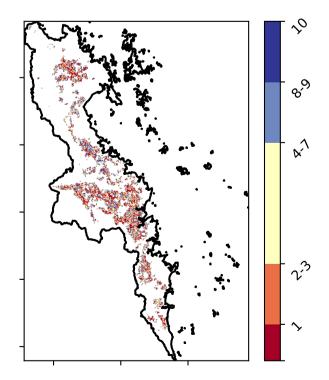
Proportion of vegetation cover class in area



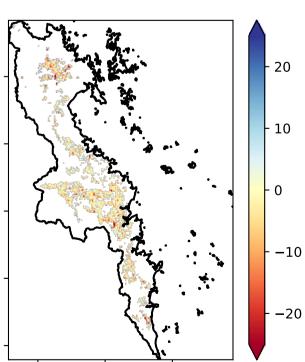
% Area protected from wind erosion (>50%)



Total Vegetation Cover Decile [%]

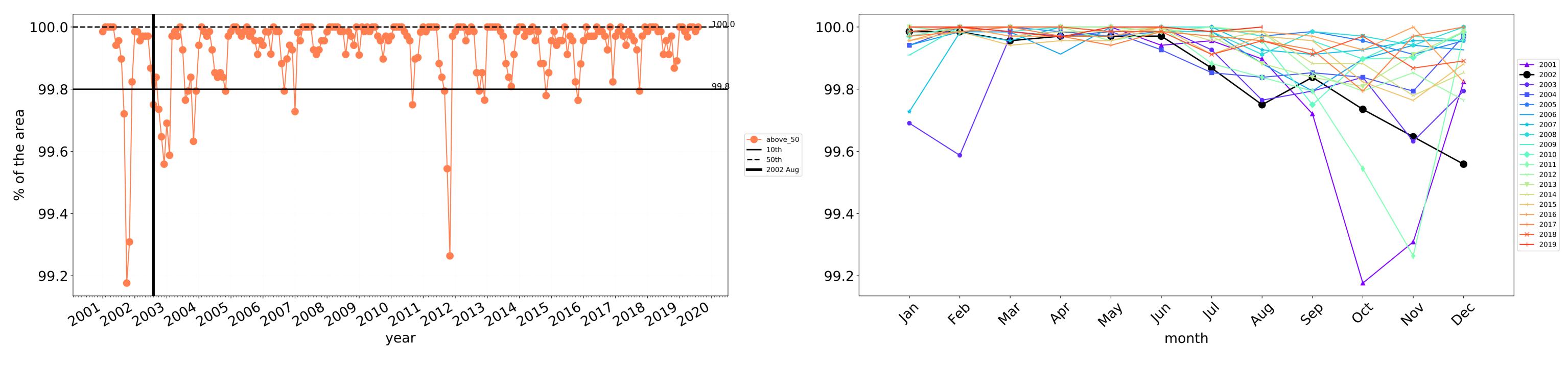


Total Vegetation Cover Anomaly [%]

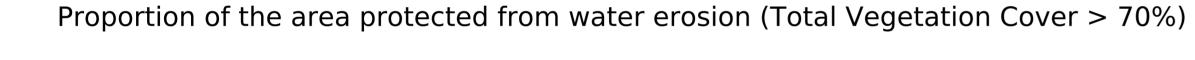


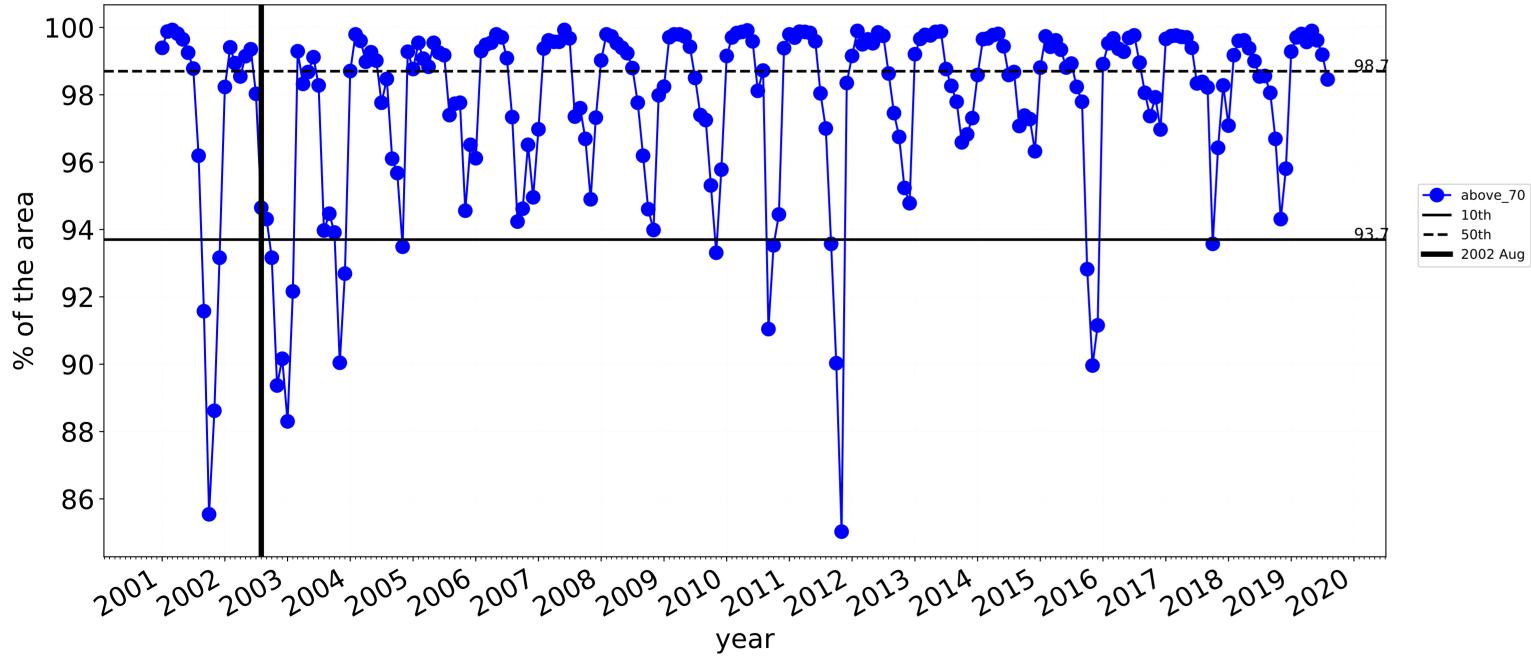
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.





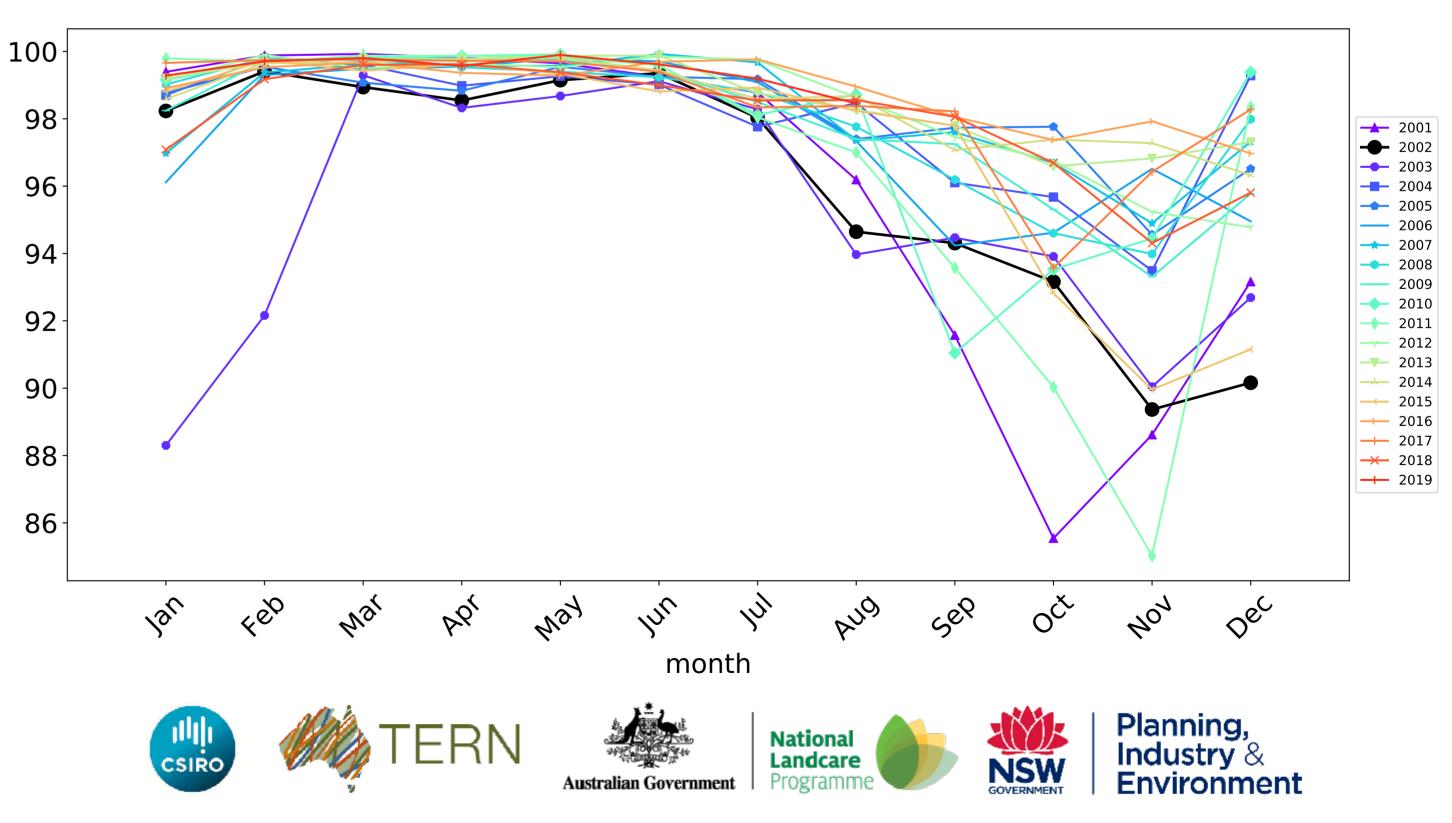
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

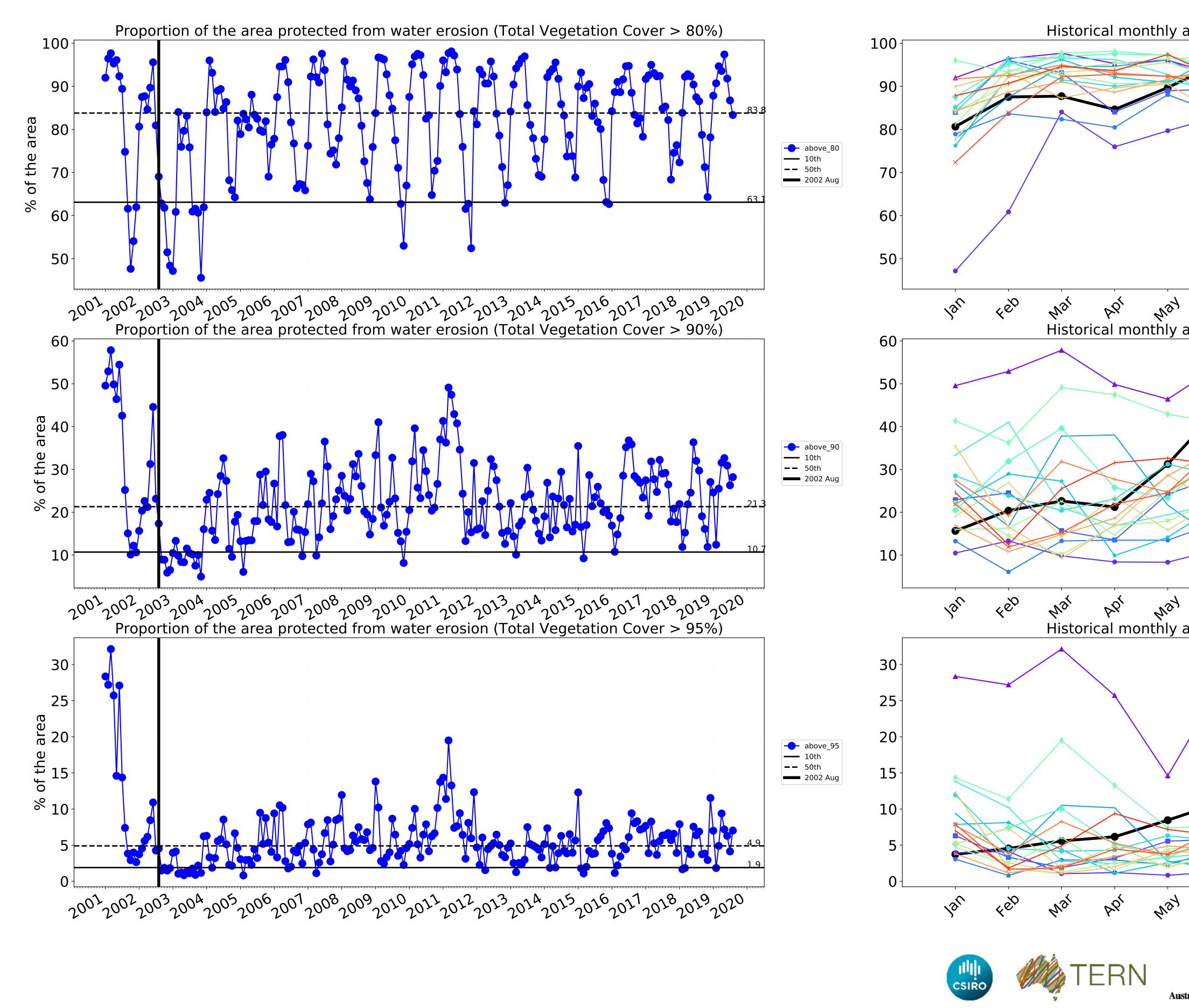




Wind erosion historical monthly area protected (Total Veg Cov >50%)

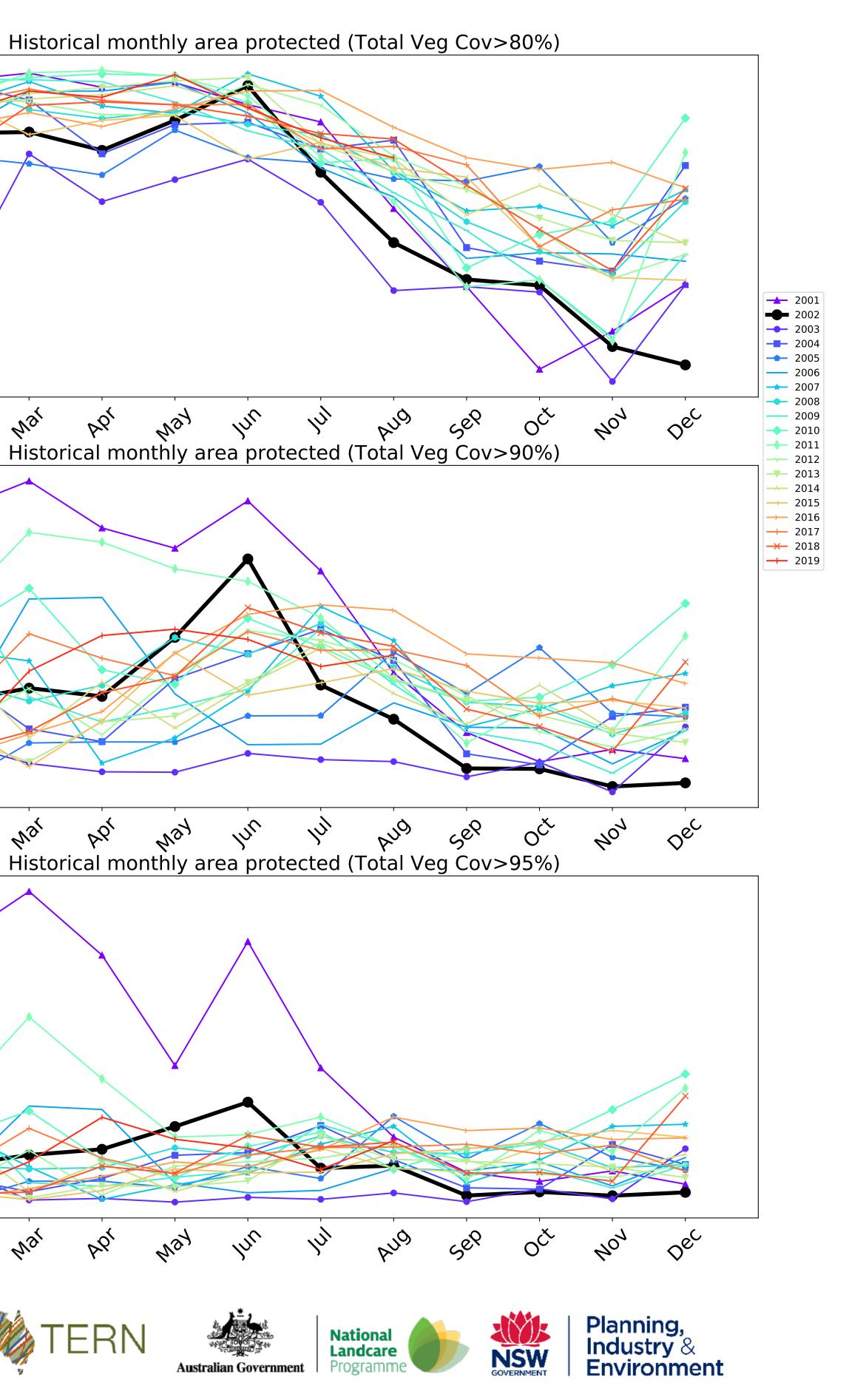
Water erosion historical monthly area protected (Total Veg Cov>70%)





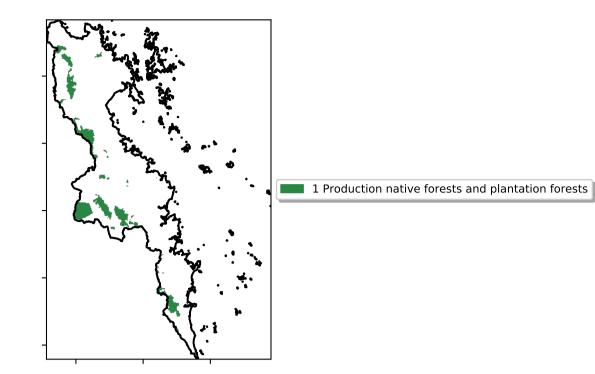
nu

JUJ

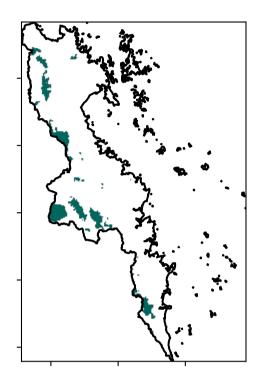


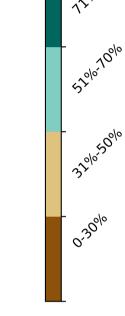
Production native forests and plantation forests

Land use and forest cover

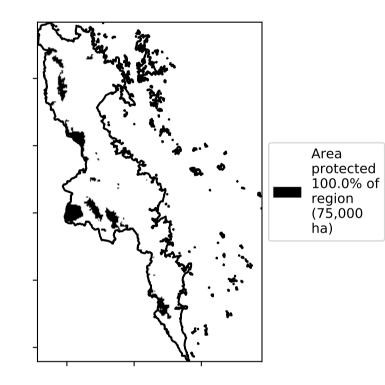


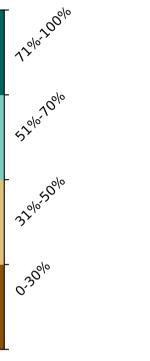
Total Vegetation Cover [%]



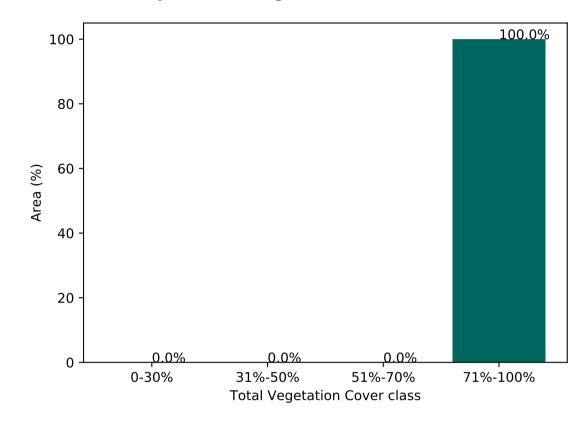


% Area protected from water erosion (>70%)

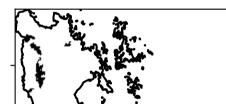




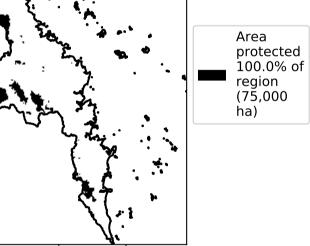
Proportion of vegetation cover class in area



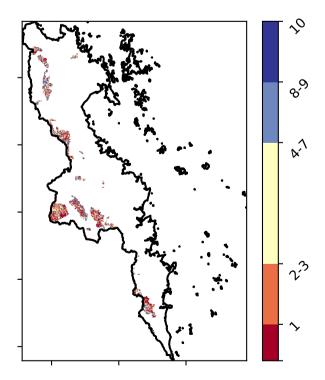
% Area protected from wind erosion (>50%)



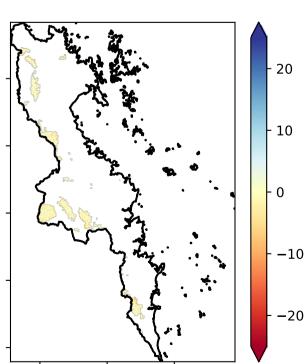
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



Total Vegetation Cover Decile [%]

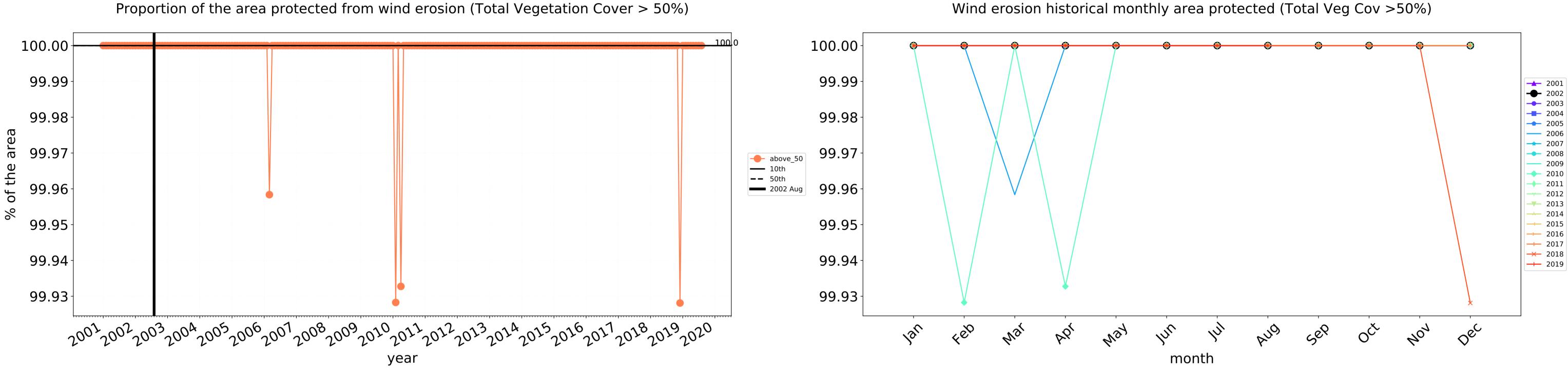


Total Vegetation Cover Anomaly [%]

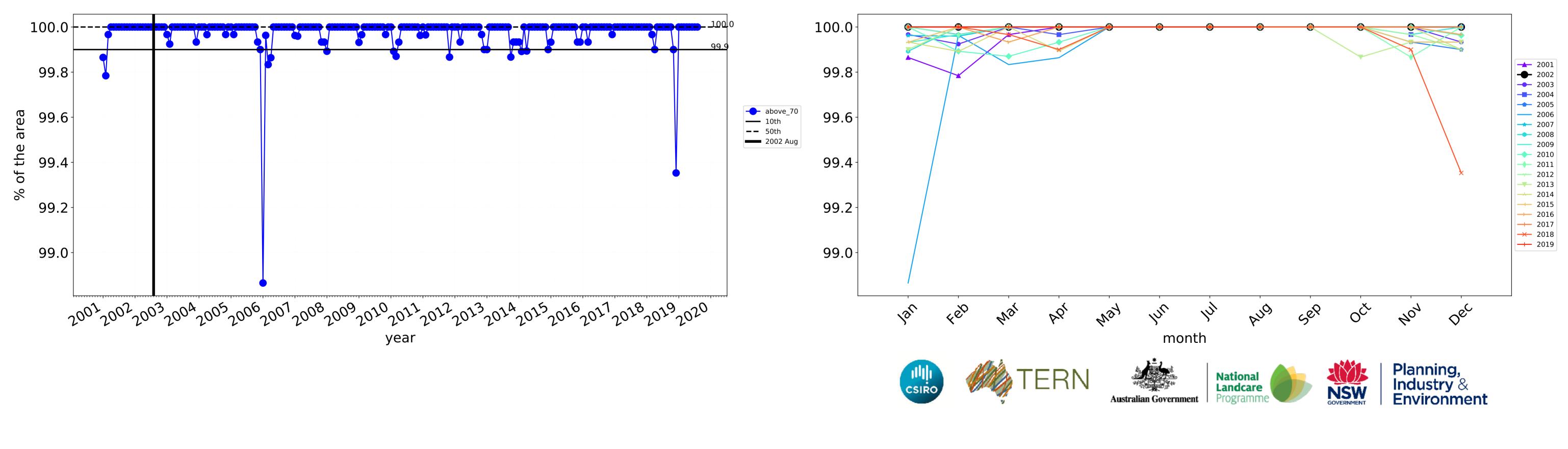


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

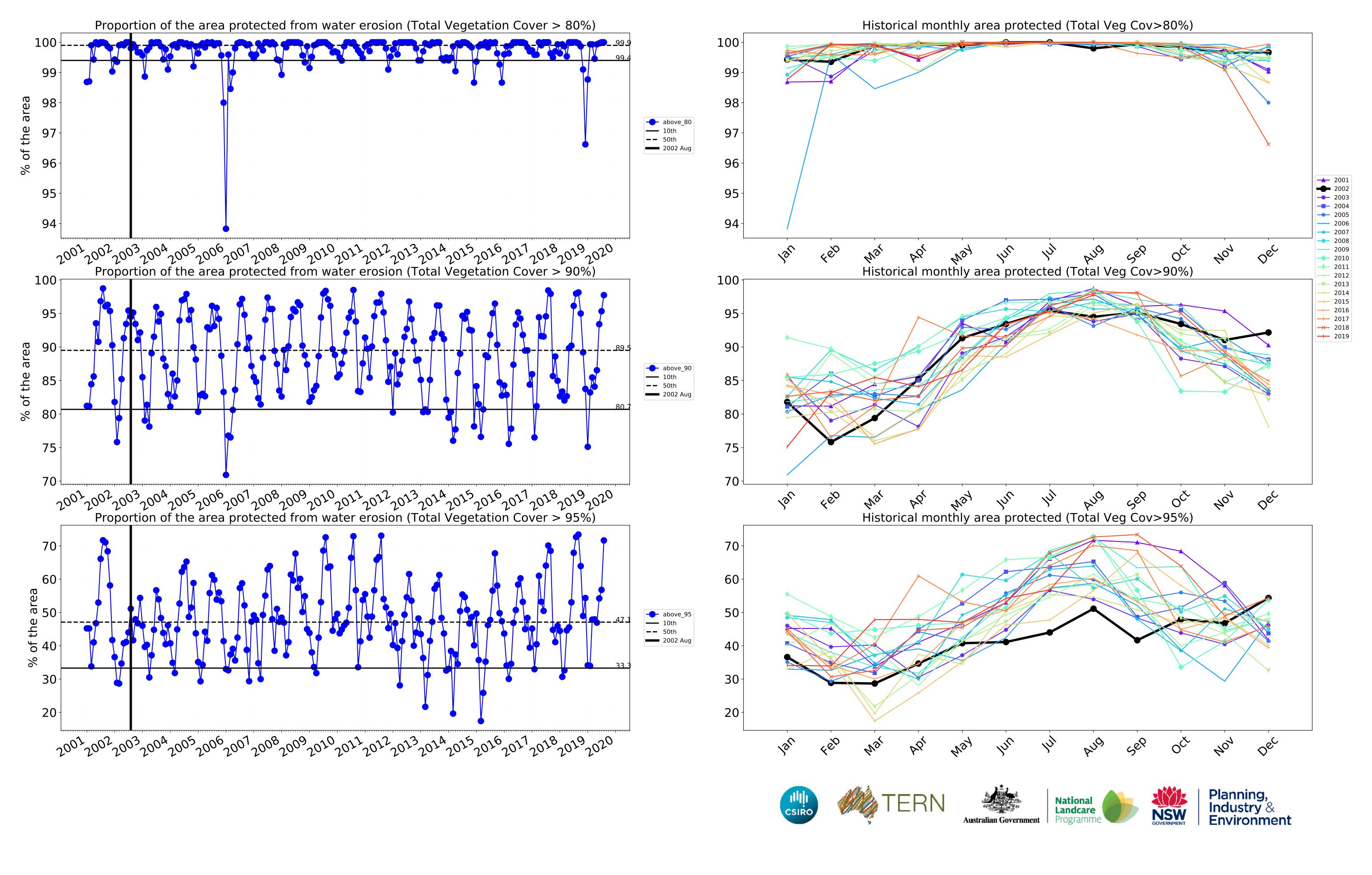




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



Mackay Whitsunday (909,025 ha and no data 24,035 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	909,025	99.9% 908,500	99.8% 907,076	97.9% 889,686	89.1% 809,760	59.0% 536,575	24.5% 222,865
Conservation and natural environments	276,975	99.9% 276,650	99.7% 276,125	99.1% 274,400	97.0% 268,700	80.2% 222,025	36.2% 100,350
Conservation and natural environments non forest	7,350	99.3% 7,300	98.0% 7,200	93.9% 6,900	81.6% 6,000	43.9% 3,225	19.4% 1,425
Conservation and natural environments Woodland forest	75,100	99.9% 75,050	99.8% 74,925	99.4% 74,625	97.3% 73,075	77.4% 58,100	36.7% 27,575
Conservation and natural environments Forest (non woodland)	194,525	99.9% 194,300	99.7% 194,000	99.2% 192,875	97.5% 189,625	82.6% 160,700	36.7% 71,350
Agriculture	468,325	100.0% 468,325	99.9% 467,825	97.6% 456,925	85.4% 399,875	46.3% 216,650	16.2% 75,900
Grazing	298,275	100.0% 298,275	100.0% 298,200	99.2% 295,975	94.7% 282,450	62.7% 187,125	22.9% 68,225
Grazing non forest	189,150	100.0% 189,150	100.0% 189,075	98.9% 187,000	92.6% 175,225	56.8% 107,375	17.7% 33,475
Grazing Woodland forest	80,600	100.0% 80,600	100.0% 80,600	99.9% 80,500	98.0% 78,950	67.6% 54,475	25.9% 20,900
Grazing - Forest (non woodland)	28,525	100.0% 28,525	100.0% 28,525	99.8% 28,475	99.1% 28,275	88.6% 25,275	48.6% 13,850
Irrigation	170,000	100.0% 170,000	99.8% 169,575	94.6% 160,900	69.0% 117,375	17.3% 29,475	4.5% 7,675
Production native forests and plantation forests	75,000	100.0% 75,000	100.0% 75,000	100.0% 75,000	99.8% 74,850	94.5% 70,875	51.1% 38,350

