## **Total vegetation cover soil protection Region:NRM Hunter NSW**

## **Date: February 2002**

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:

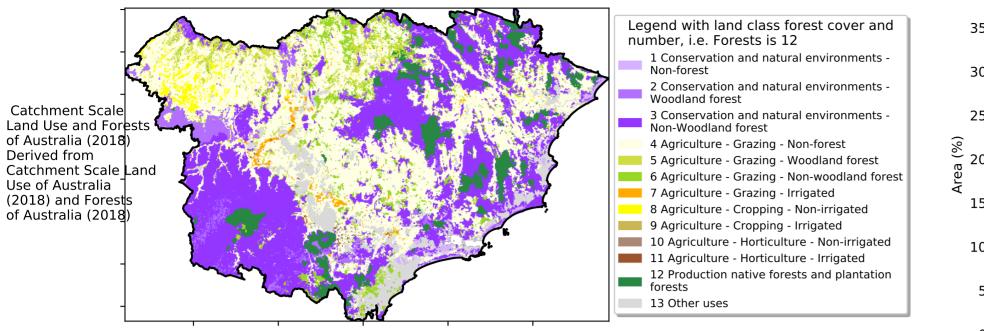
https://doi.org/10.4225/08/5848a3f19a7b3



## **Vegetation Cover Feb 2002**

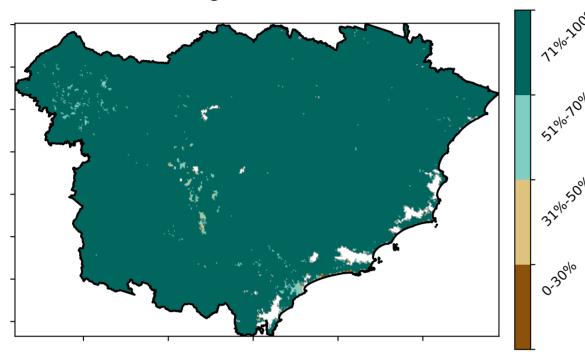
#### Land use and forest cover

Proportion of each land class in area

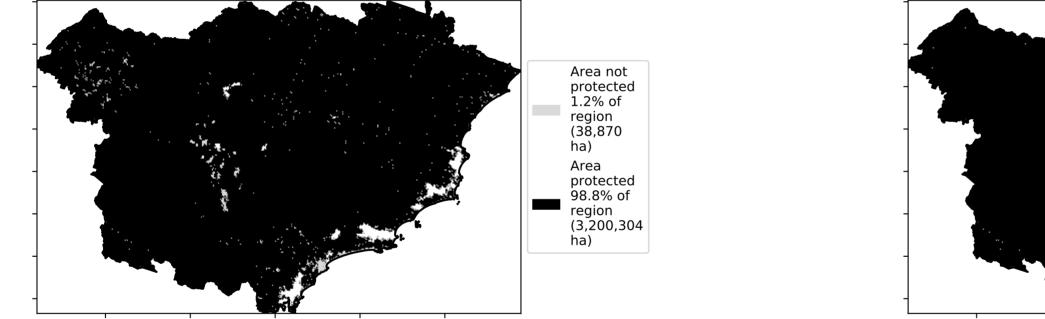


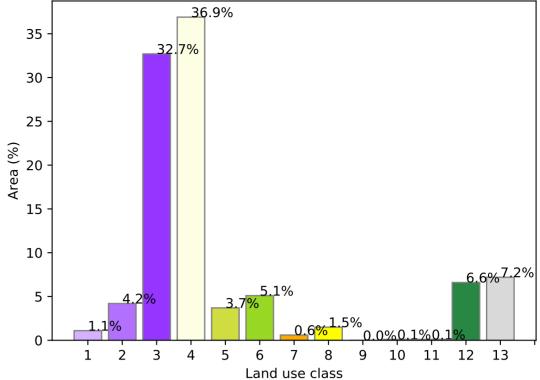


**Total Vegetation Cover [%]** 

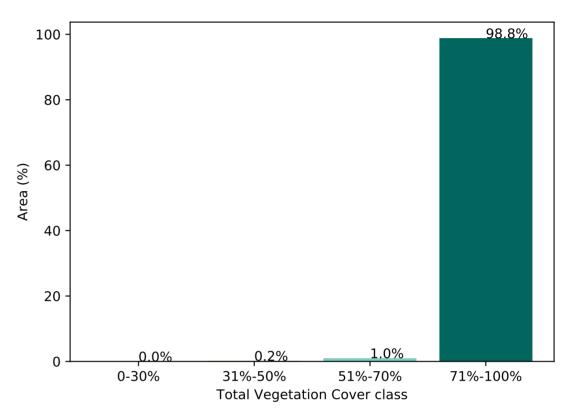


% Area protected from water erosion (>70%)





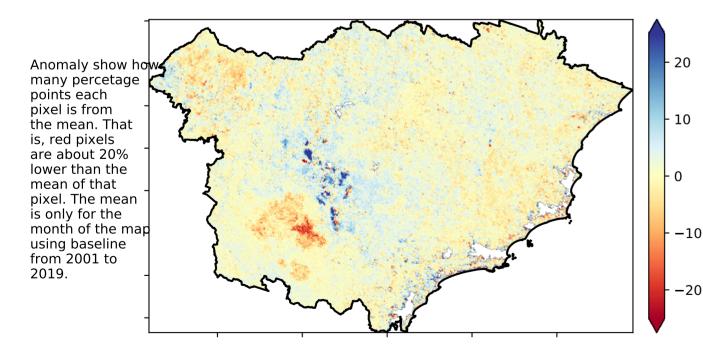
#### Proportion of vegetation cover class in area



#### % Area protected from wind erosion (>50%)

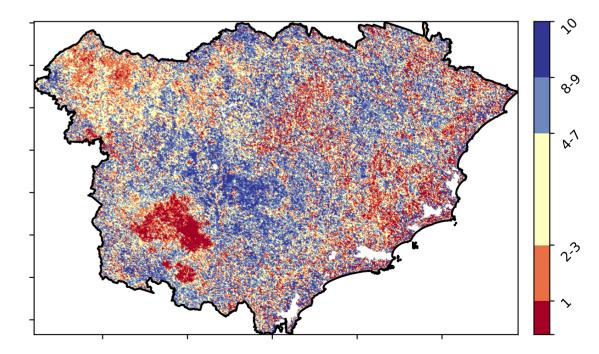


**Total Vegetation Cover Anomaly [%]** 

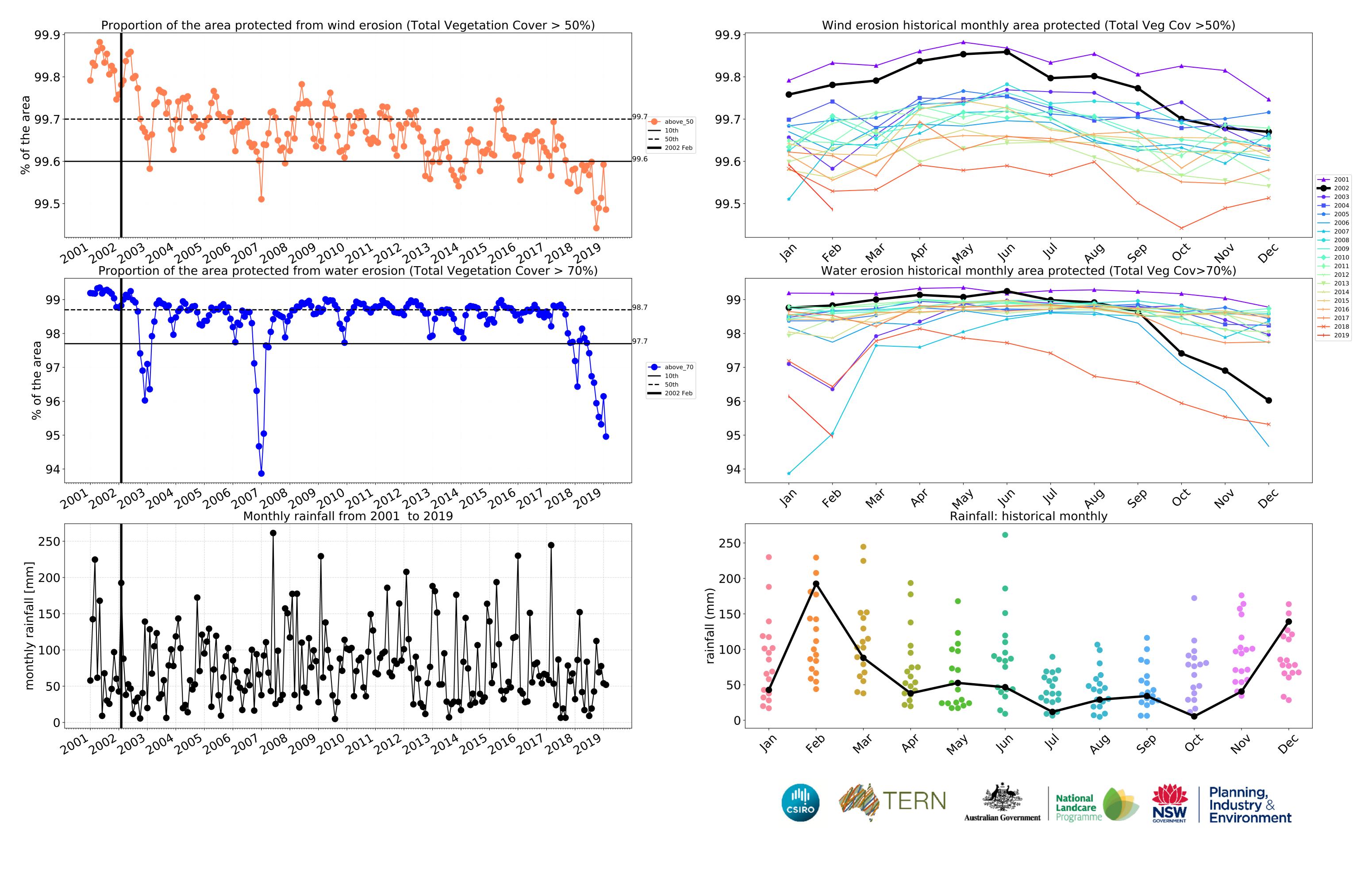


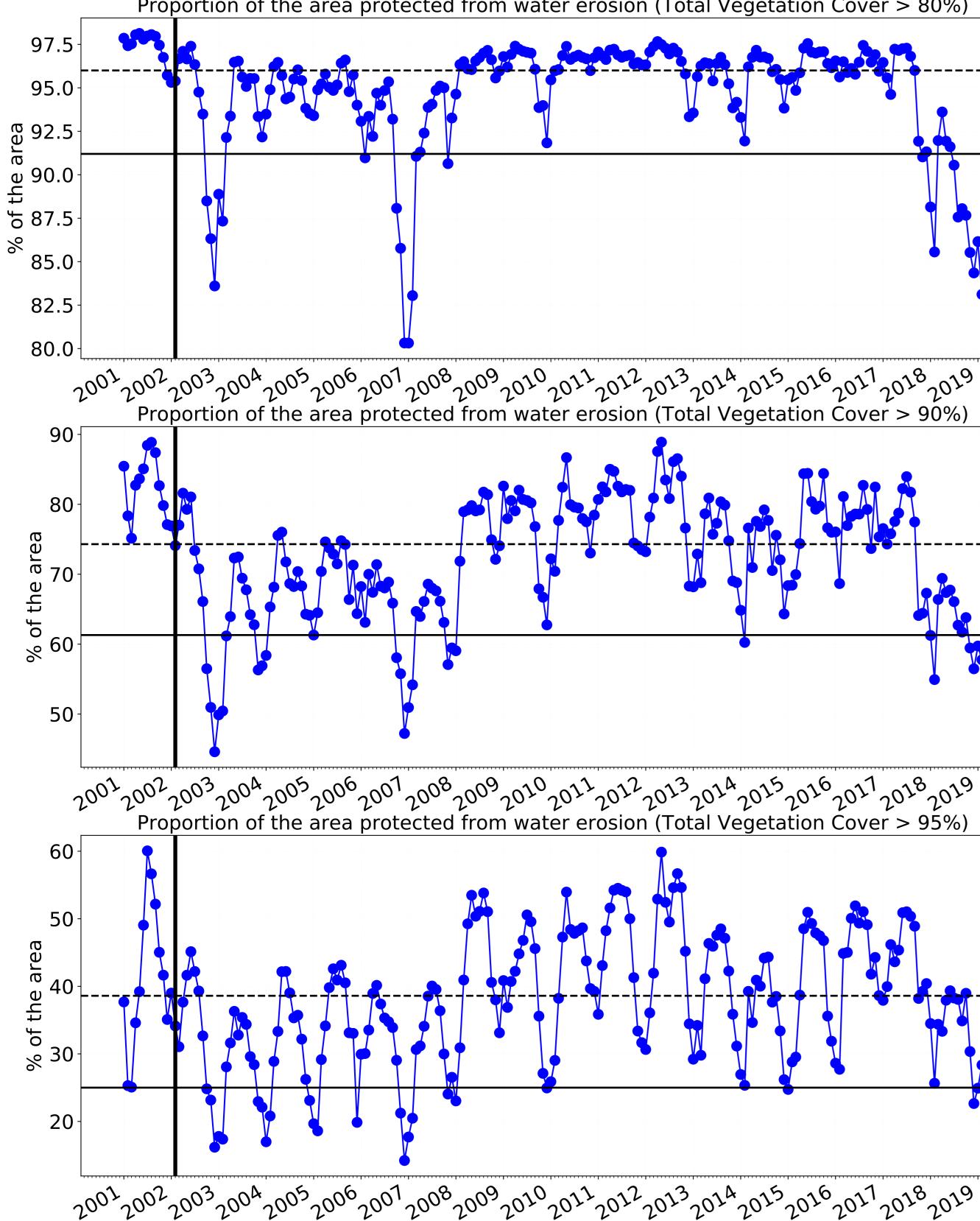
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

**Total Vegetation Cover Decile [%]** 

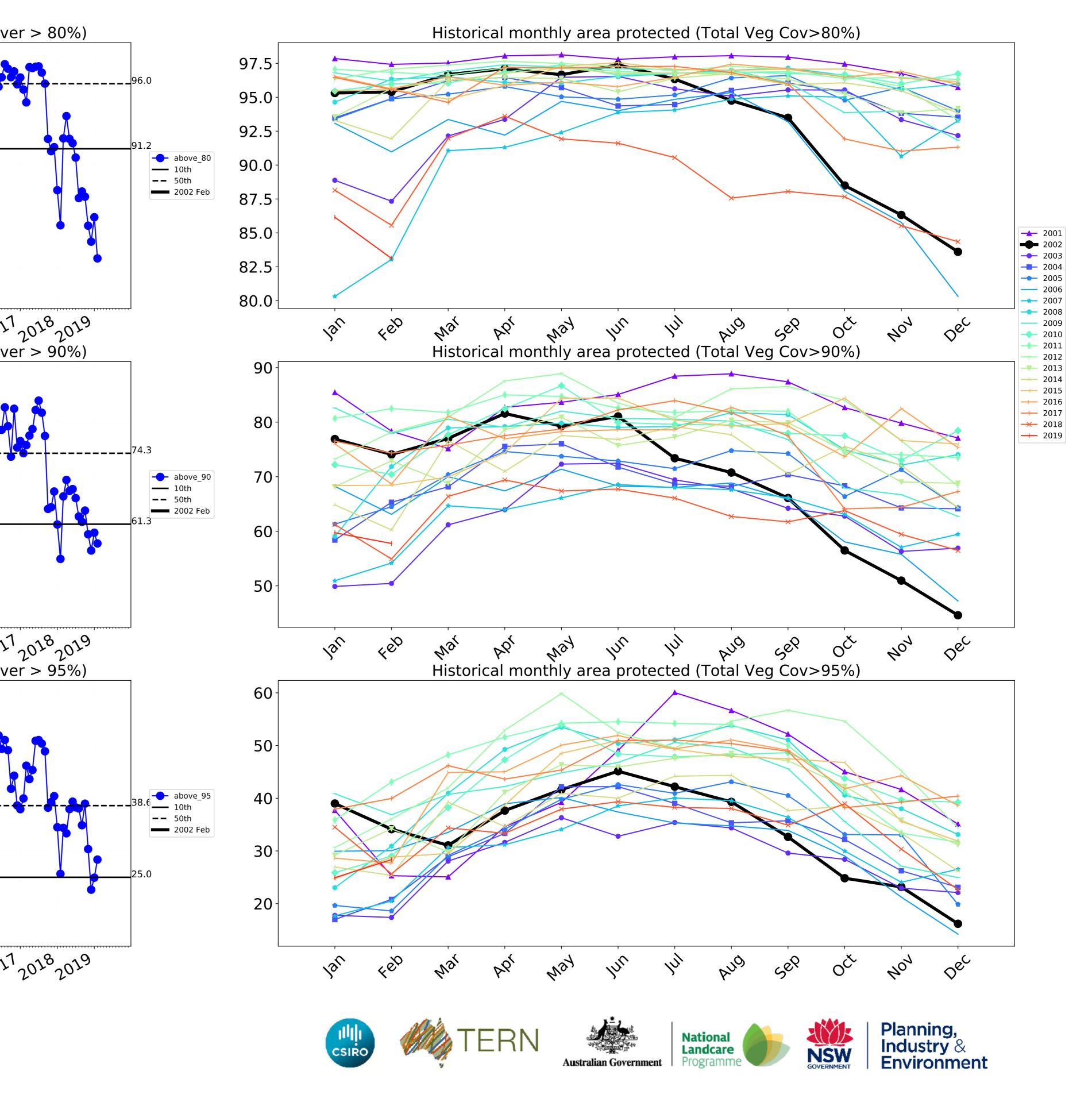




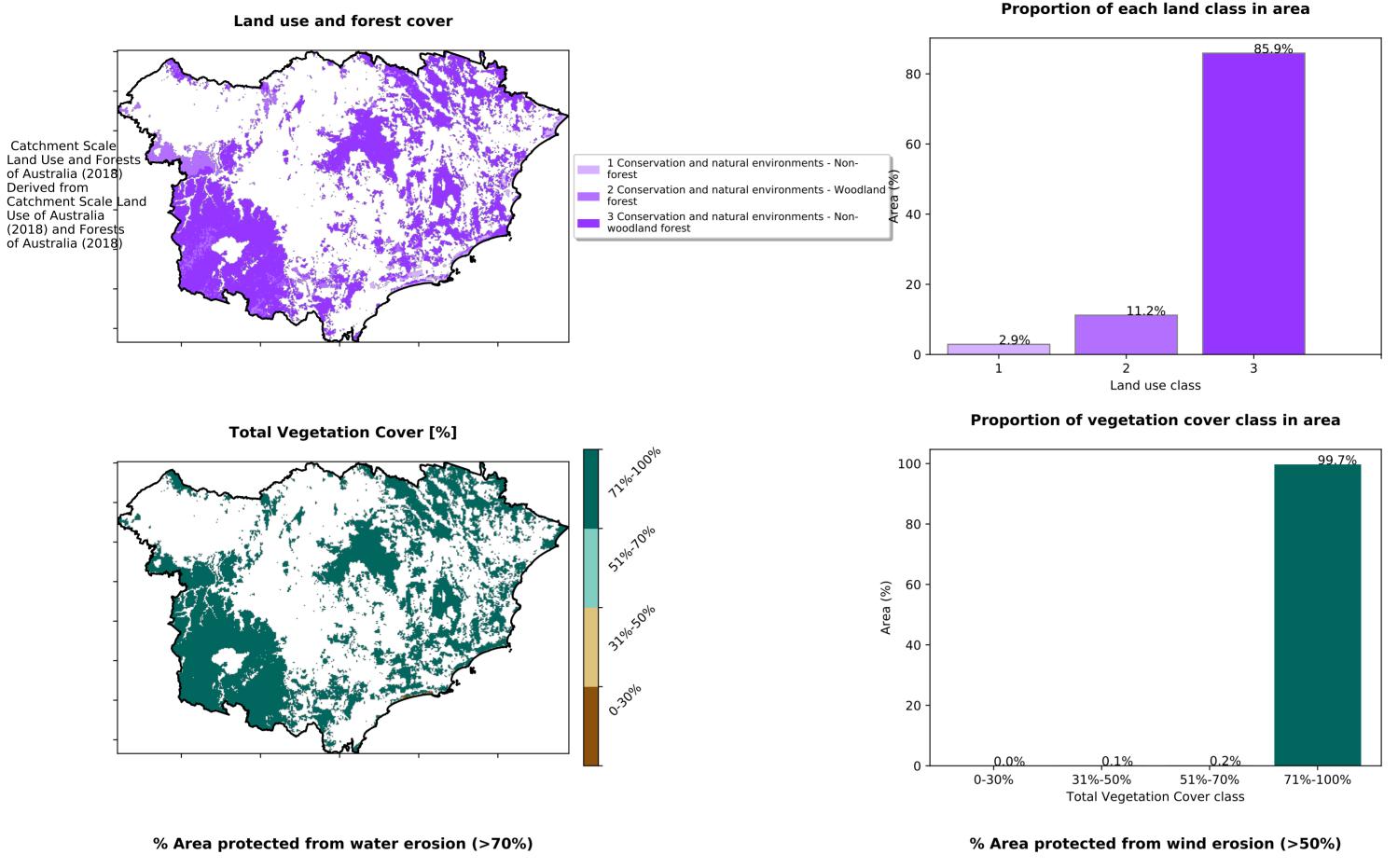


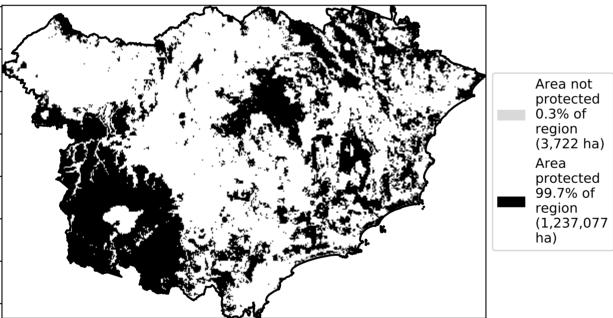


Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



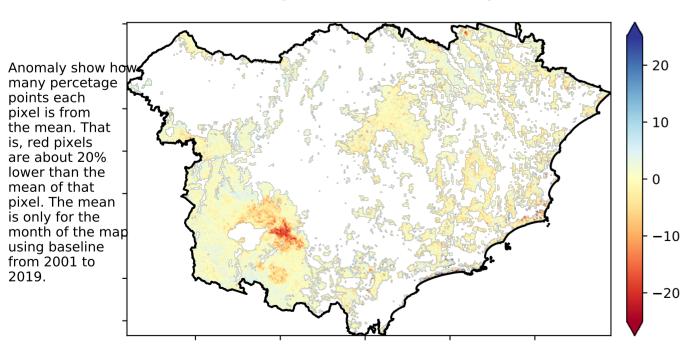
#### **Conservation and natural environments**





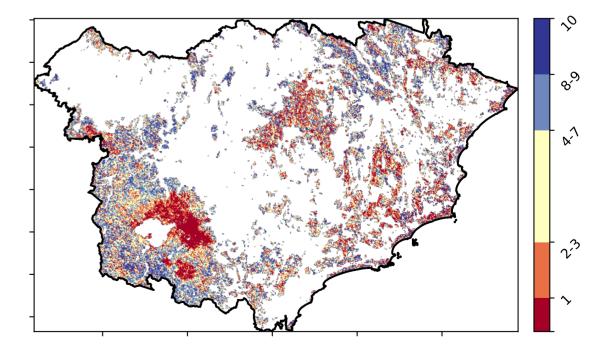


**Total Vegetation Cover Anomaly [%]** 

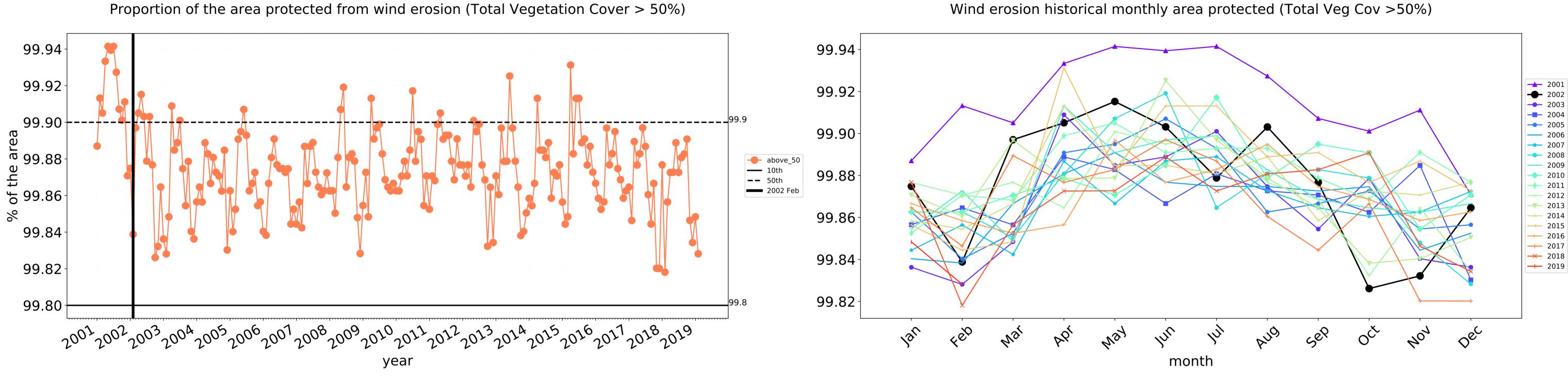


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

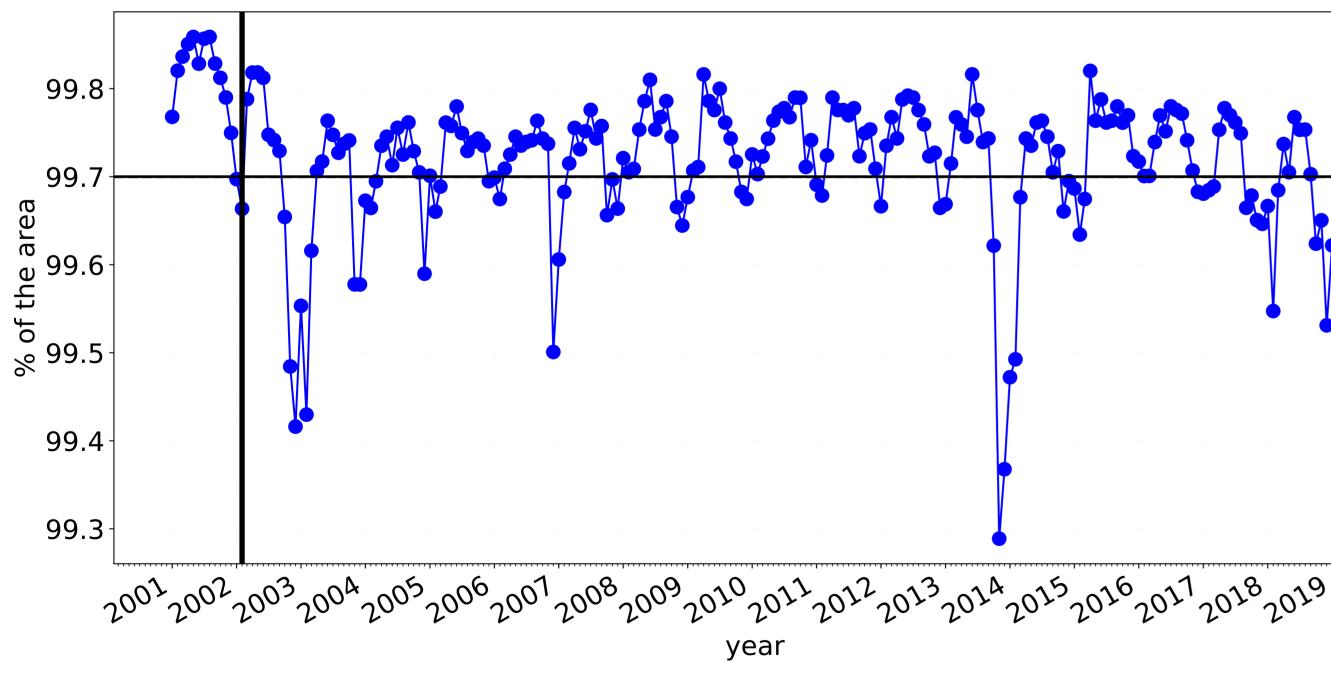






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

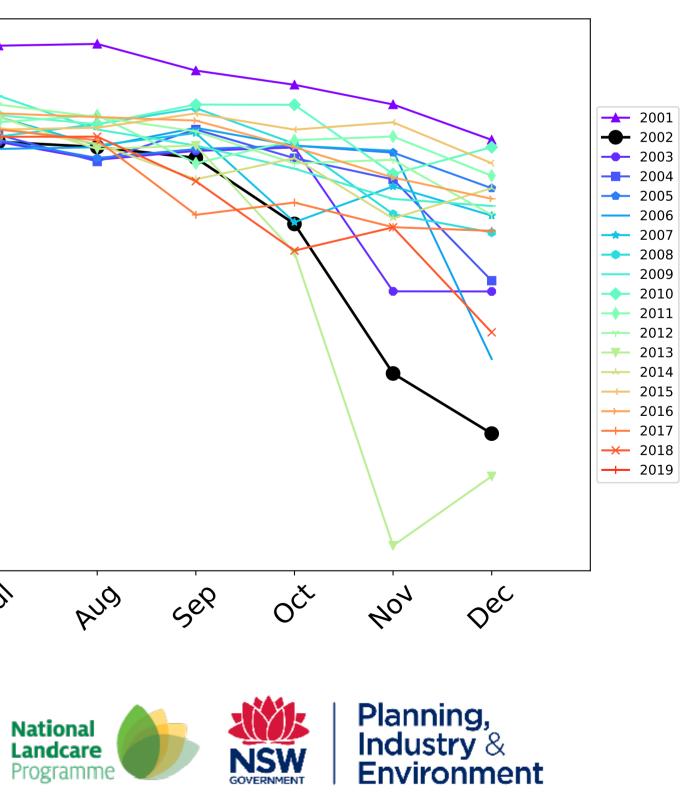
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

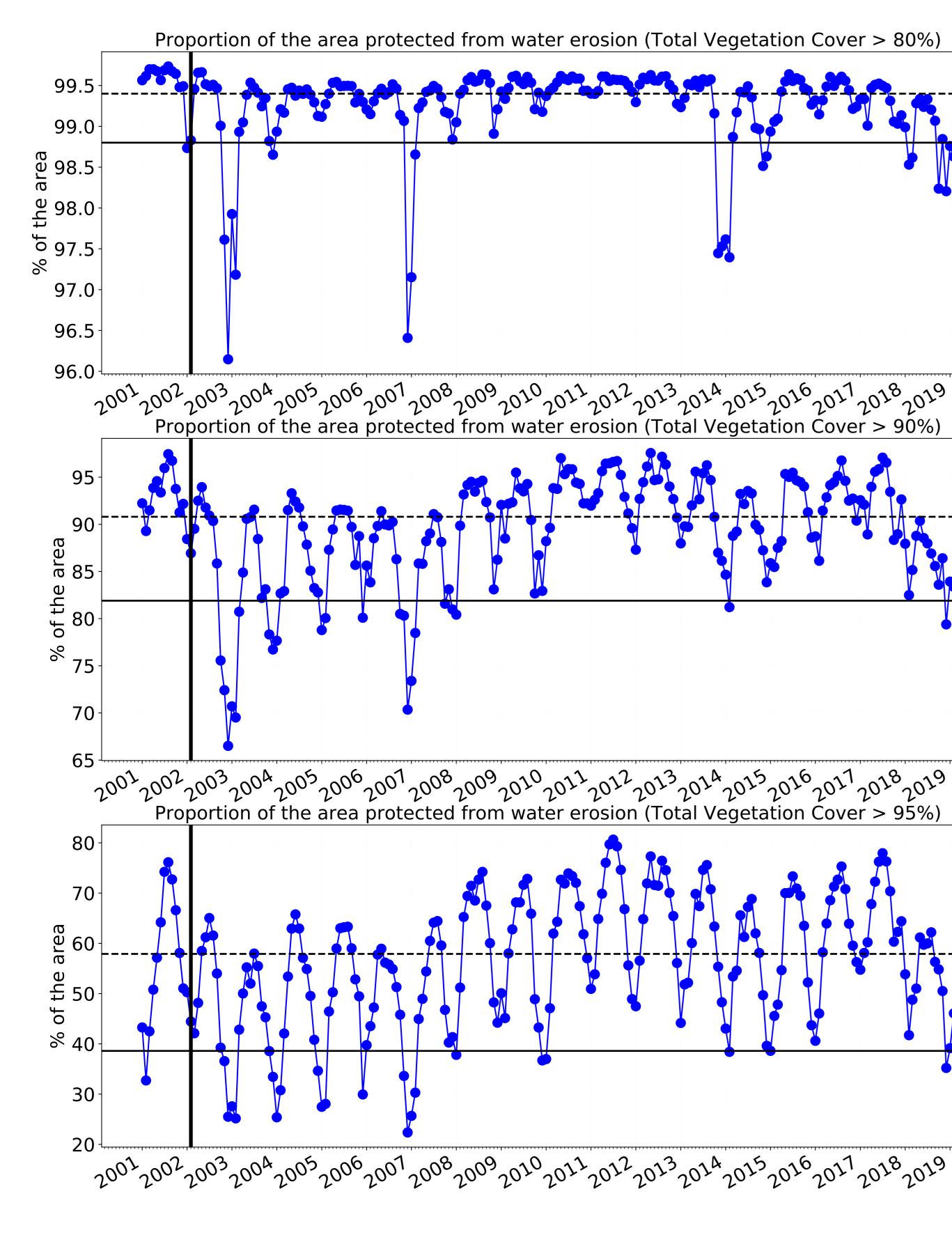


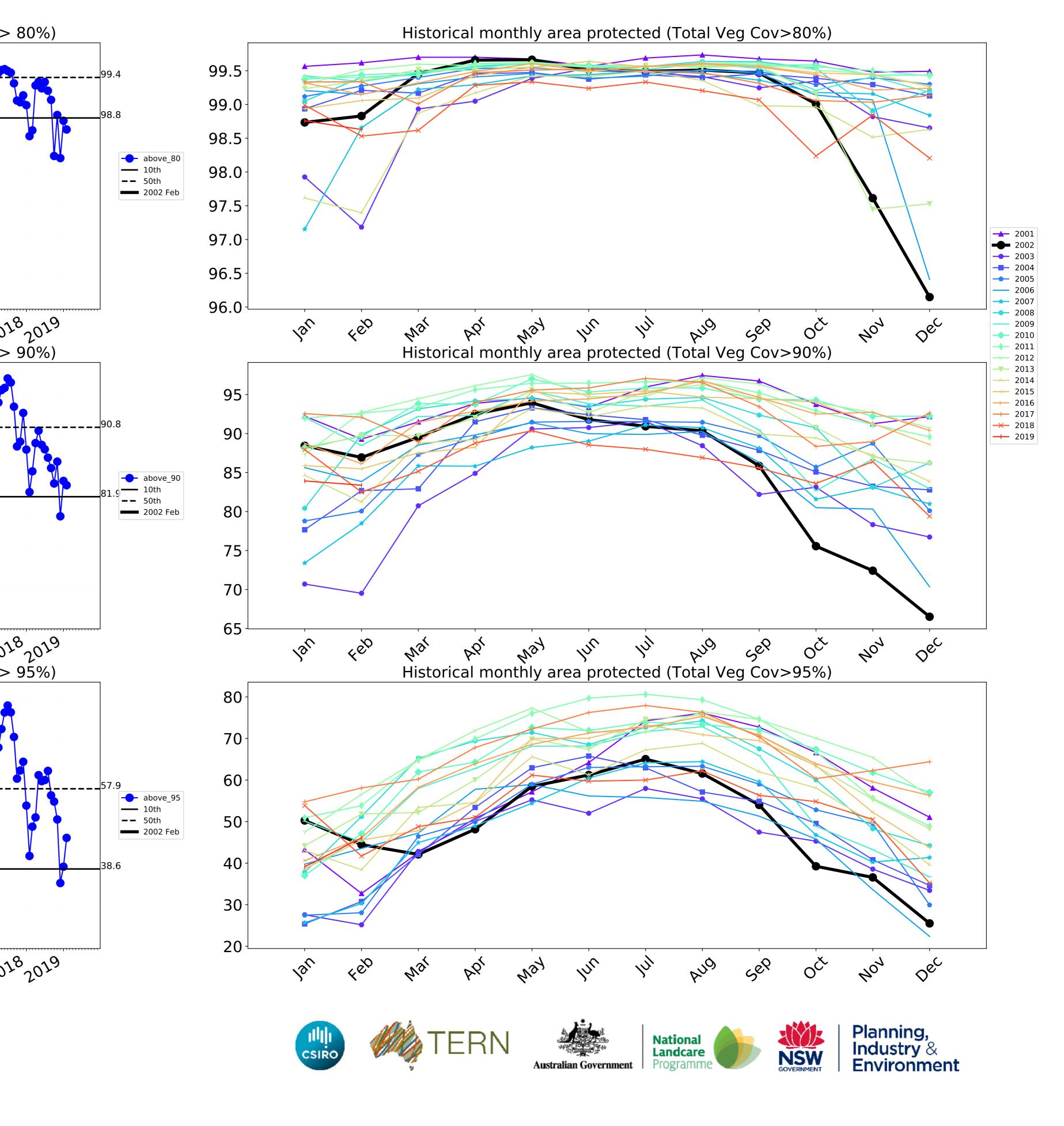
99.8-99.7 --- above\_70 **—** 10th **——** 50th 99.6 **——** 2002 Feb 99.5 99.4<sup>-</sup> 99.3-Jan feb In May 1's Mal P.Q month FERN CSIRC Australian Government

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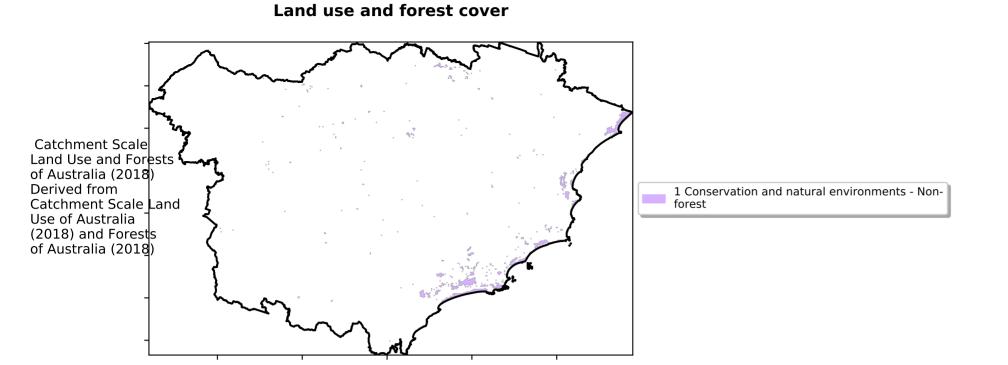
Water erosion historical monthly area protected (Total Veg Cov>70%)



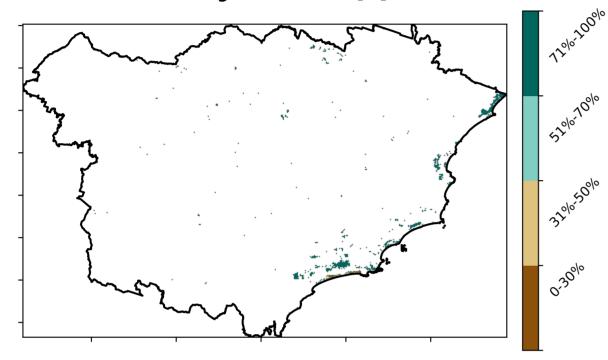




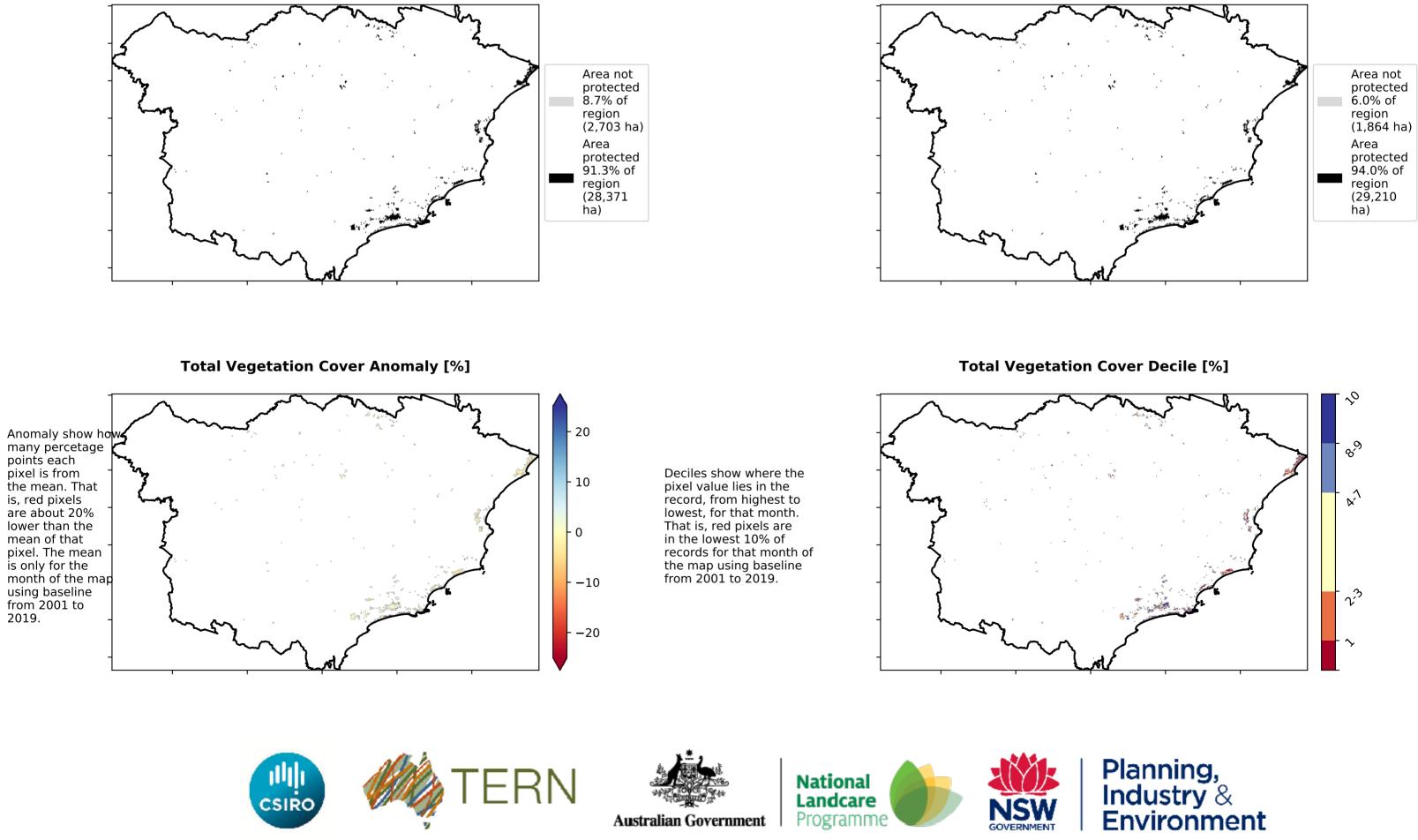
#### **Conservation and natural environments non forest**



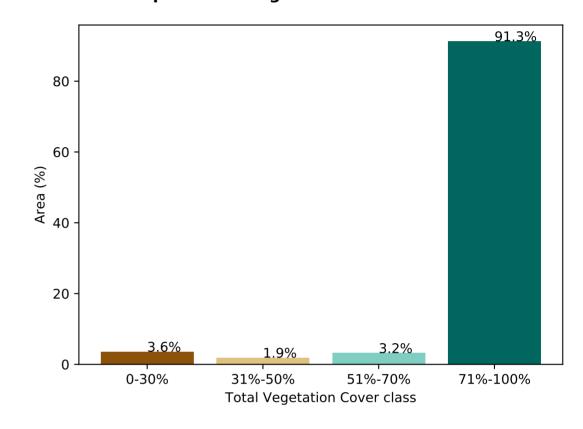
**Total Vegetation Cover [%]** 



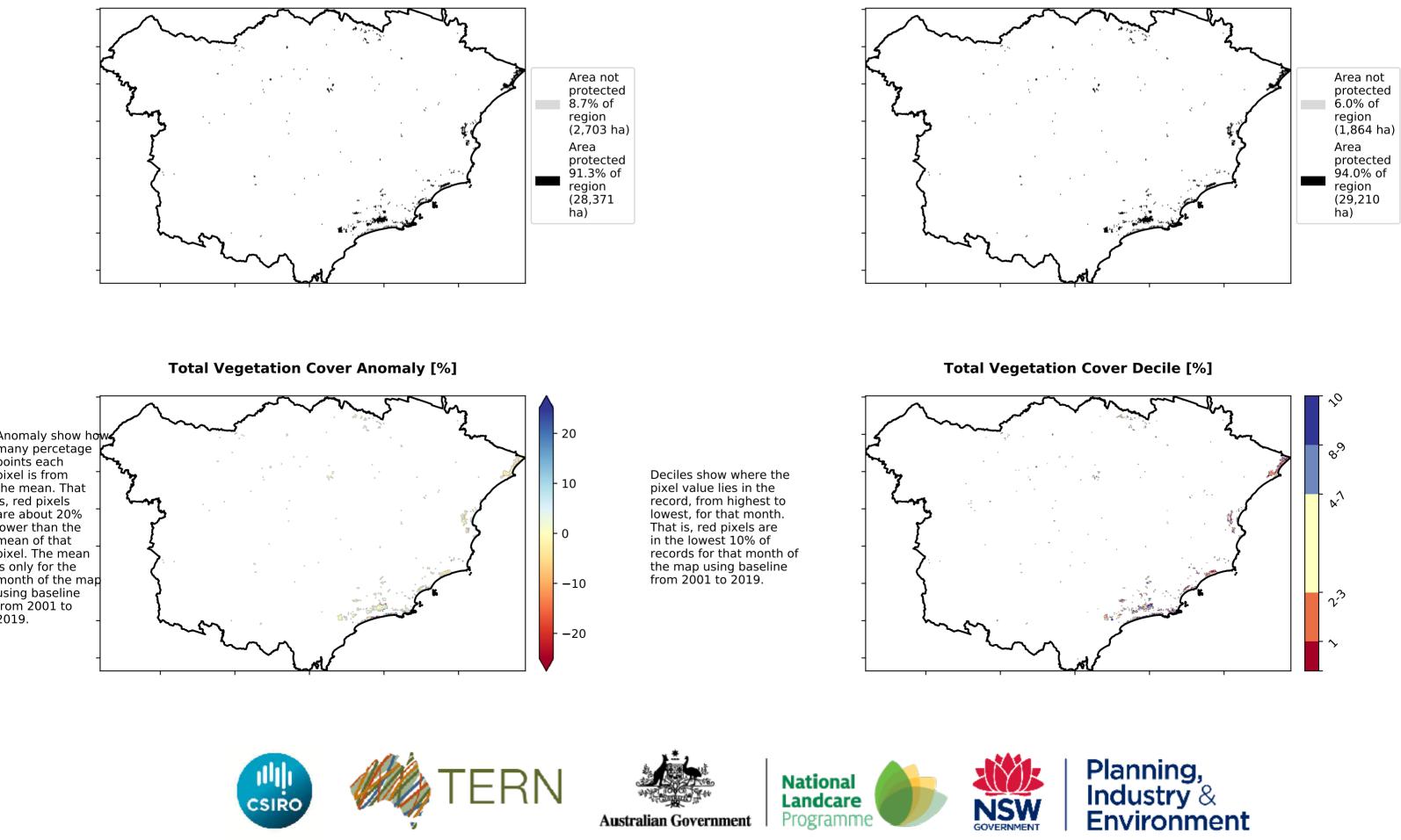
% Area protected from water erosion (>70%)

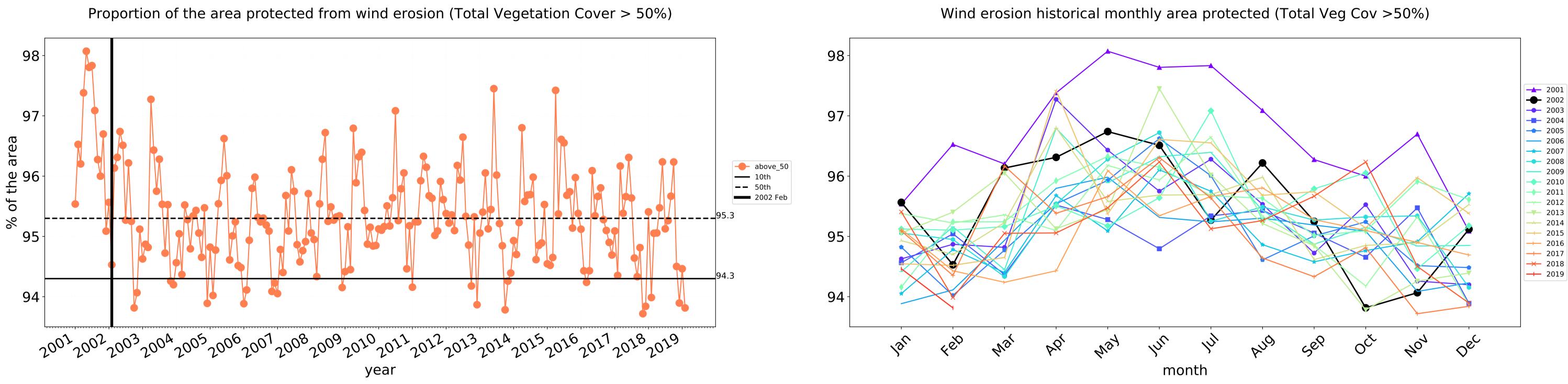


Proportion of vegetation cover class in area

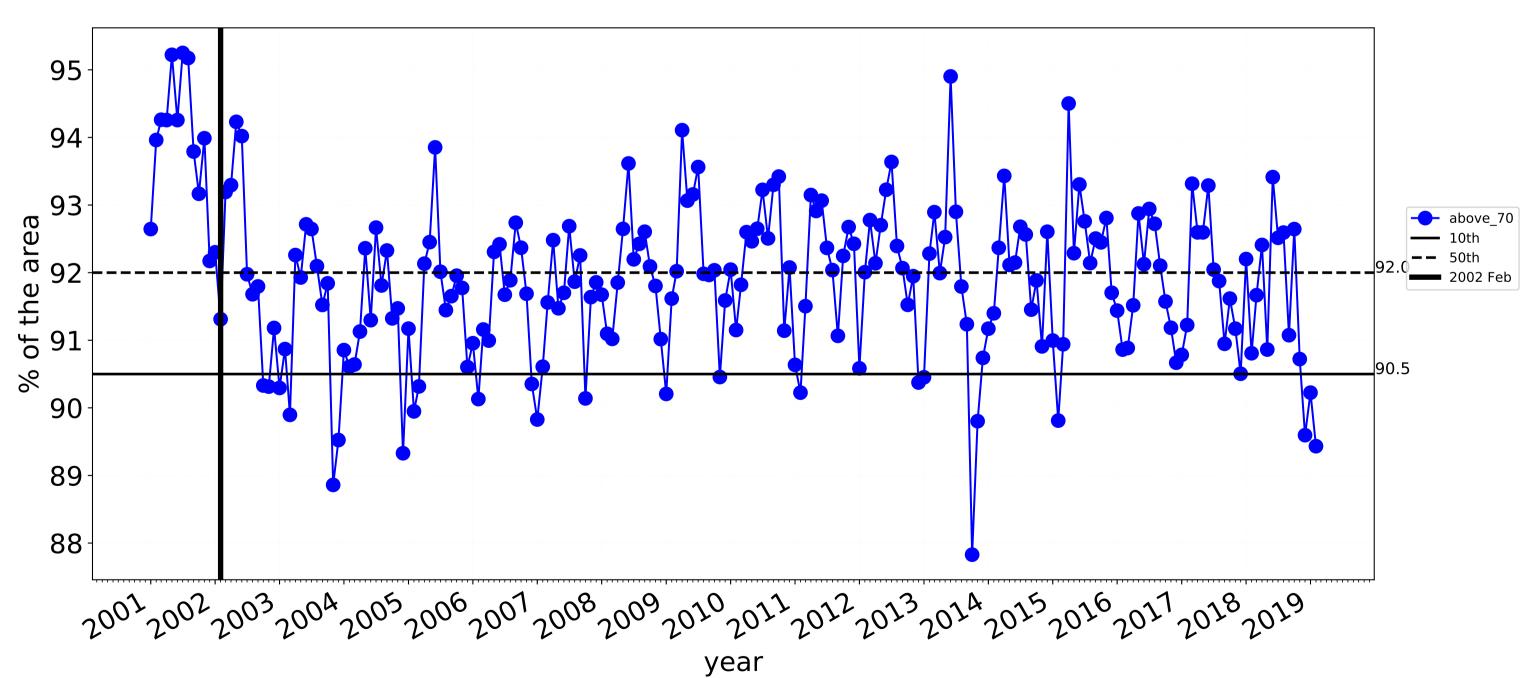


#### % Area protected from wind erosion (>50%)

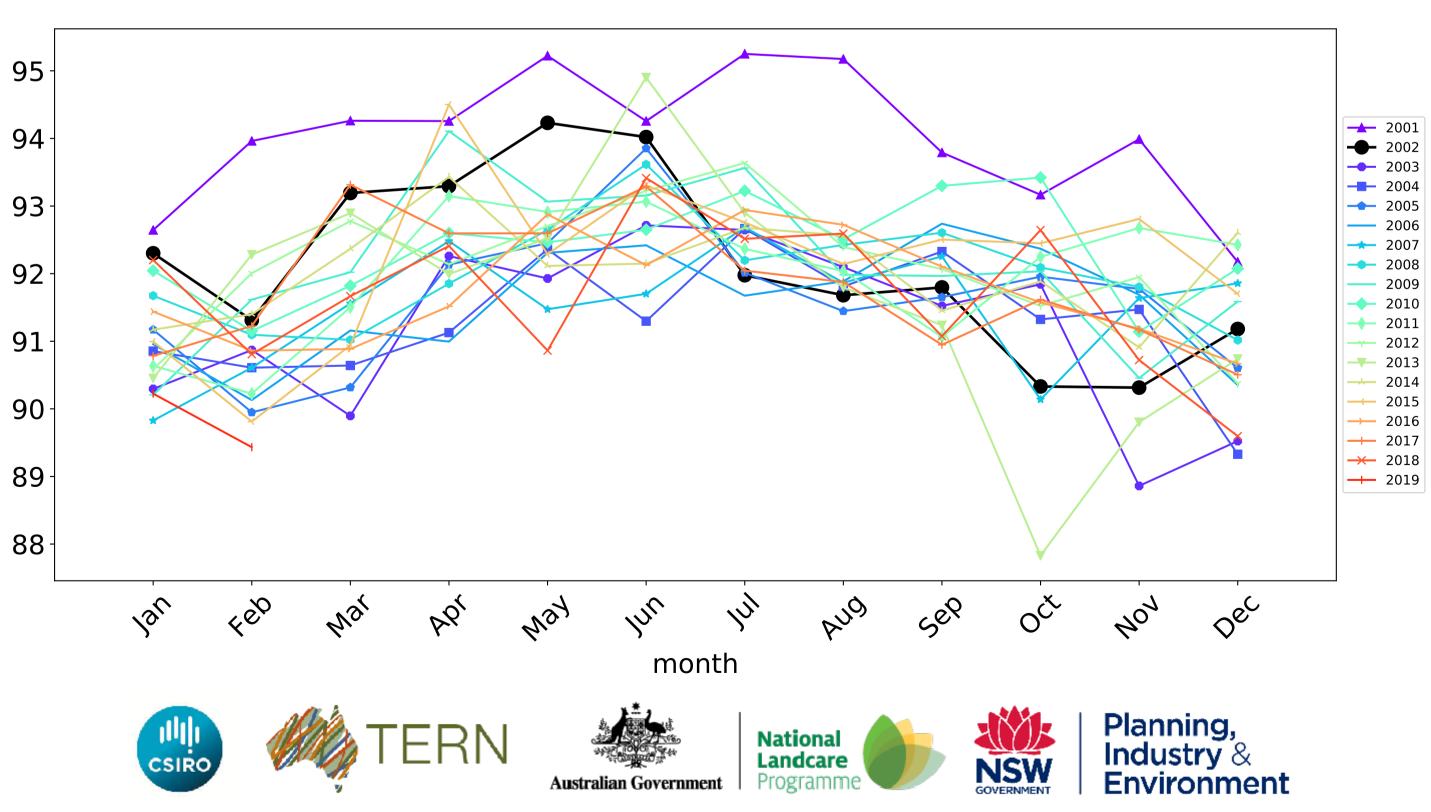




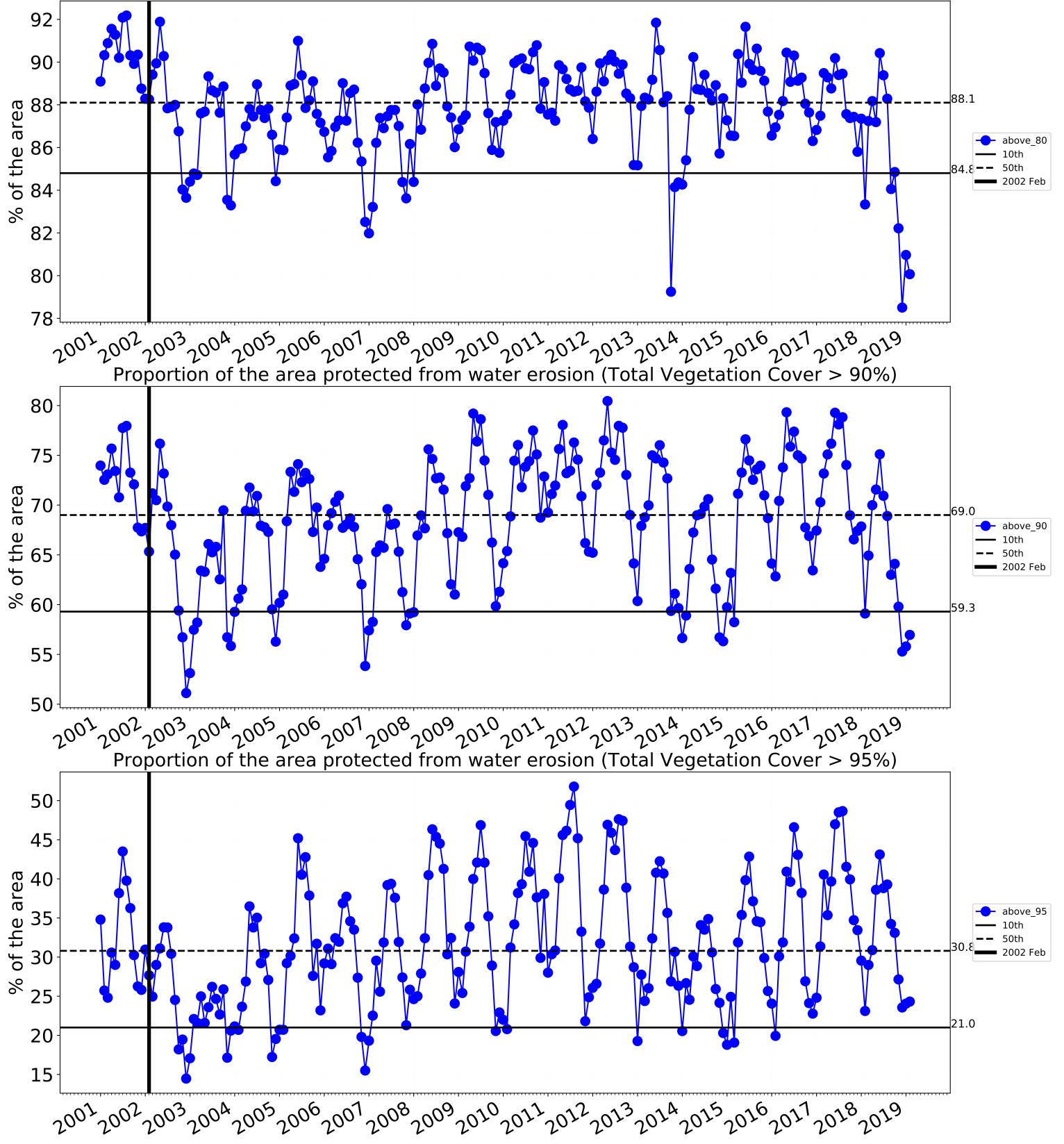
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



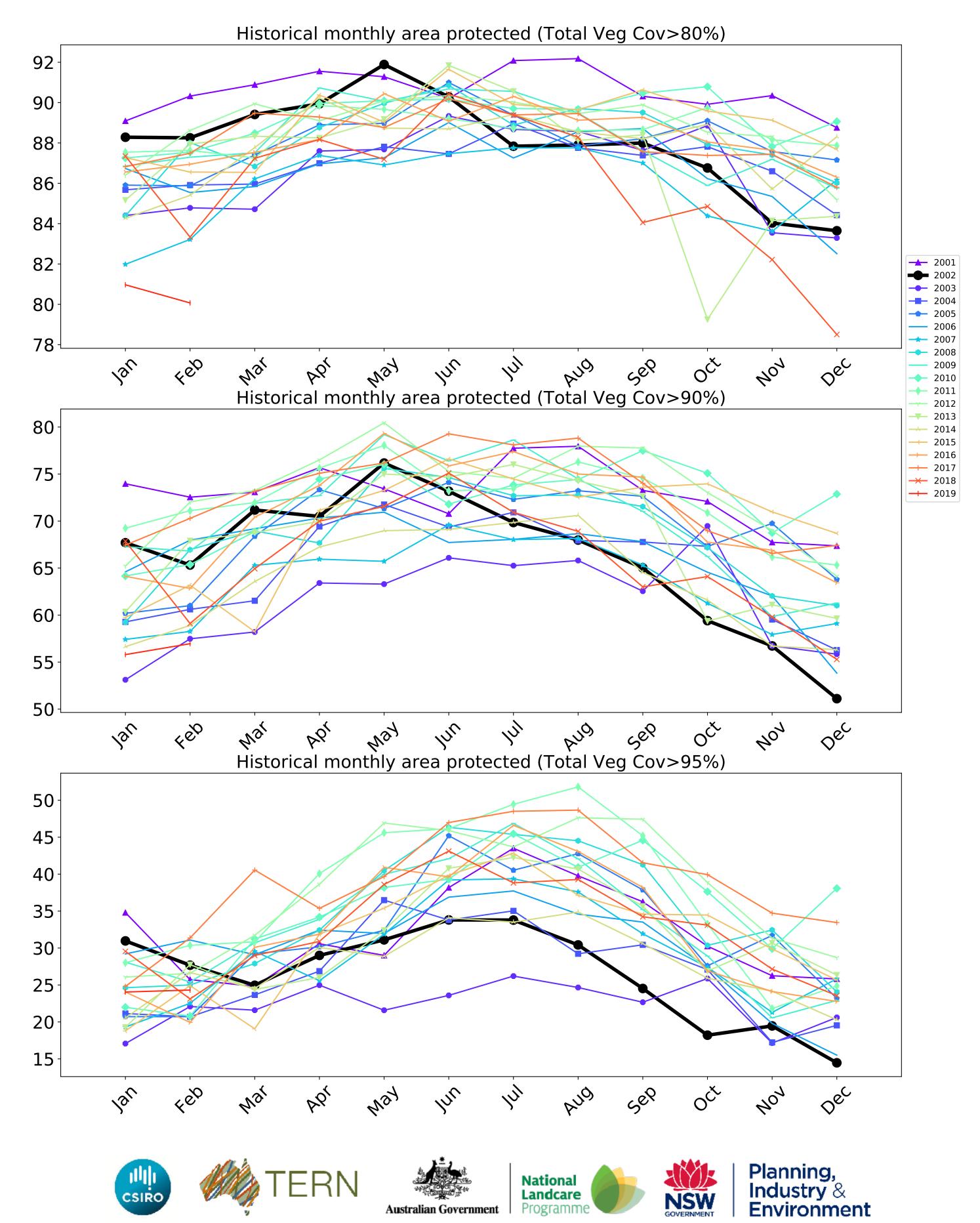
Water erosion historical monthly area protected (Total Veg Cov>70%)



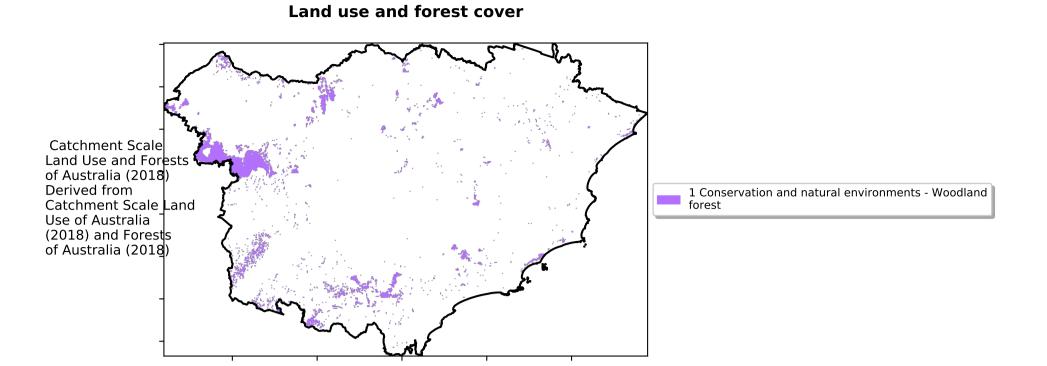
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



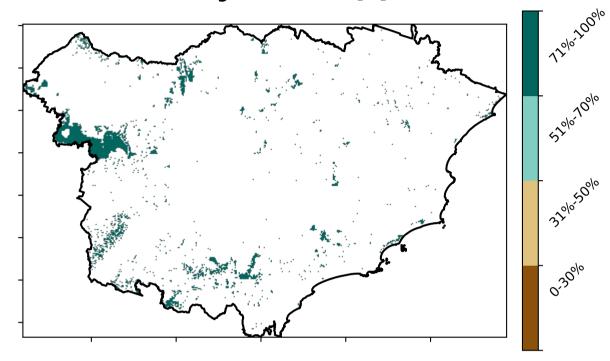




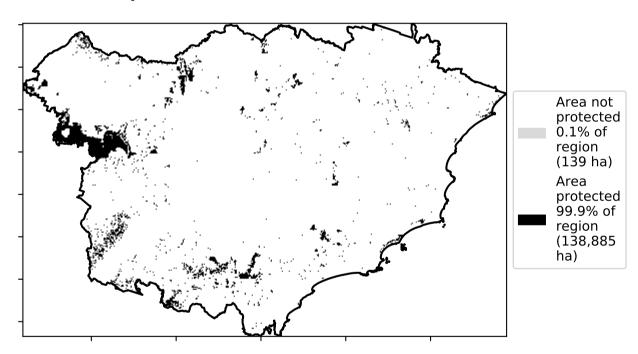
#### **Conservation and natural environments Woodland forest**



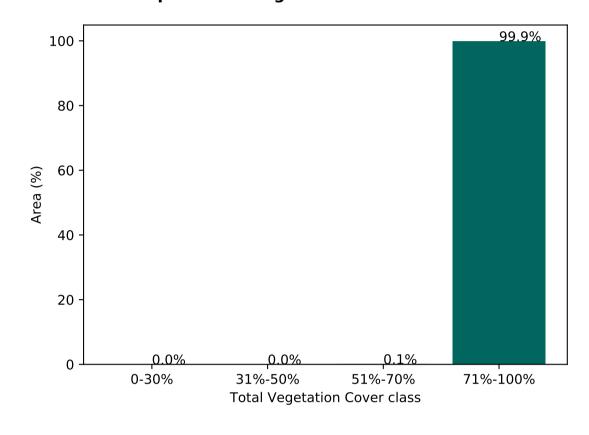
**Total Vegetation Cover [%]** 



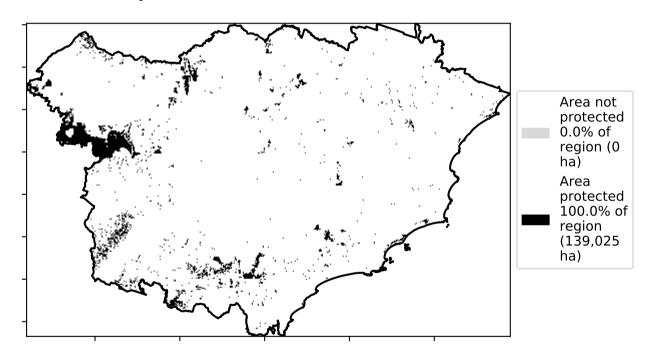
% Area protected from water erosion (>70%)



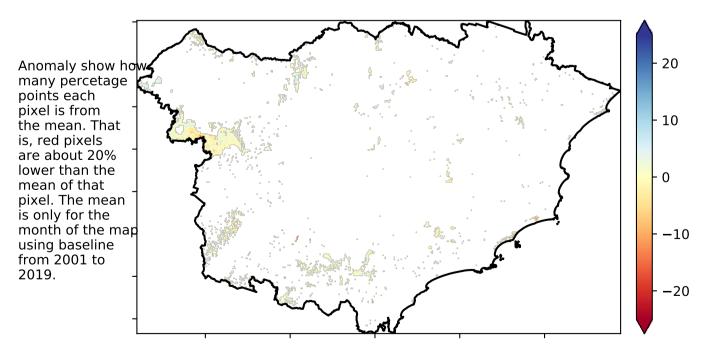
Proportion of vegetation cover class in area



#### % Area protected from wind erosion (>50%)

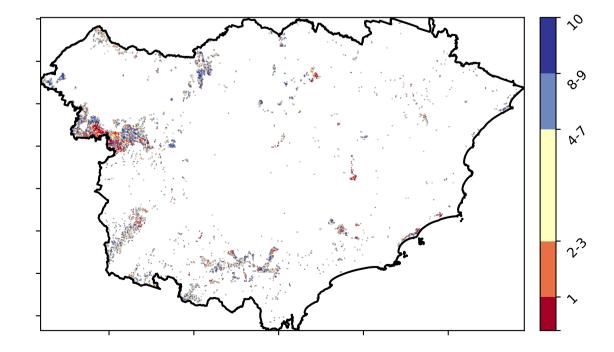


Total Vegetation Cover Anomaly [%]

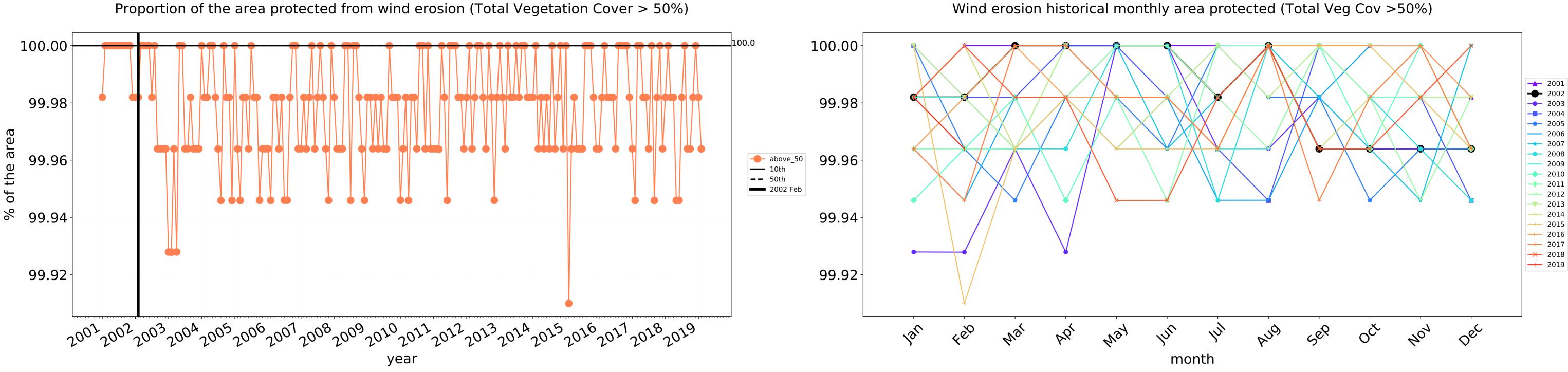


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Total Vegetation Cover Decile [%]

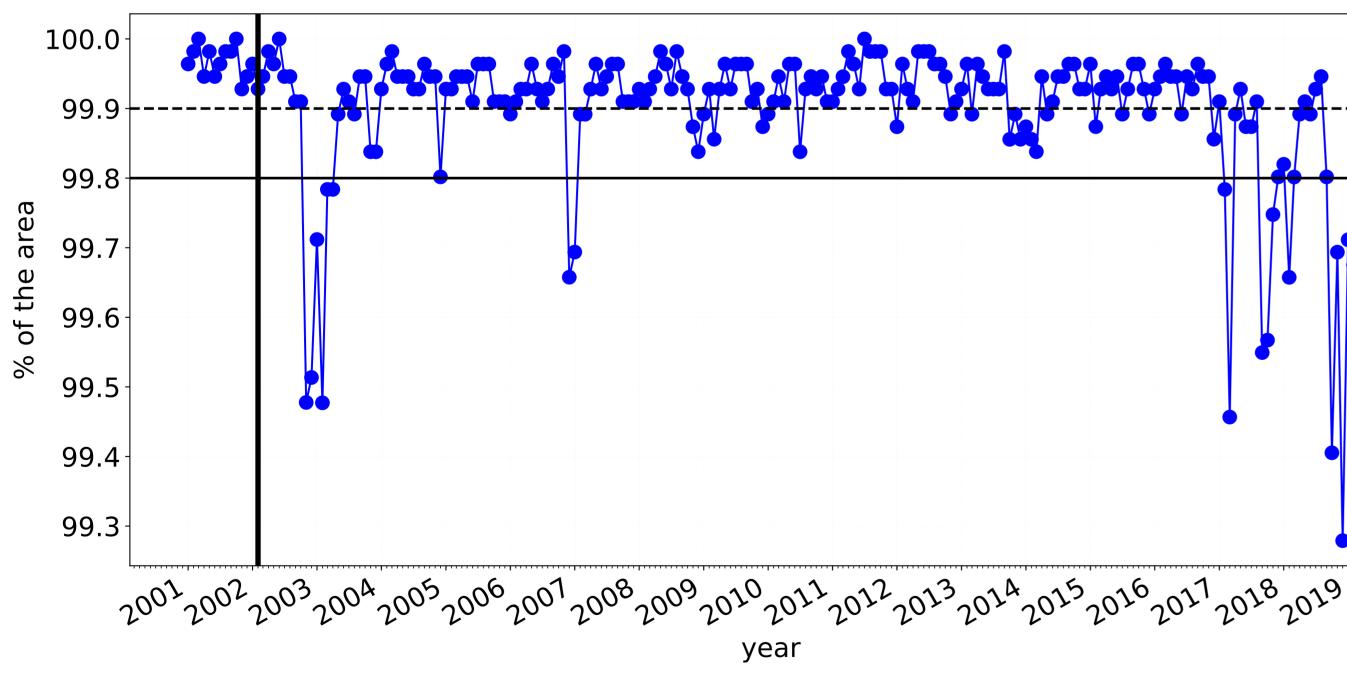






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

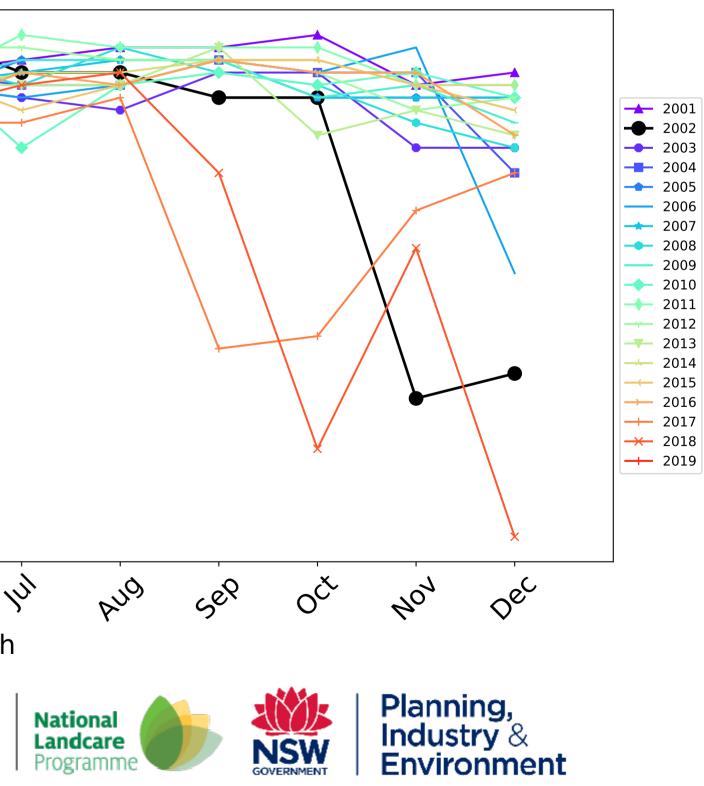


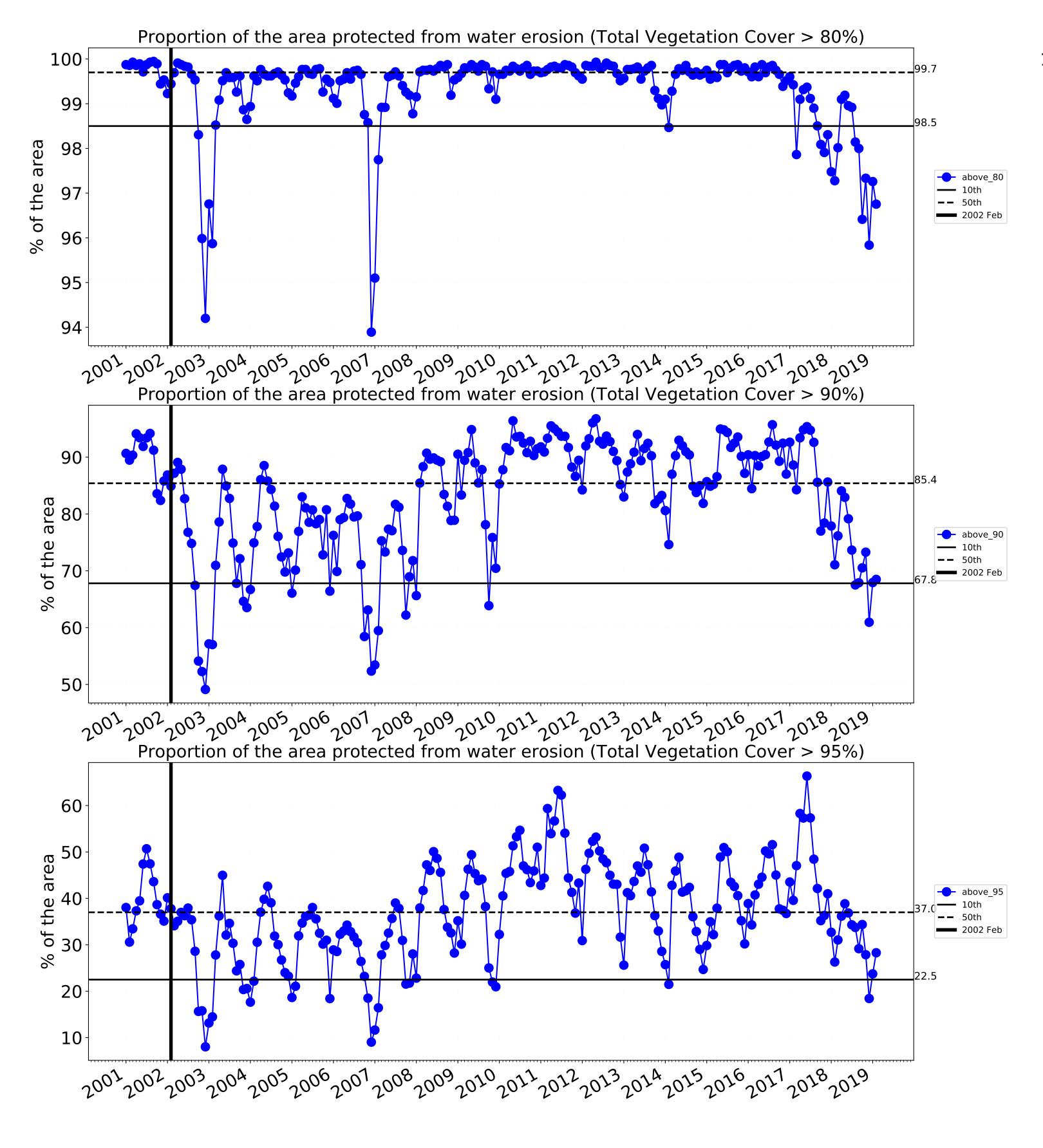
100.0 99.9 99.8 --- above\_70 **—** 10th 99.7 **--** 50th **——** 2002 Feb 99.6 99.5 99.4 99.3 lan feb In May PQ Mai month ΓERN CSIRO Australian Government

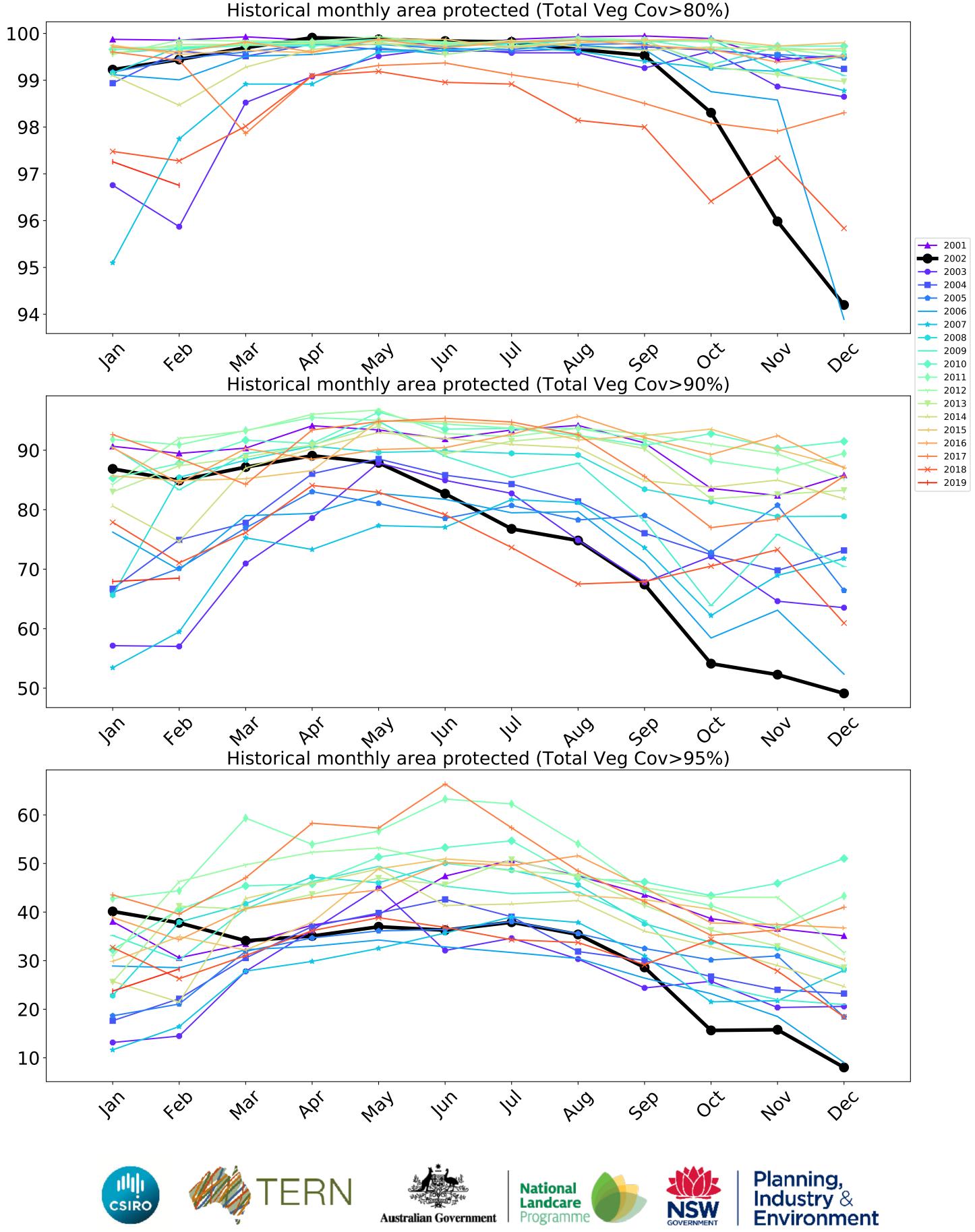
13

Program

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





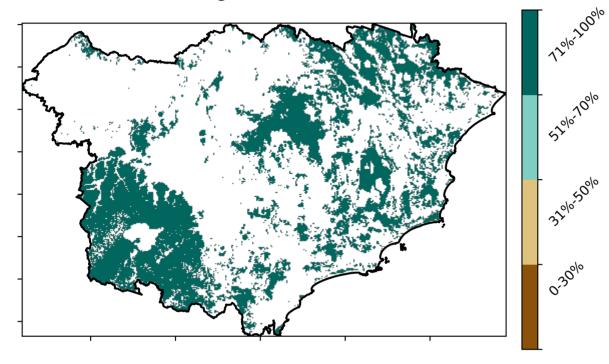




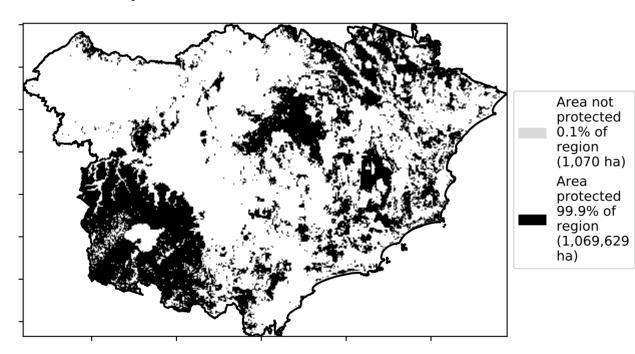
#### **Conservation and natural environments Forest (non woodland)**



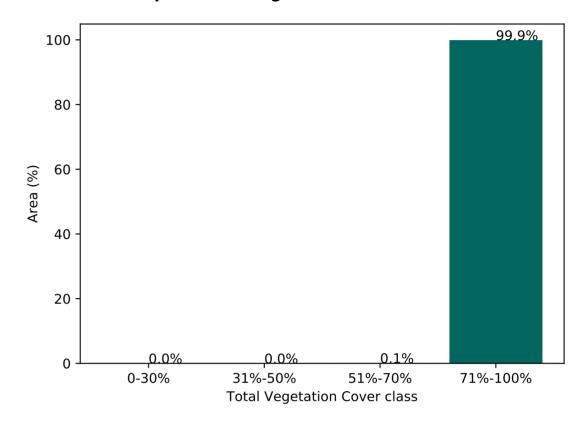
Total Vegetation Cover [%]



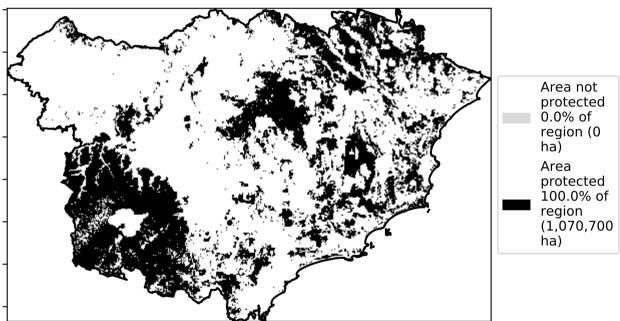
% Area protected from water erosion (>70%)



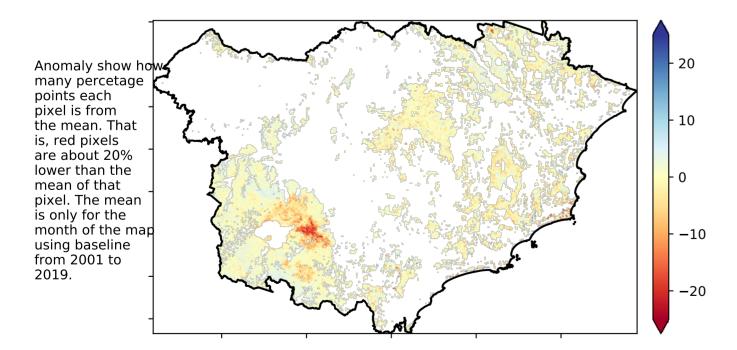
Proportion of vegetation cover class in area



#### % Area protected from wind erosion (>50%)

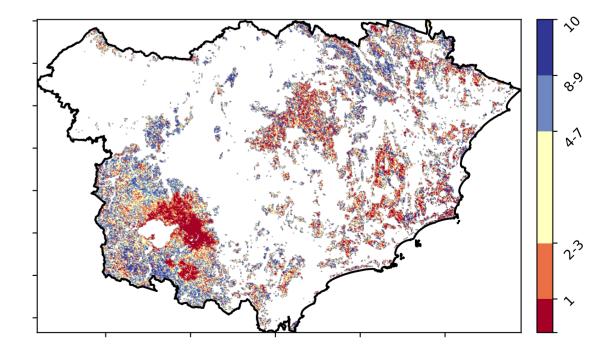


**Total Vegetation Cover Anomaly [%]** 

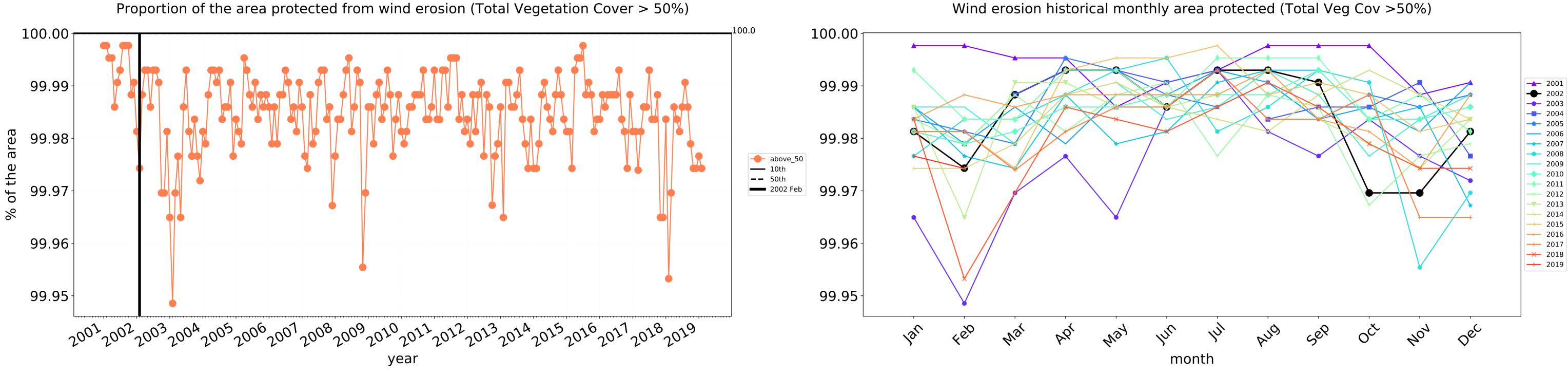


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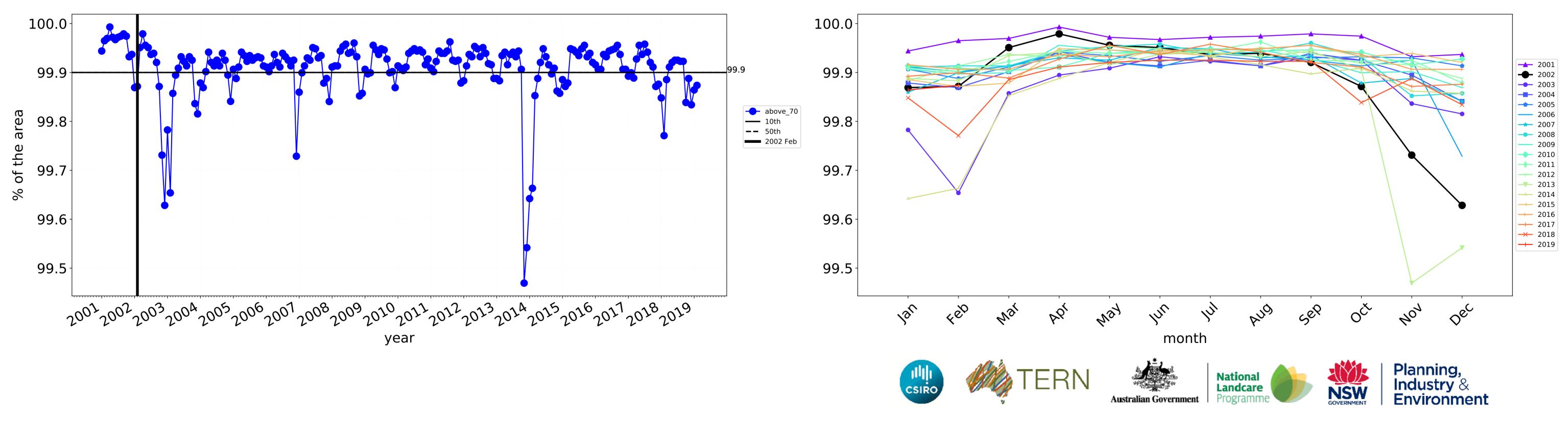
Total Vegetation Cover Decile [%]



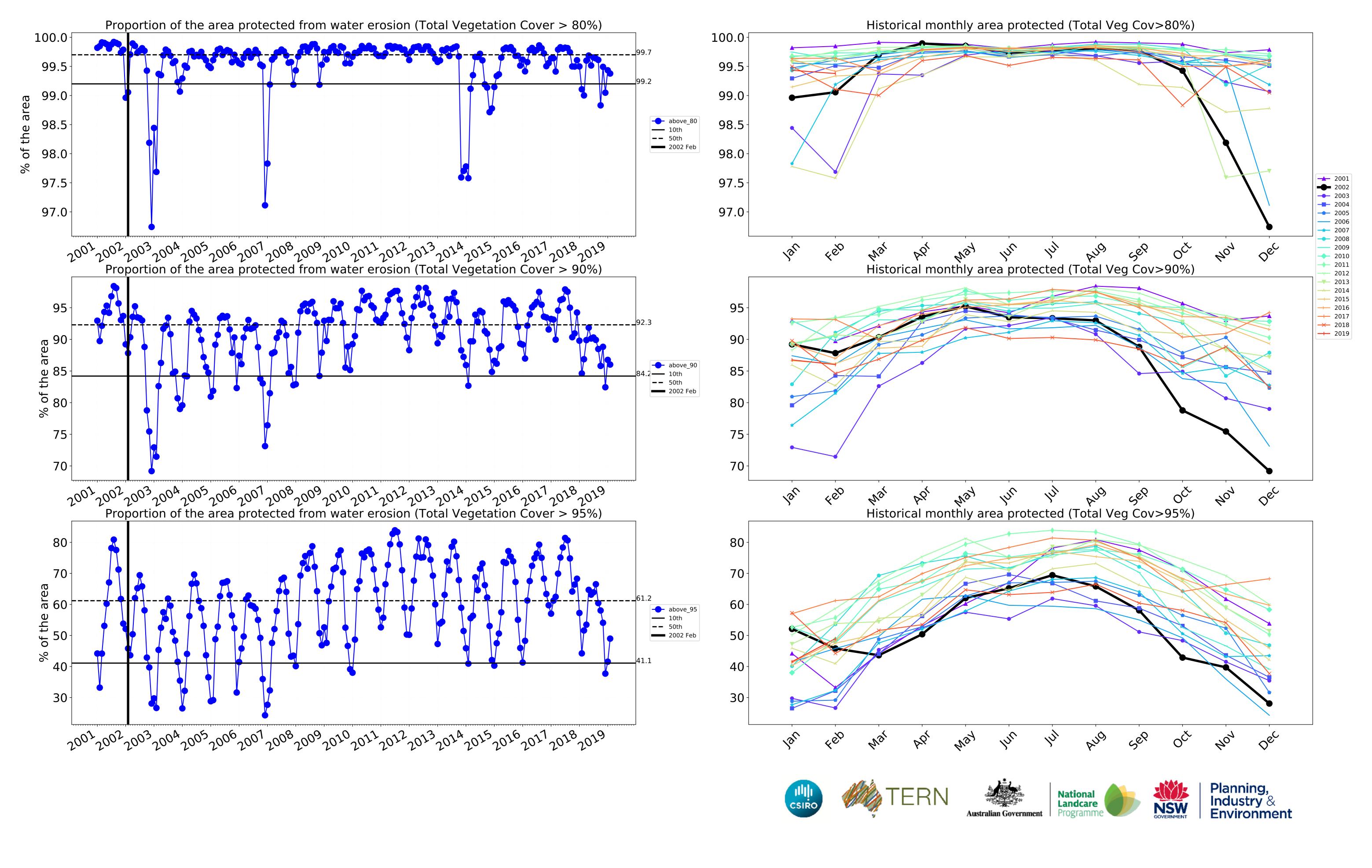




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



## Agriculture

Land use and forest cover 80 <u>76.</u>7% 70 · 60 Catchment Scale Land Use and Forests of Australia (2018) 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 50 Area (%) - 05 3 Agriculture - Grazing - Non-woodland forest Derived from 4 Agriculture - Grazing - Irrigated Catchment Scale Land 5 Agriculture - Cropping - Non-irrigated Use of Australia (2018) and Forests of Australia (2018) 6 Agriculture - Cropping - Irrigated 7 Agriculture - Horticulture - Non-irrigated 30 8 Agriculture - Horticulture - Irrigated 20 <u>10.</u>7% 10 <u>7.6</u>% 0 1 2 3 Land use class Proportion of vegetation cover class in area **Total Vegetation Cover [%]** 1200,100, 100 80 52%70% 60 Area (%) 32010 40 0.30% 20 0.0% 0.0% 0 0-30% 31%-50% 51%-70% Total Vegetation Cover class % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%)

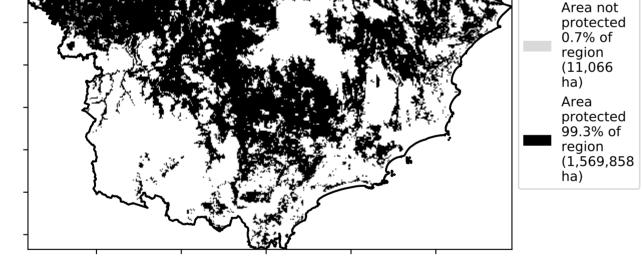
#### Proportion of each land class in area

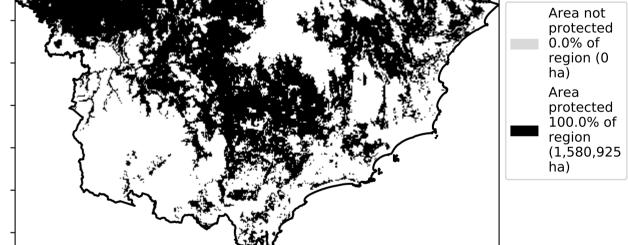
0.2%

8

99.3%

71%-100%





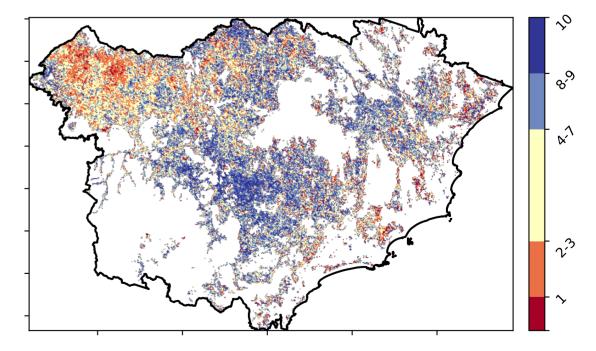
0.7%

**Total Vegetation Cover Anomaly [%]** 

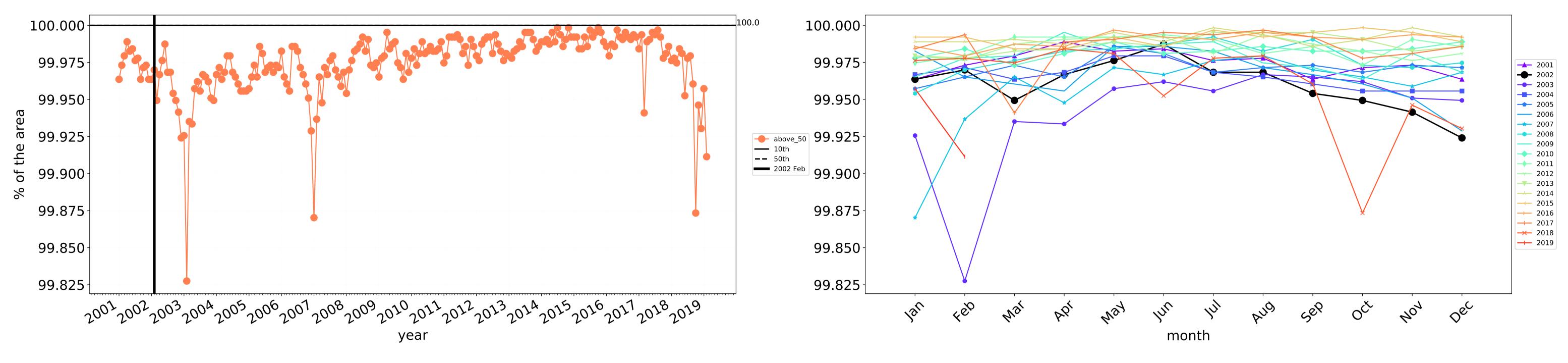
Anomaly show how many percetage points each pixel is from the mean. That · 20 - 10 is, red pixels are about 20% lower than the 0 mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019. -10-20

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

**Total Vegetation Cover Decile [%]** 

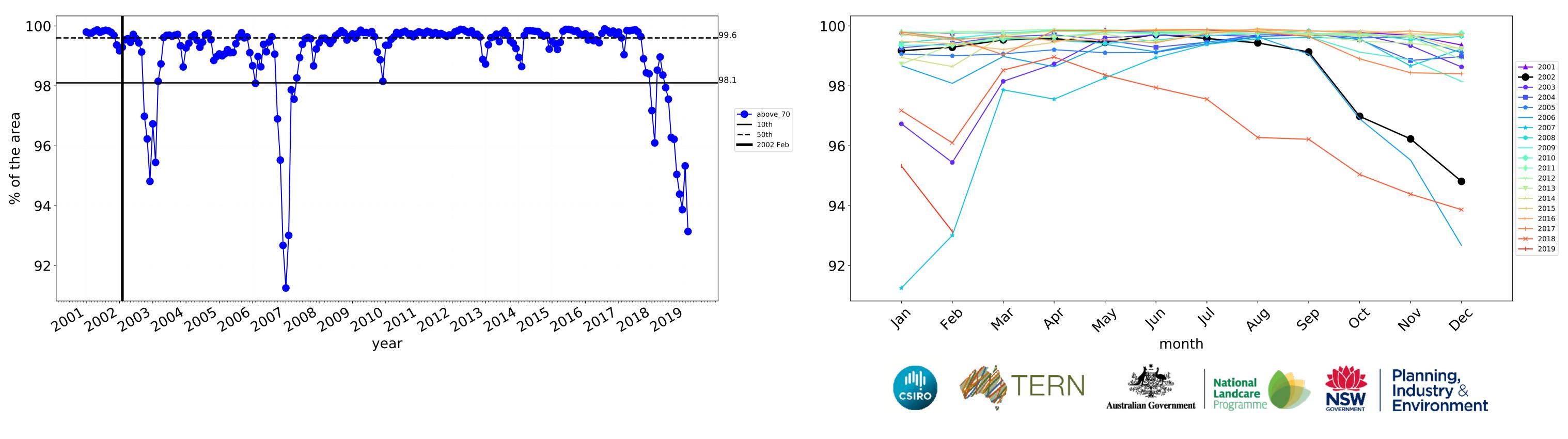






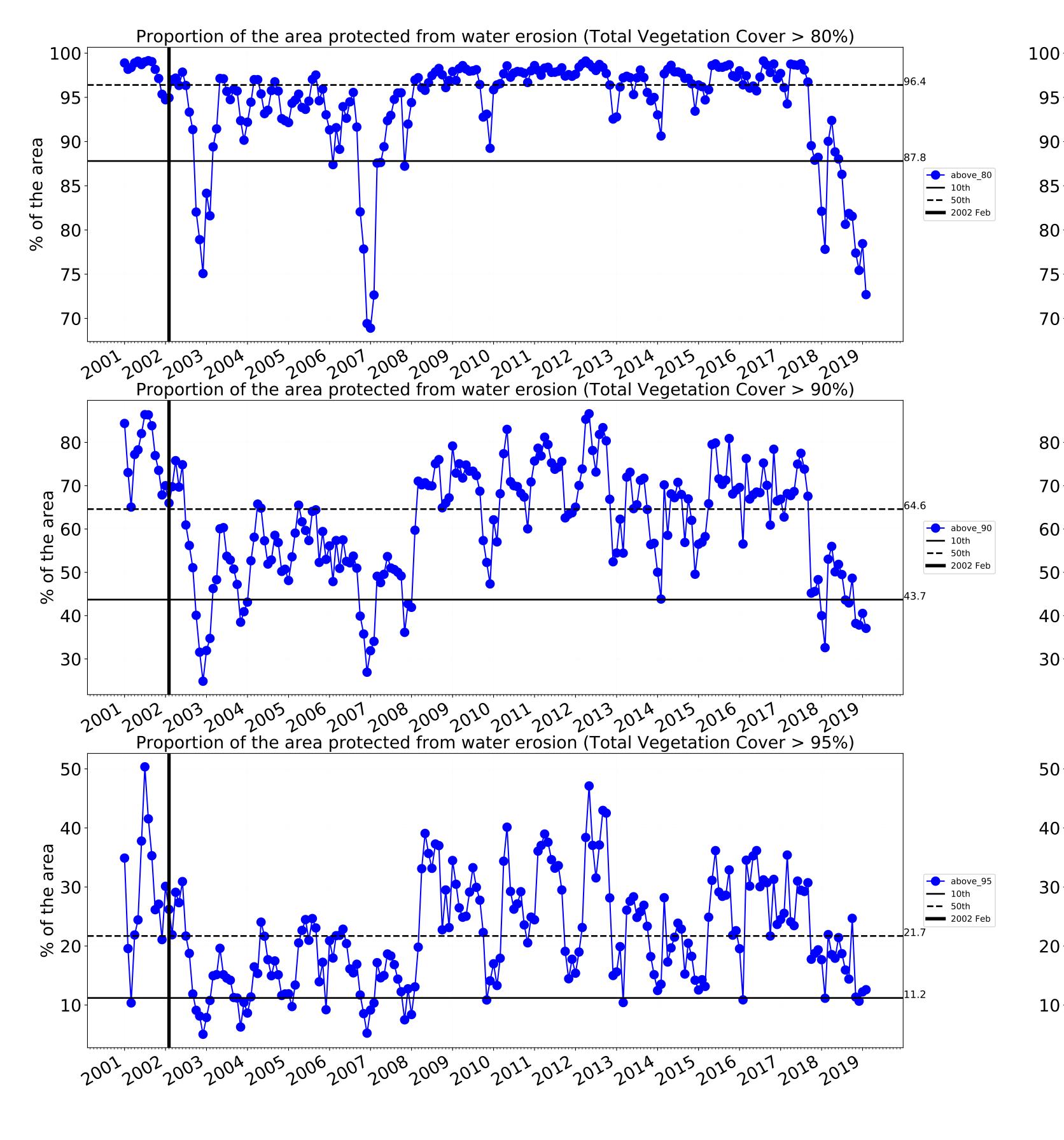
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

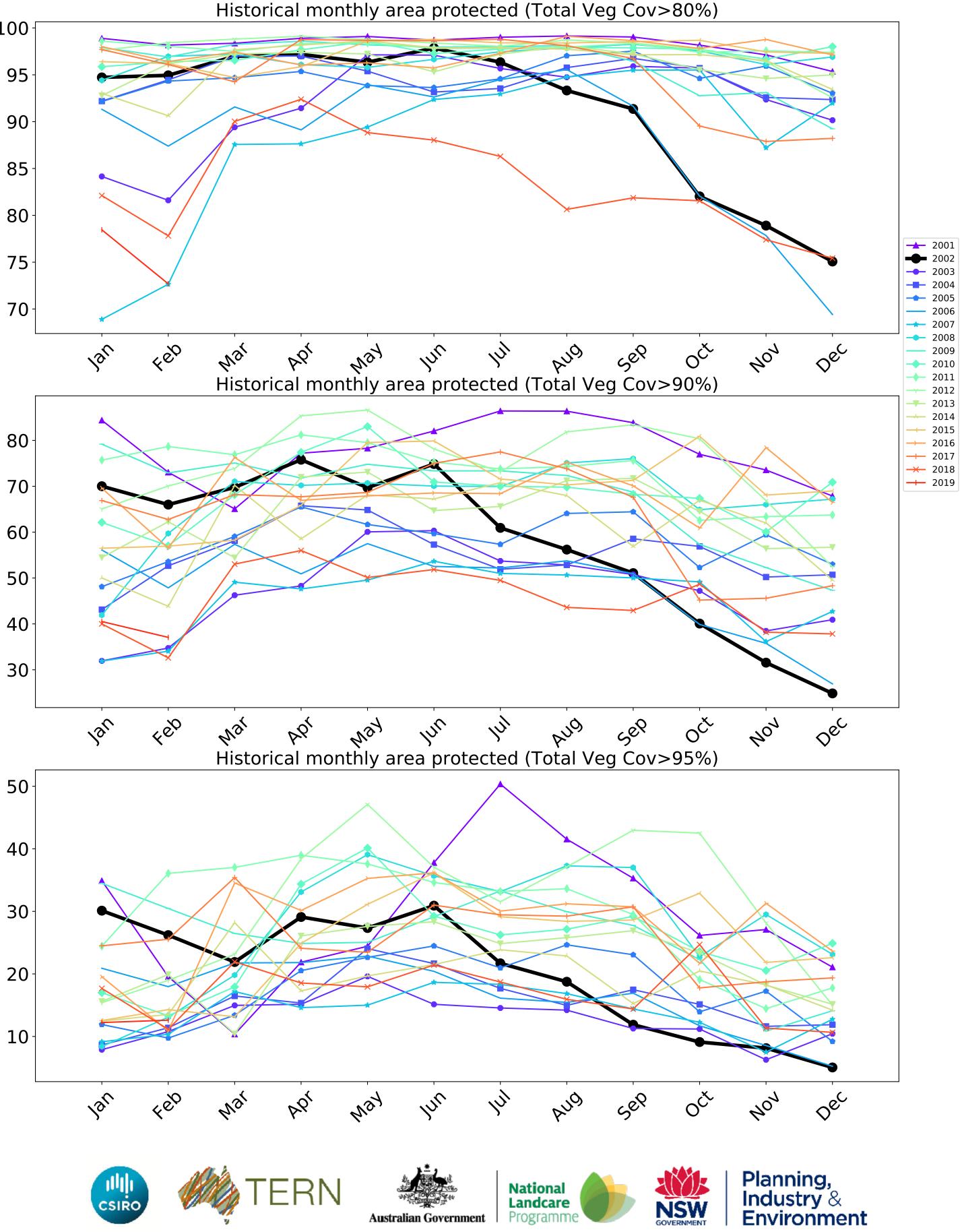
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

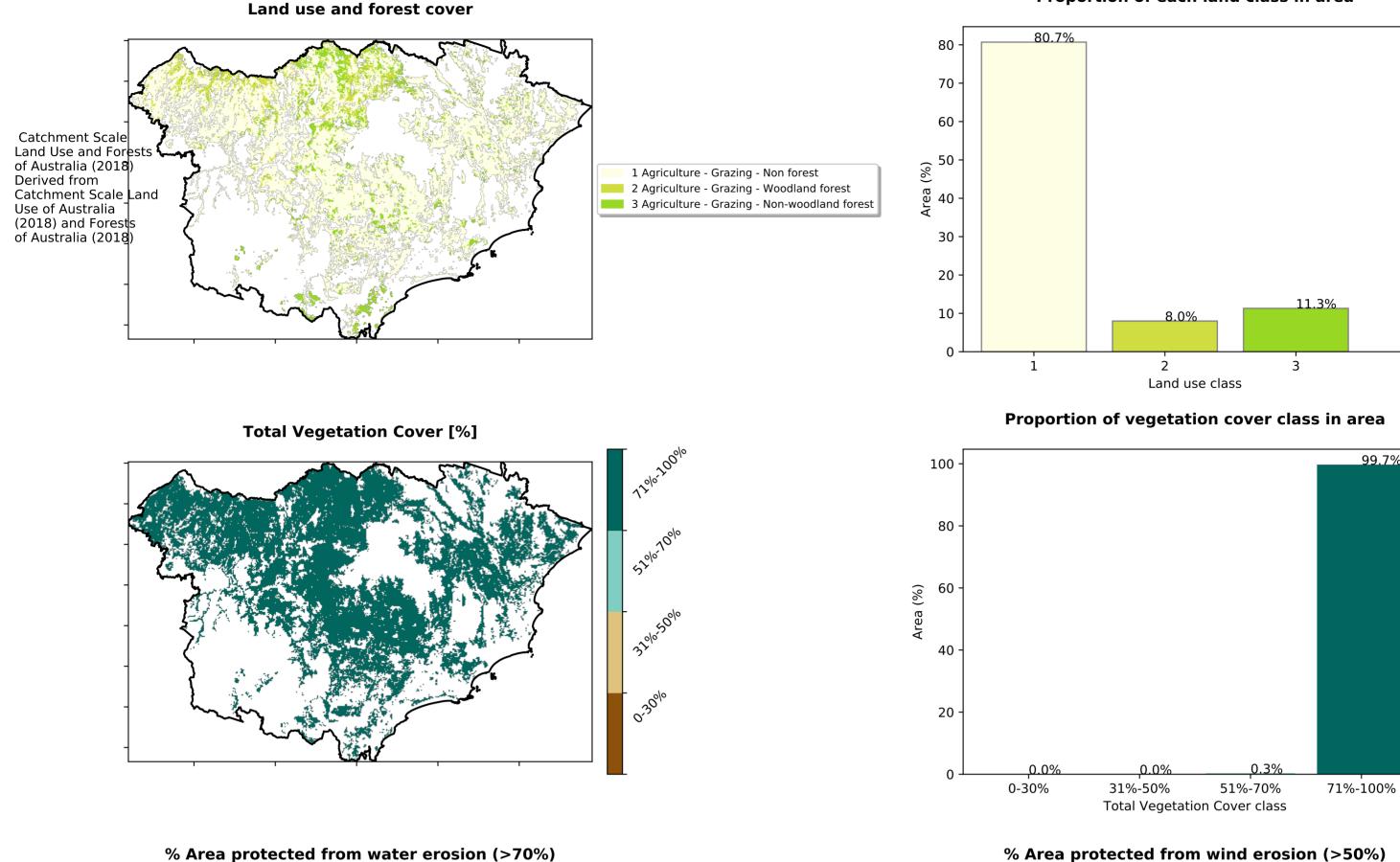
Water erosion historical monthly area protected (Total Veg Cov>70%)

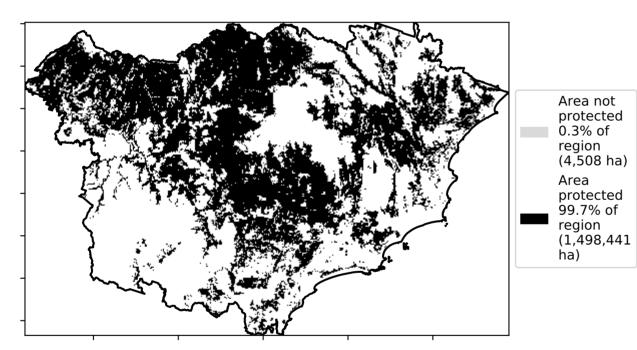






## Grazing





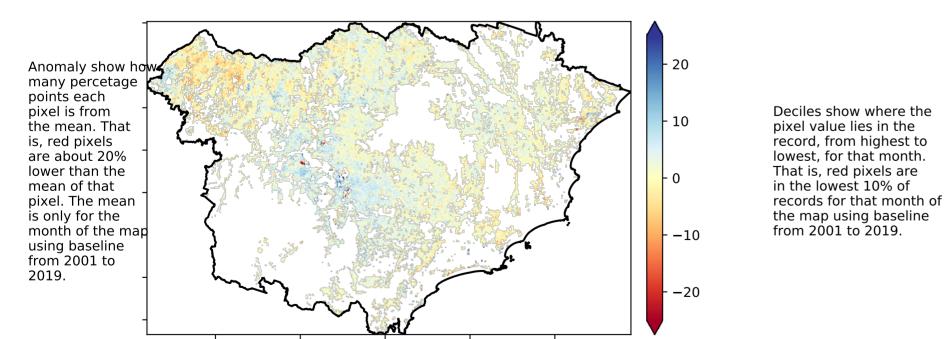
Proportion of each land class in area

99.7%



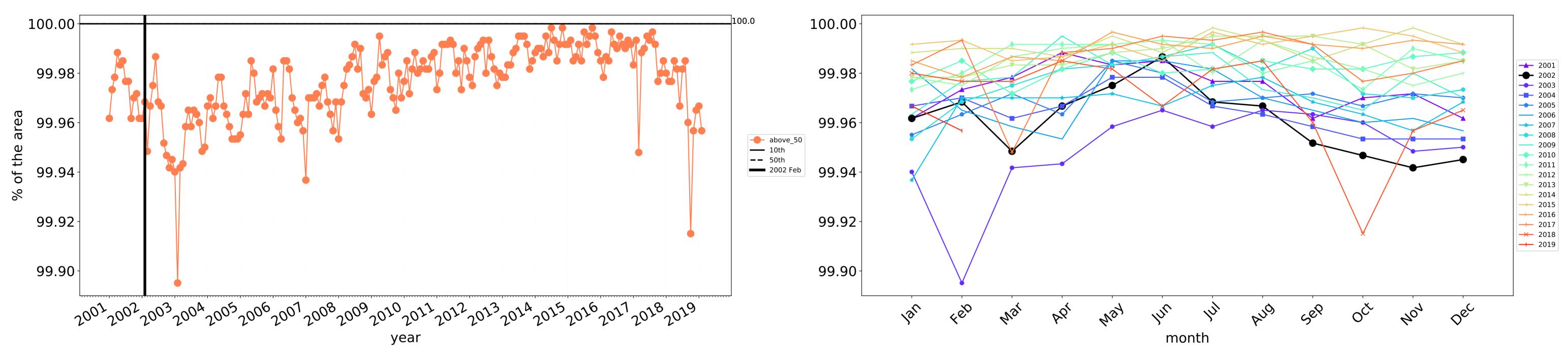
**Total Vegetation Cover Anomaly [%]** 

Total Vegetation Cover Decile [%]



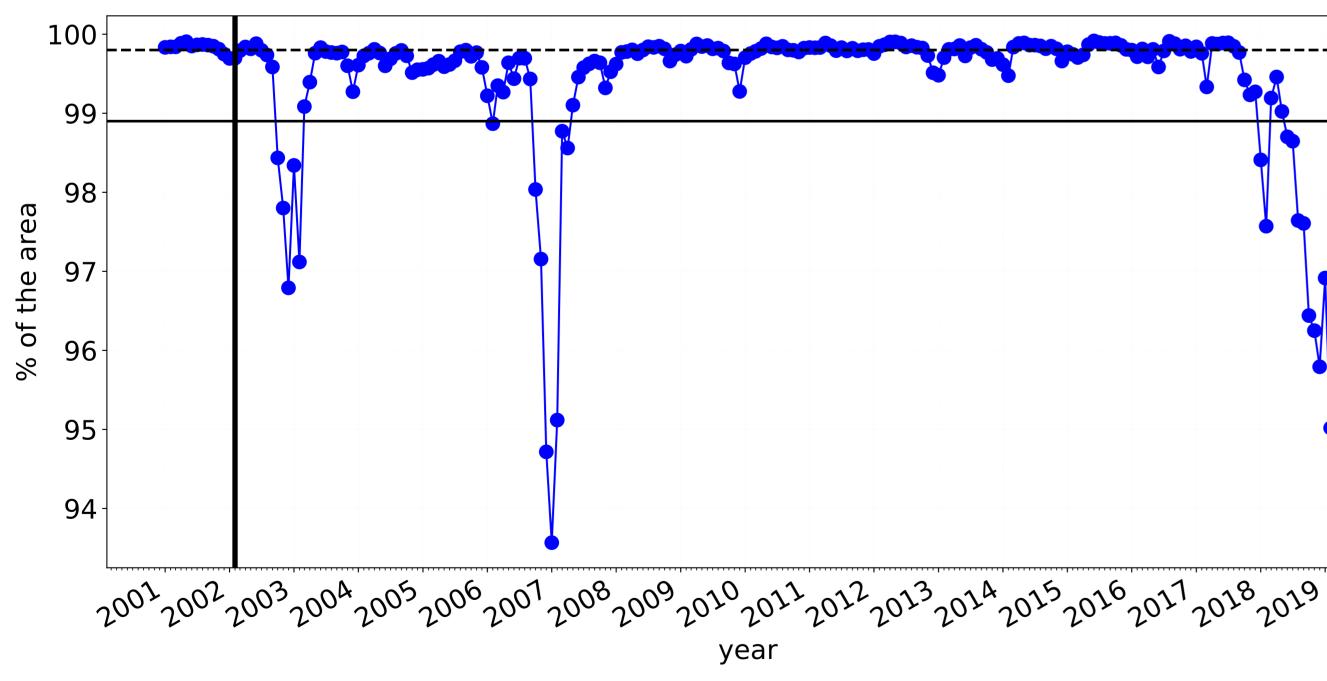
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Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

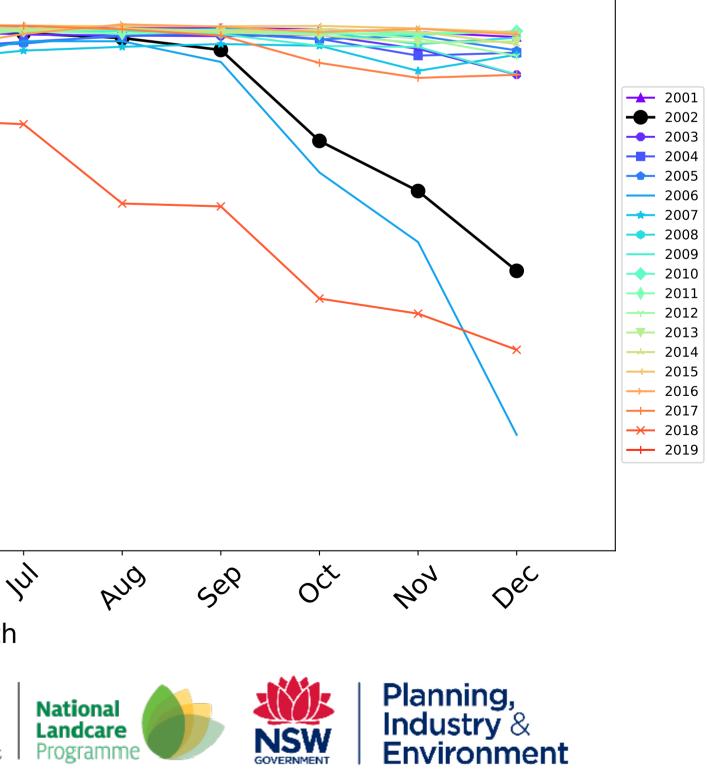


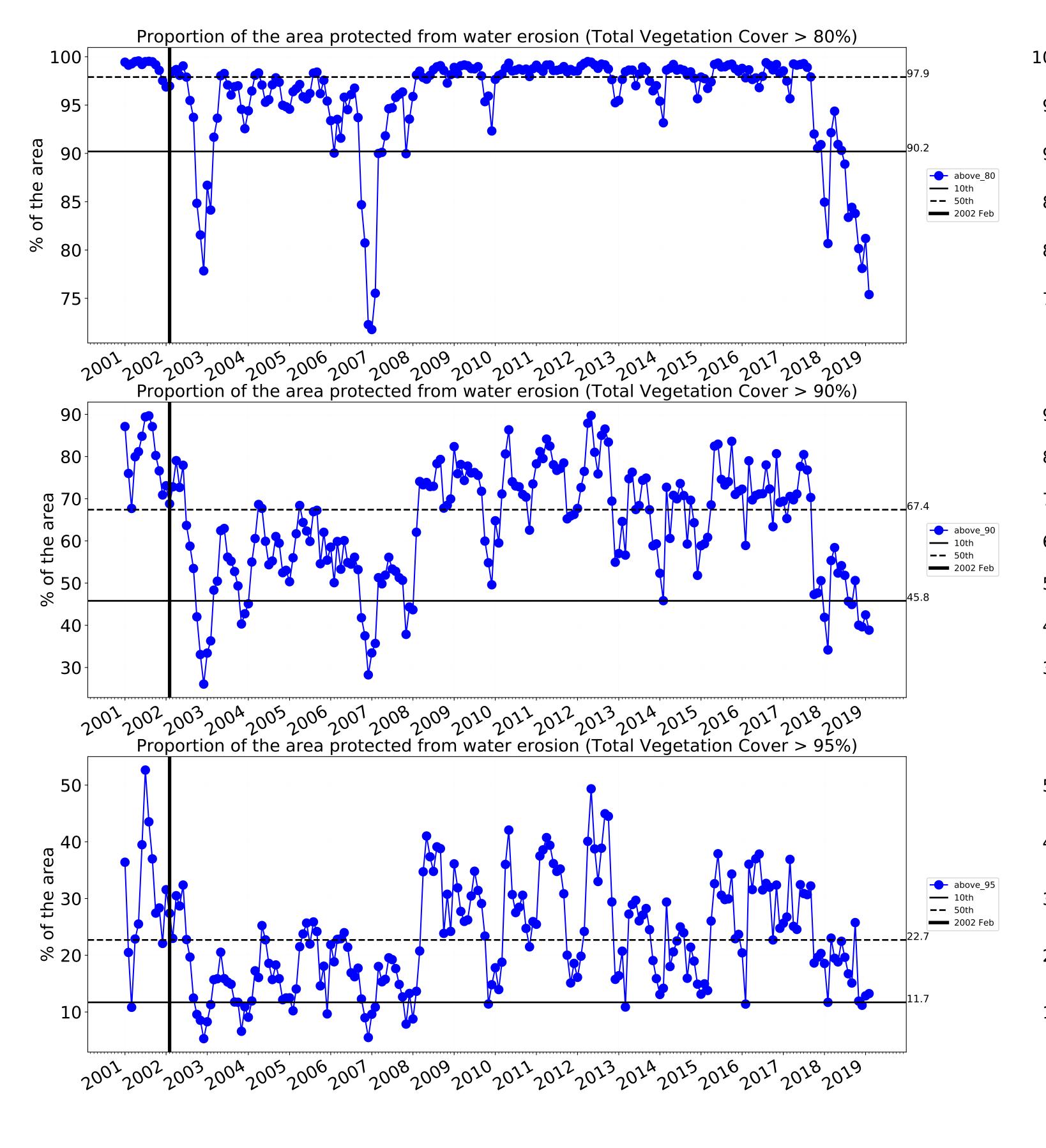
Wind erosion historical monthly area protected (Total Veg Cov >50%)

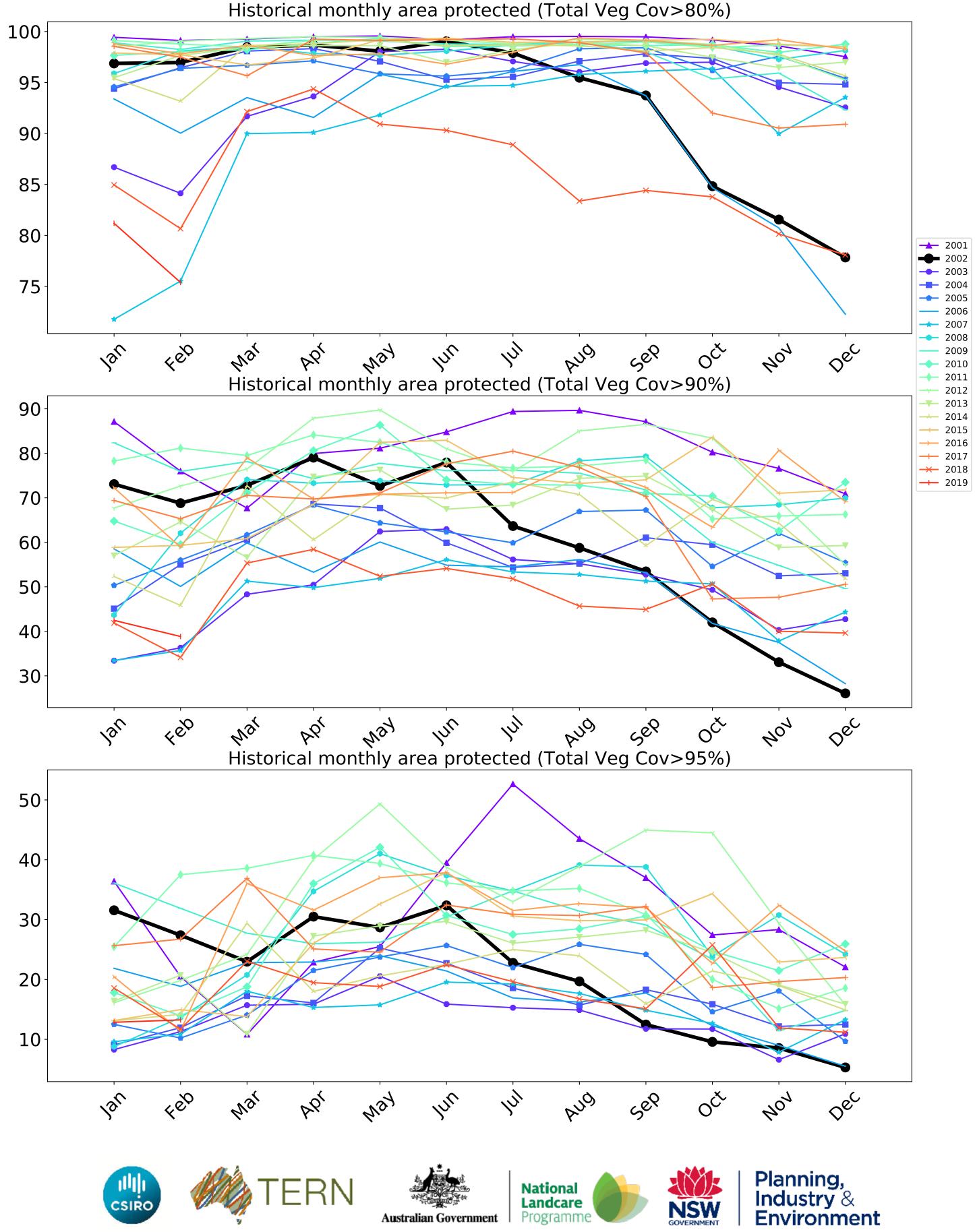


100 \_\_\_\_\_99.8 99 98 ---- above\_70 **—** 10th **--** 50th **—** 2002 Feb 97 96 95 94 lar feb way hill POL Mai month **FERN** (SOC) CSIRO Australian Government

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



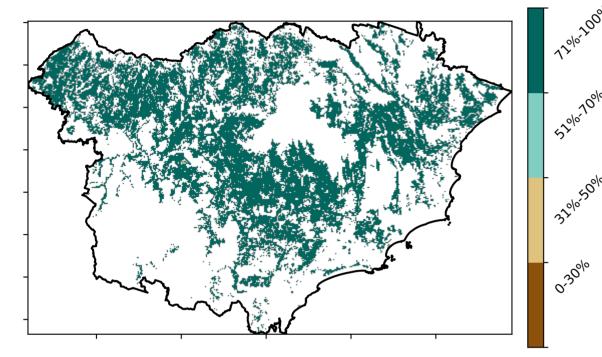




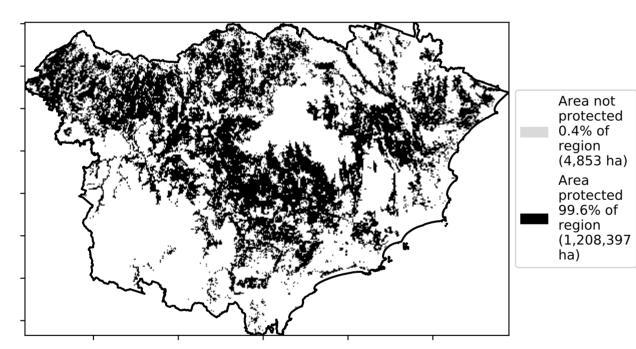
## **Grazing non forest**

Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Agriculture - Grazing - Non forest Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

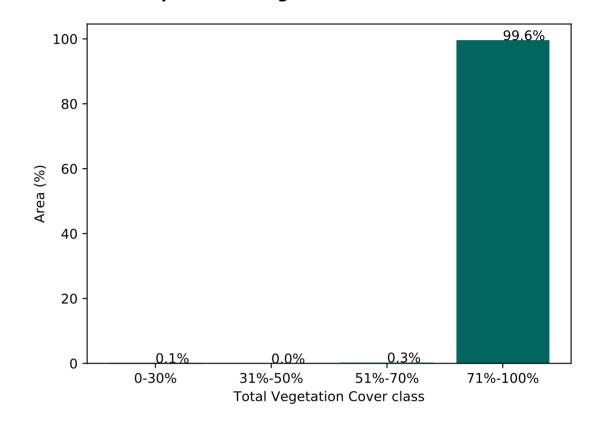
**Total Vegetation Cover [%]** 



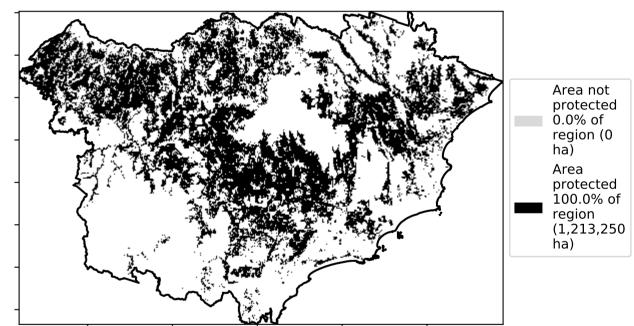
% Area protected from water erosion (>70%)



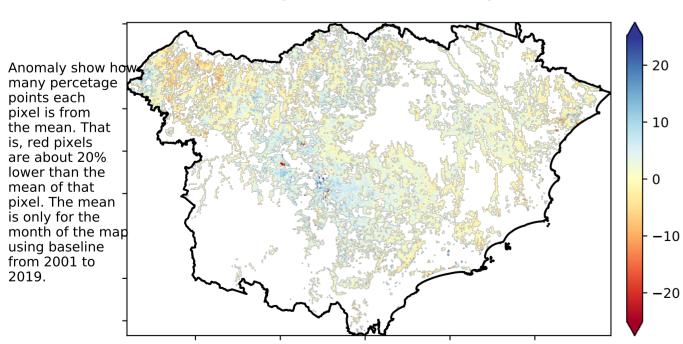
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

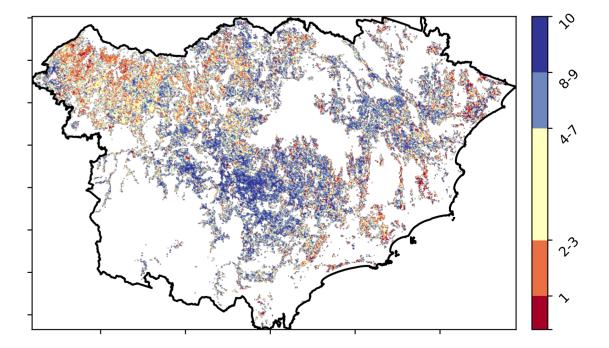


Total Vegetation Cover Anomaly [%]

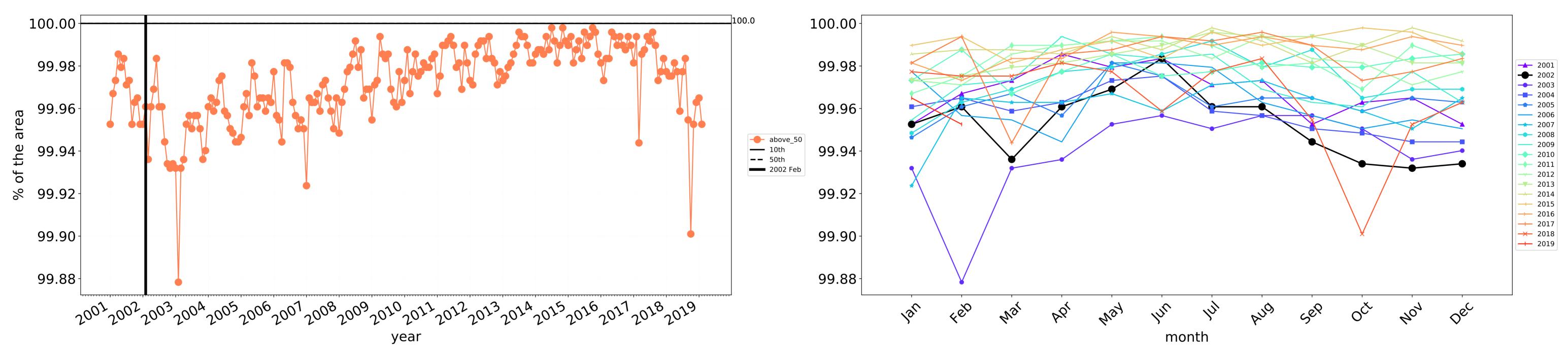


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**Total Vegetation Cover Decile [%]** 

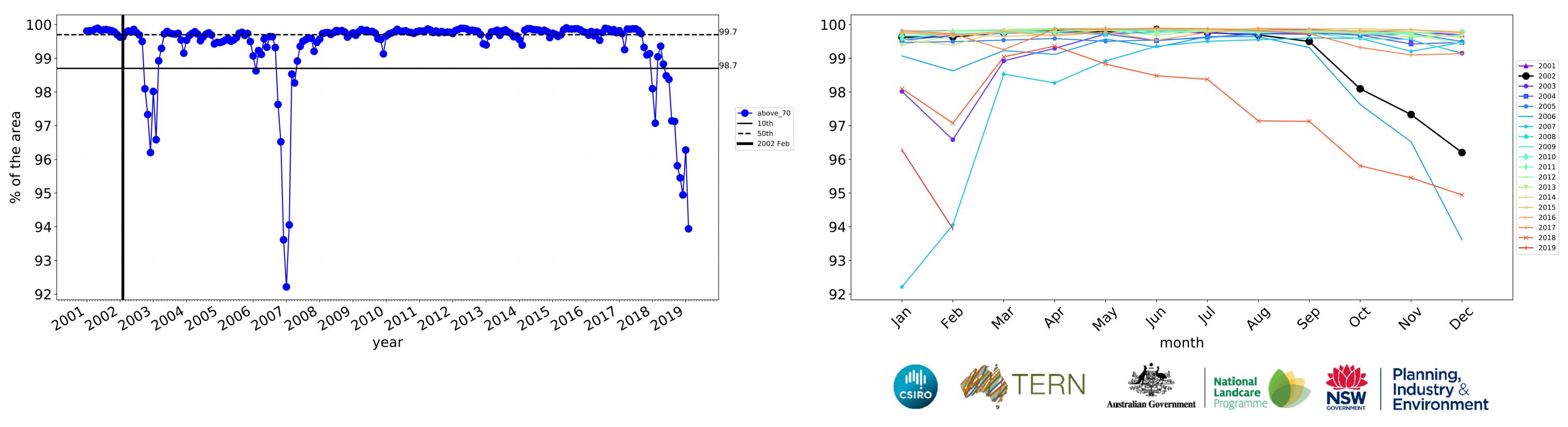




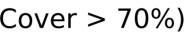


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

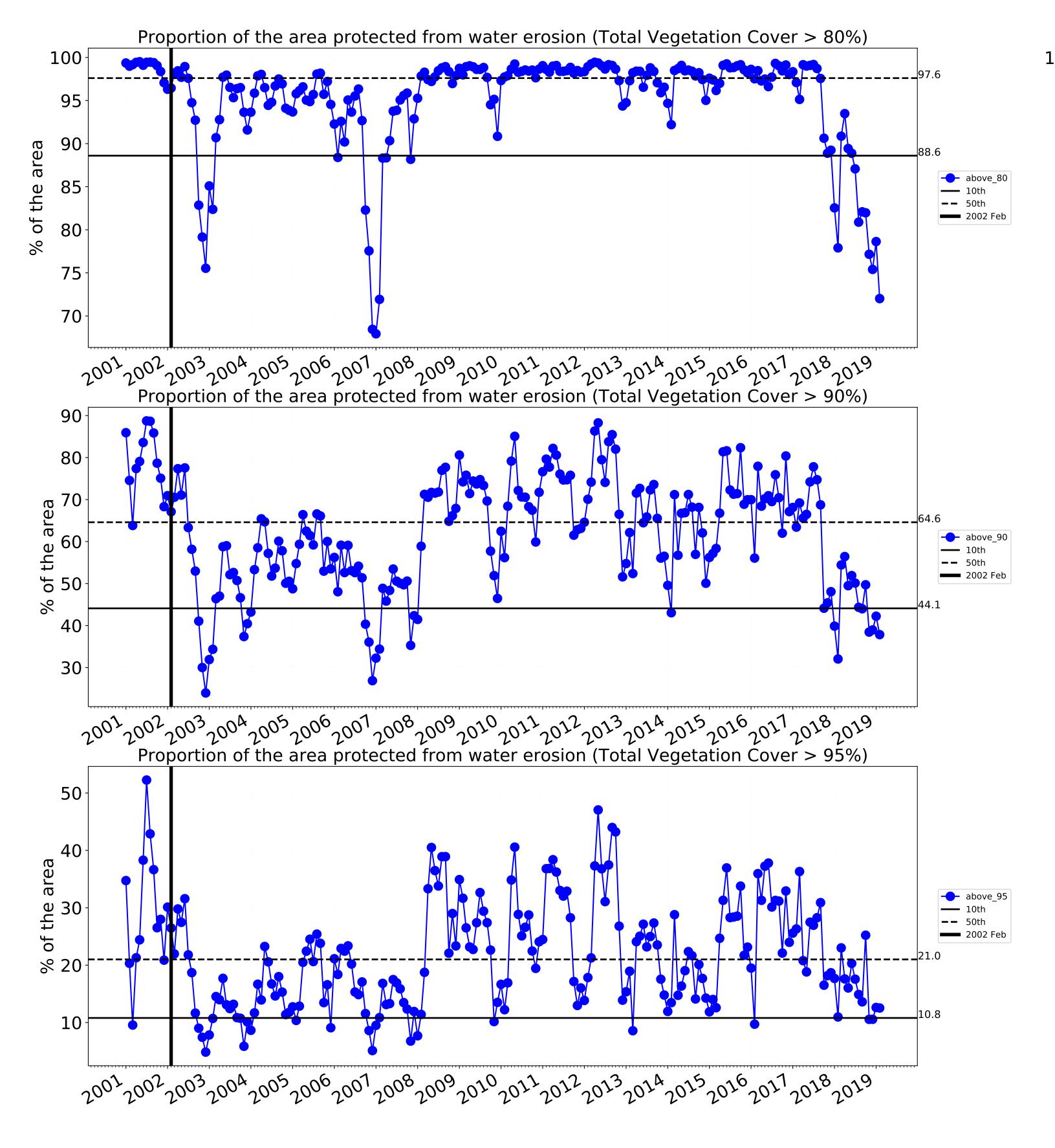
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

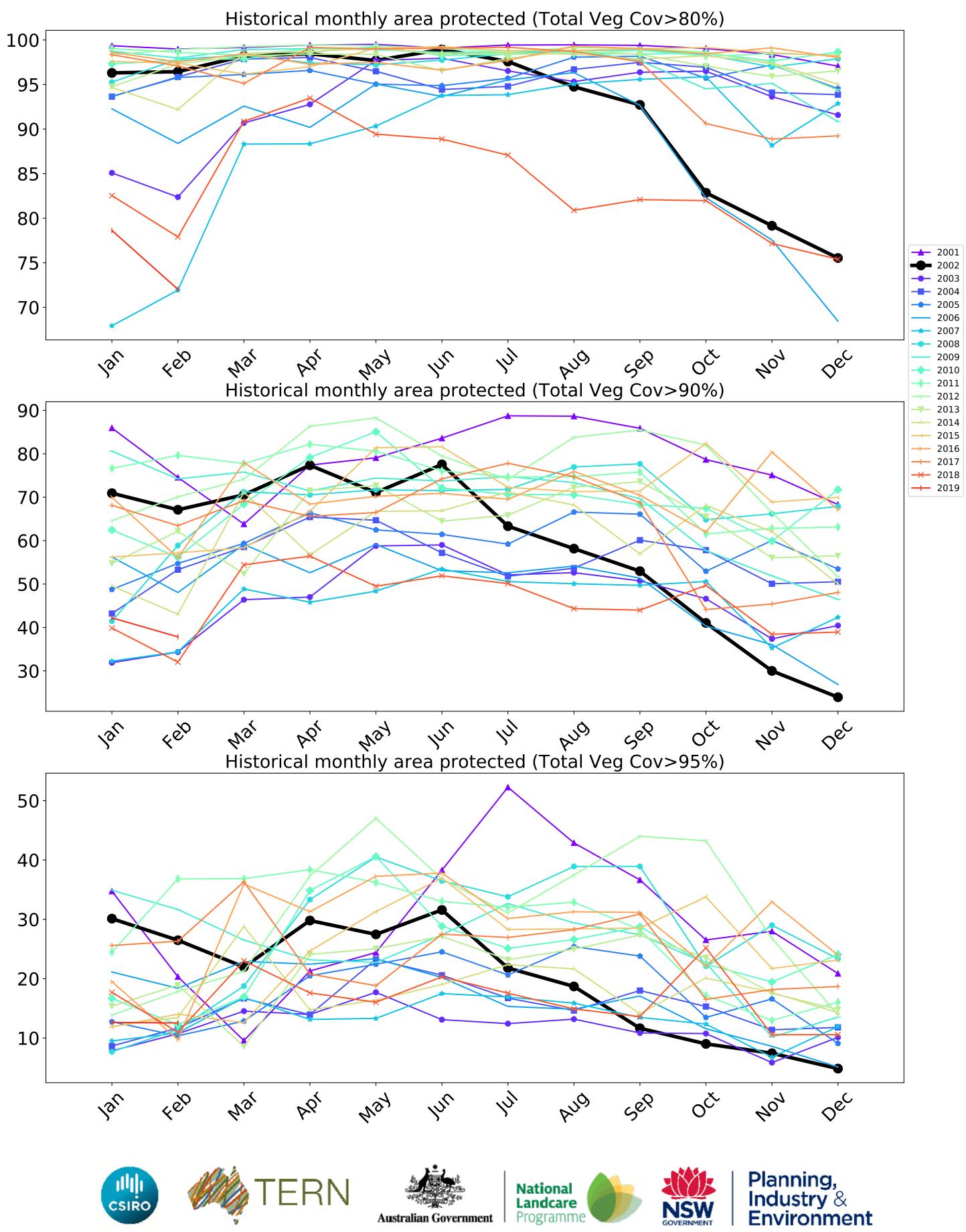


Wind erosion historical monthly area protected (Total Veg Cov >50%)



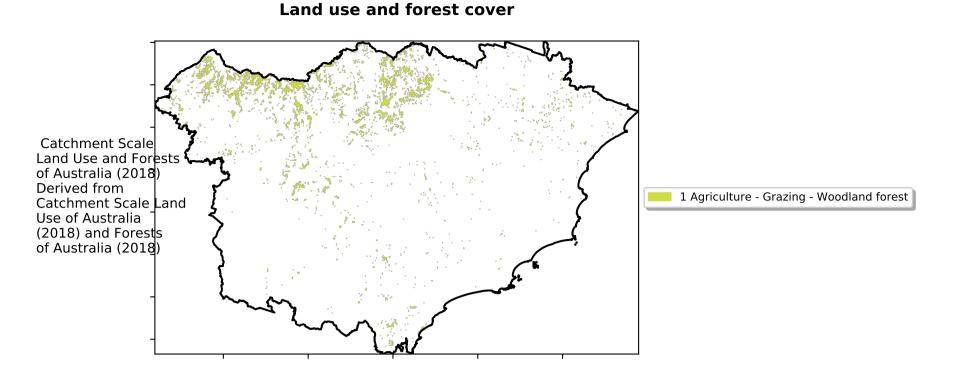
Water erosion historical monthly area protected (Total Veg Cov>70%)



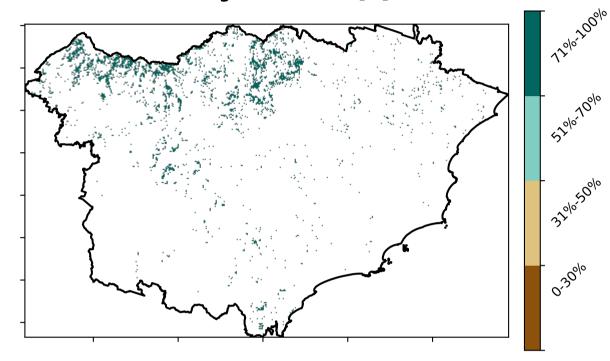




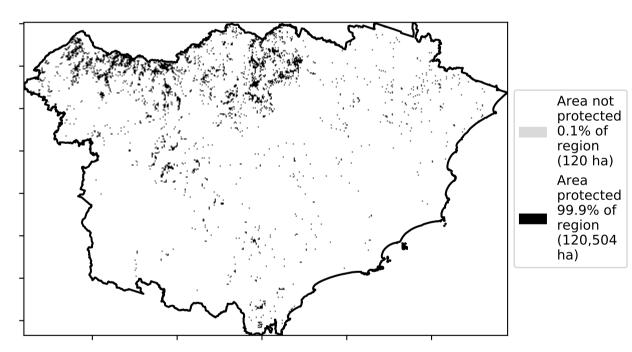
## **Grazing Woodland forest**



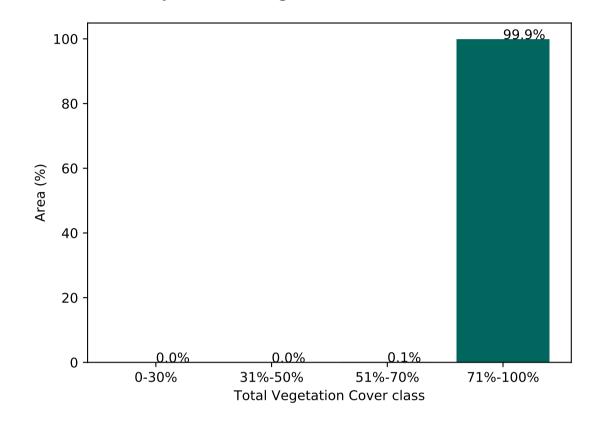
**Total Vegetation Cover [%]** 



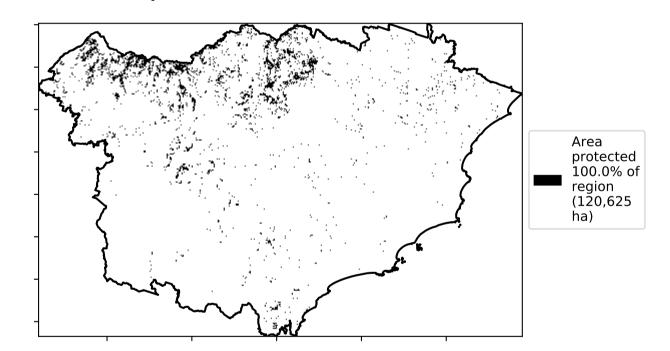
% Area protected from water erosion (>70%)



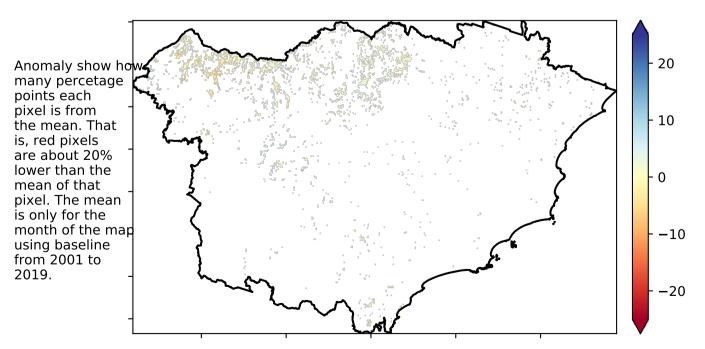
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

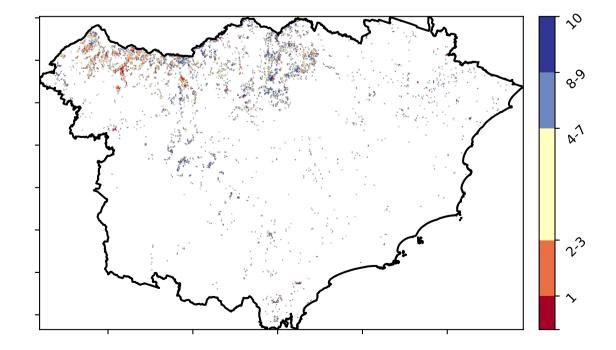


**Total Vegetation Cover Anomaly [%]** 

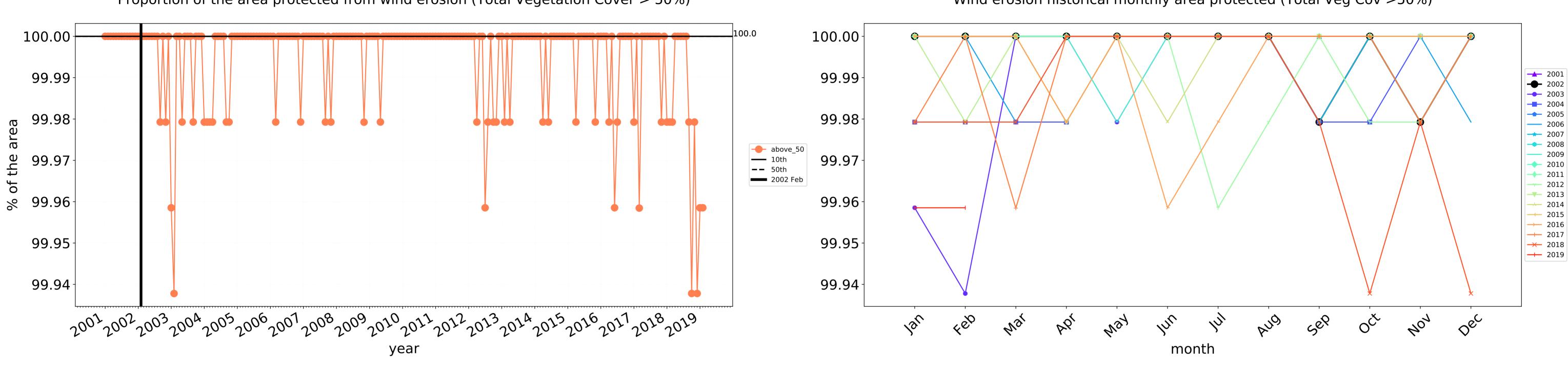


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]

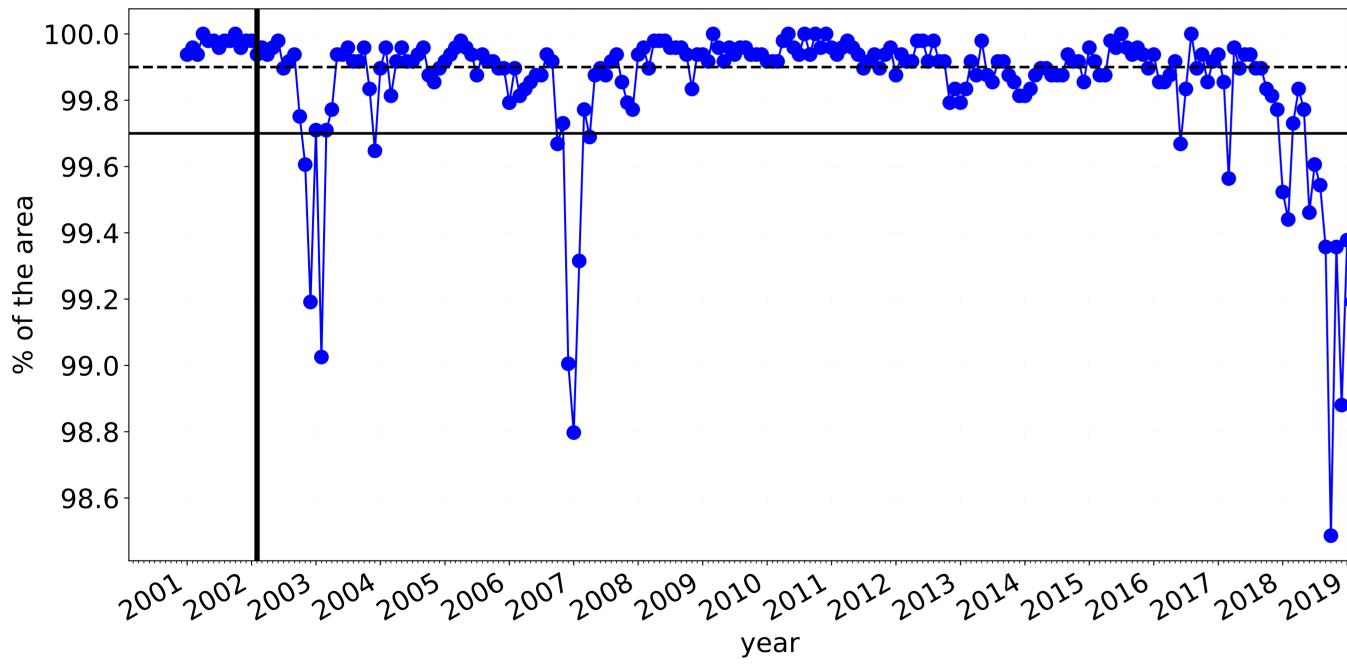






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

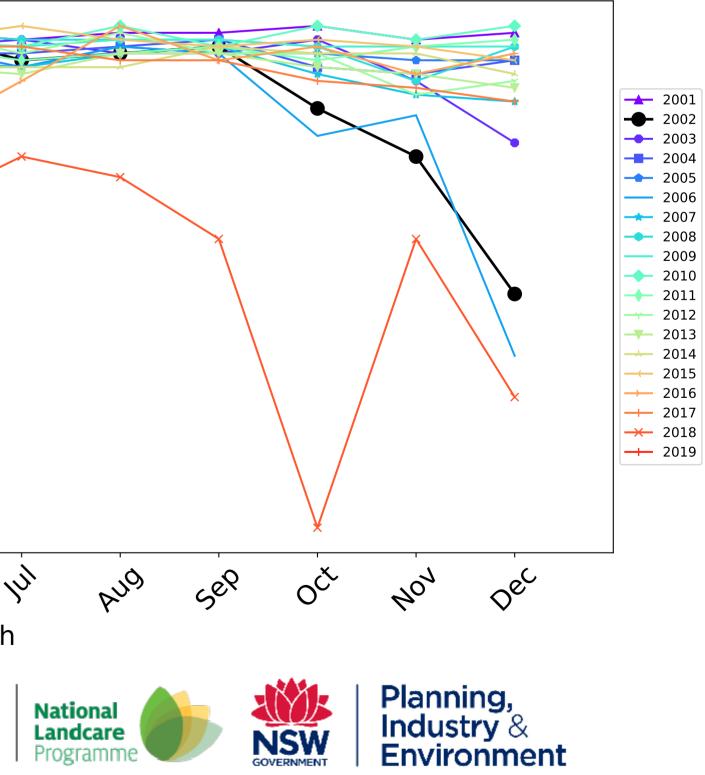
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

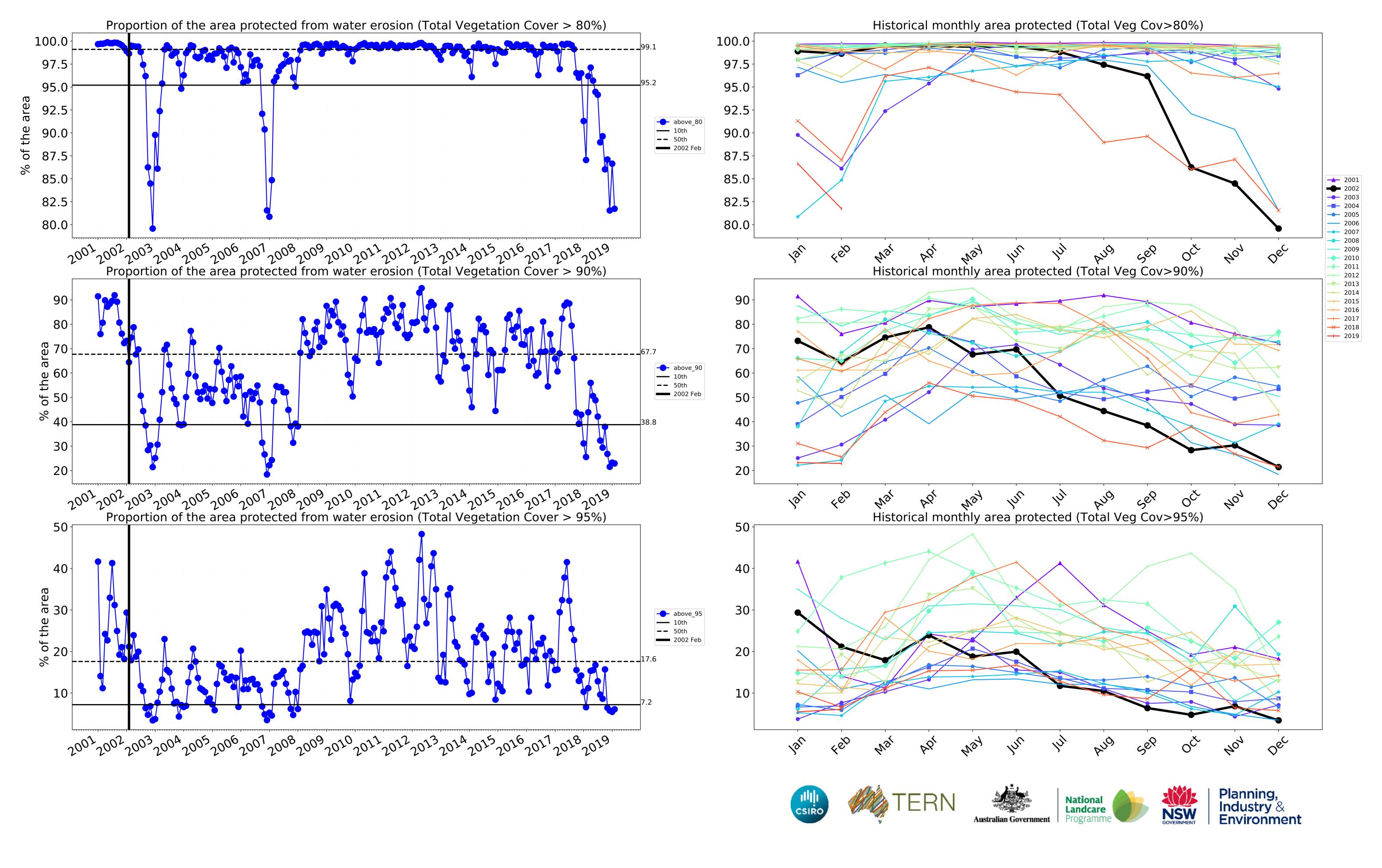




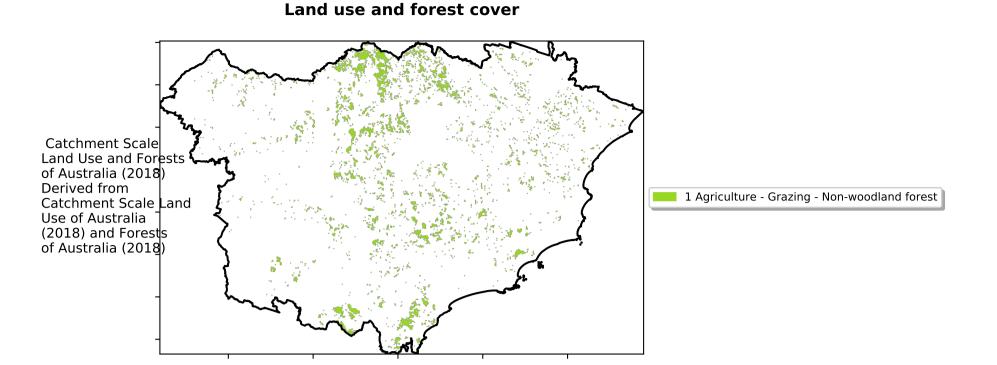
100.0 99.8 99.6 ---- above\_70 **—** 10th 99.4 **——** 50th 2002 Feb 99.2 99.0 98.8 98.6 feb lar May In Mai PQ month ΓERN CSIRO Australian Government

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

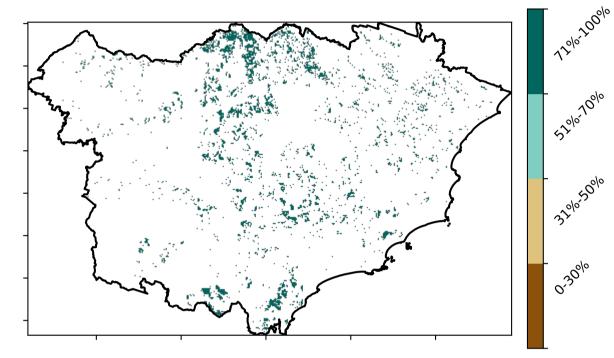




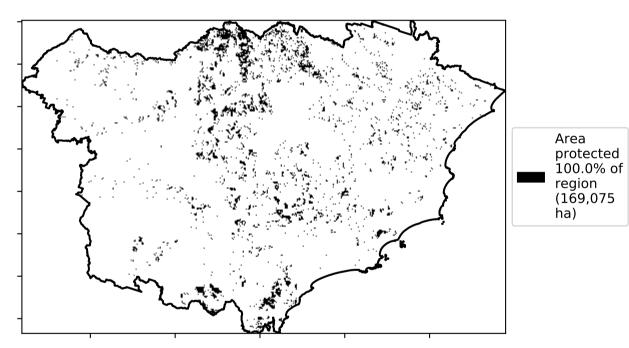
#### Grazing - Forest (non woodland)



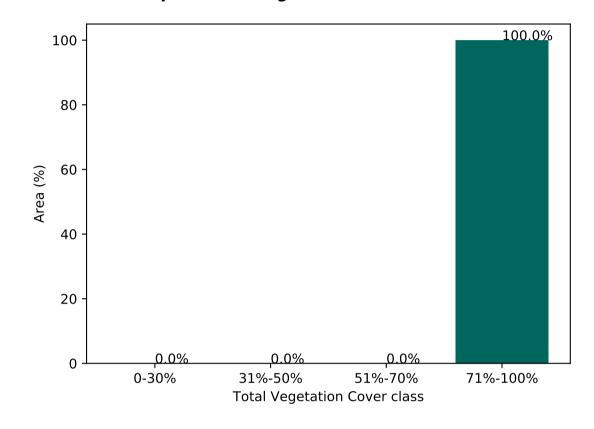
**Total Vegetation Cover [%]** 



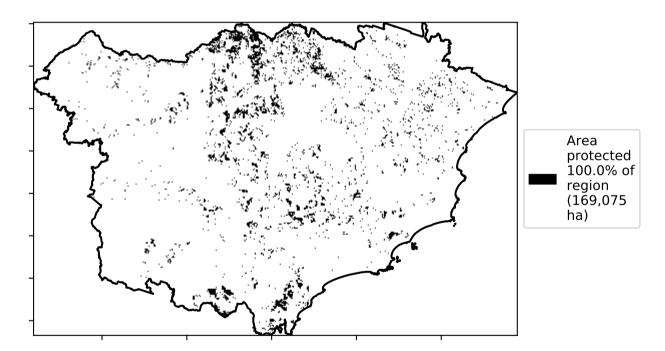
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

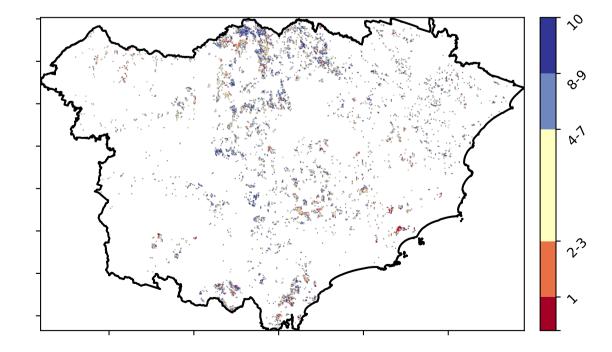


**Total Vegetation Cover Anomaly [%]** 

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.

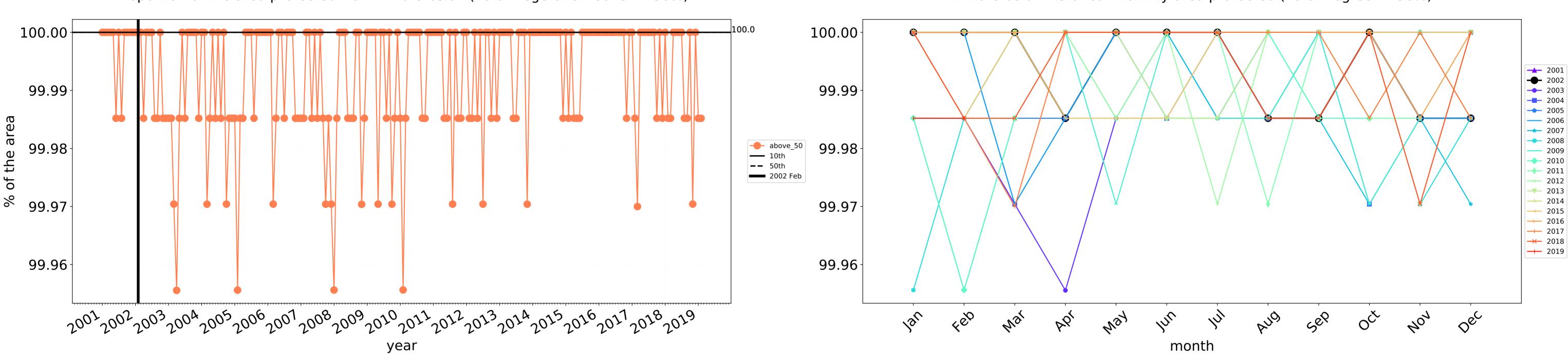
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



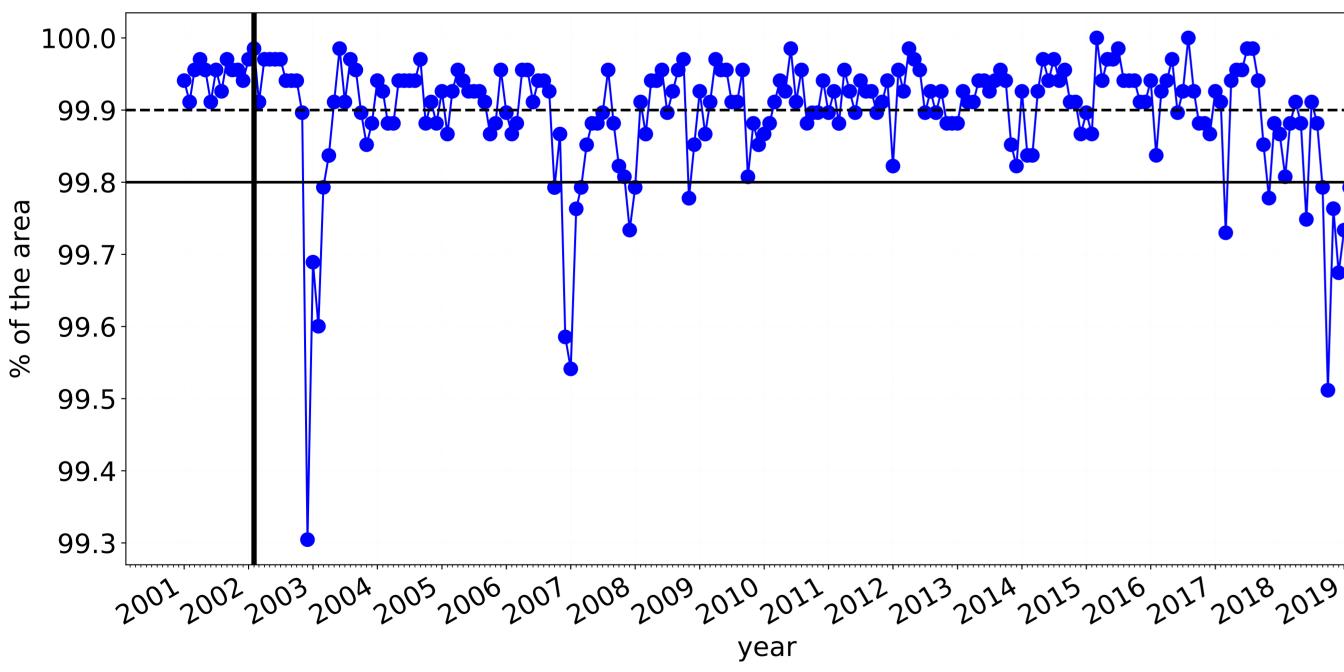


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Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



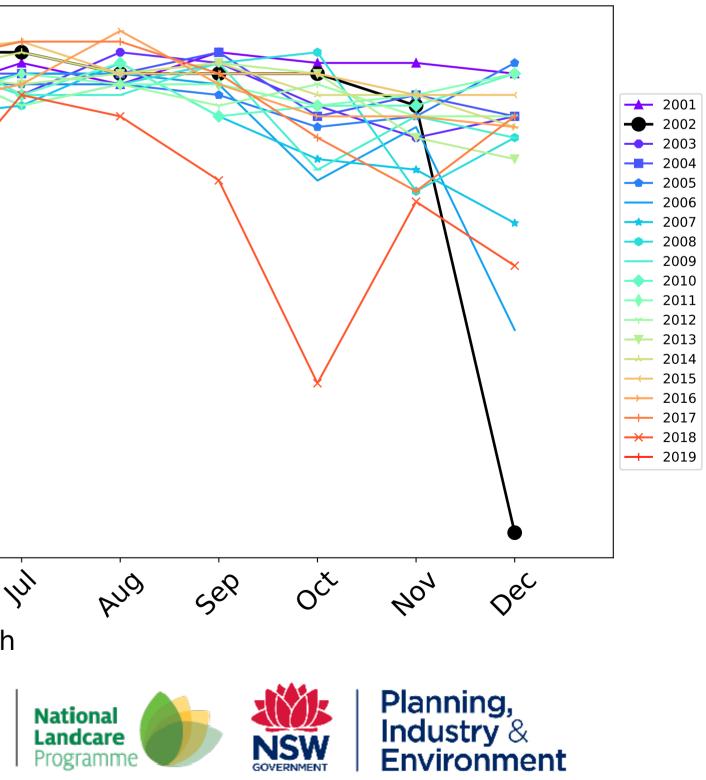
Wind erosion historical monthly area protected (Total Veg Cov >50%)

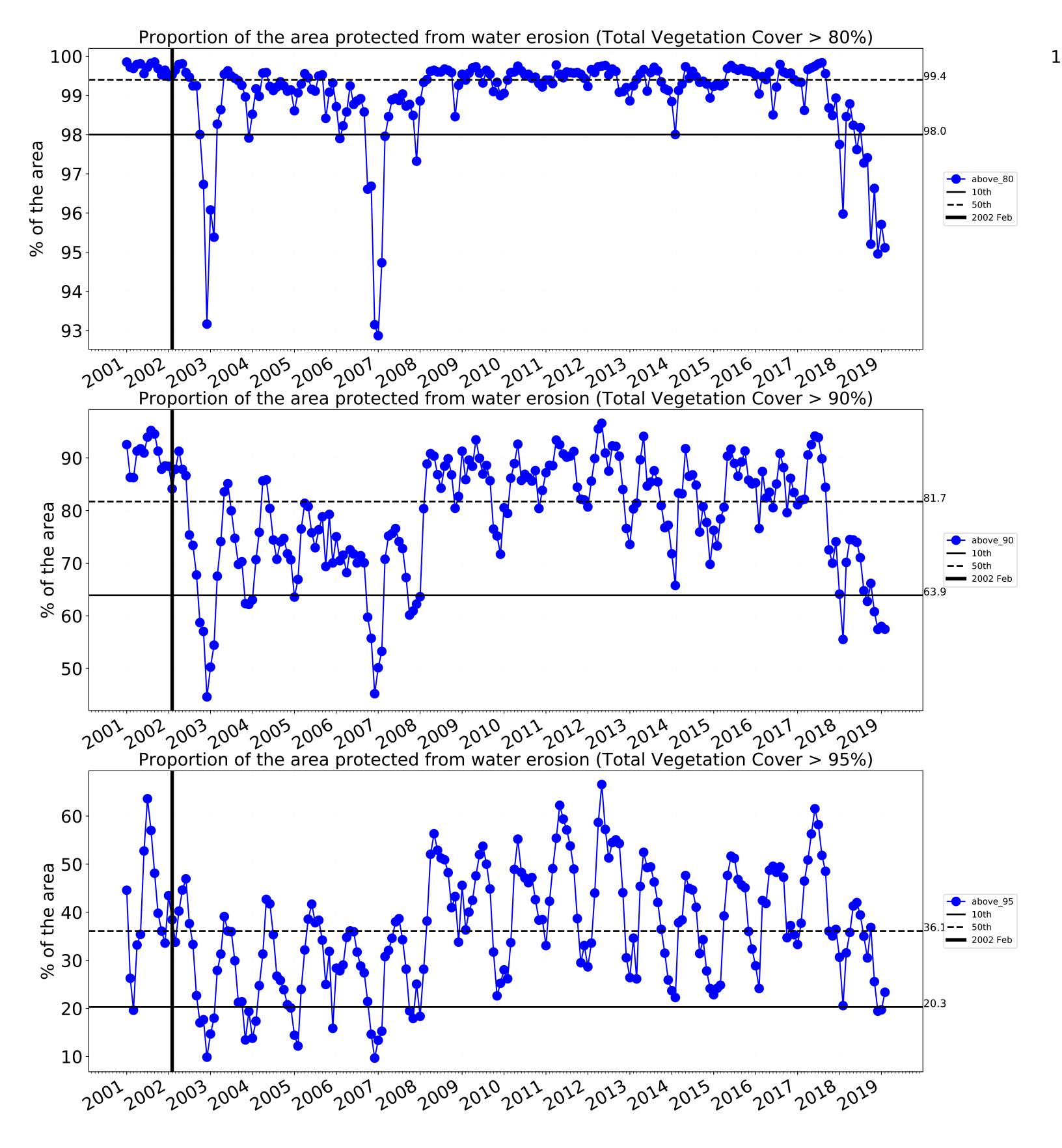


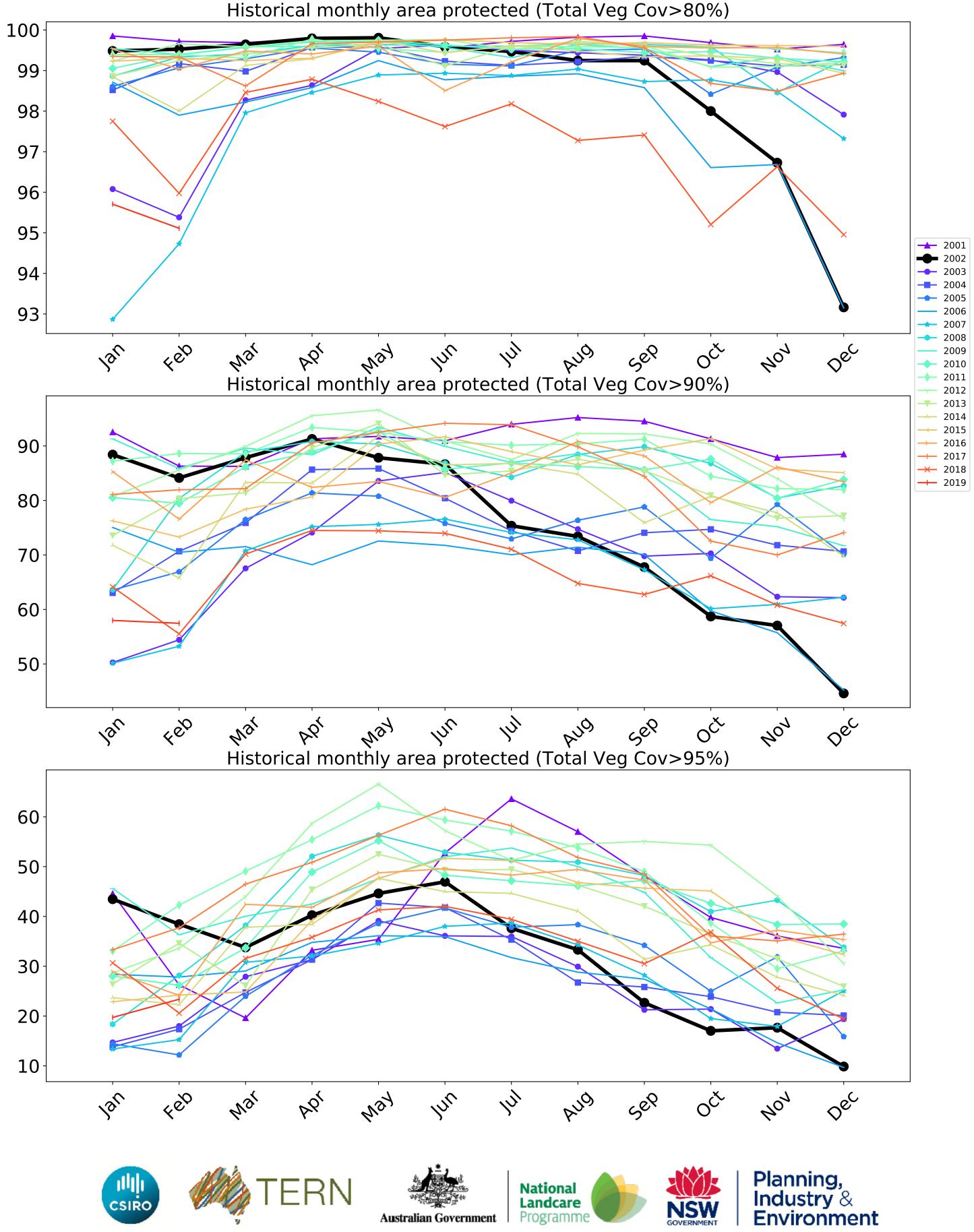
100.0-99.9 99.8 --- above\_70 **—** 10th **--** 50th 99.7 **——** 2002 Feb 99.6 99.5 99.4 99.3 feb lar In May PQ Mai month ERN CSIRO Australian Government

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





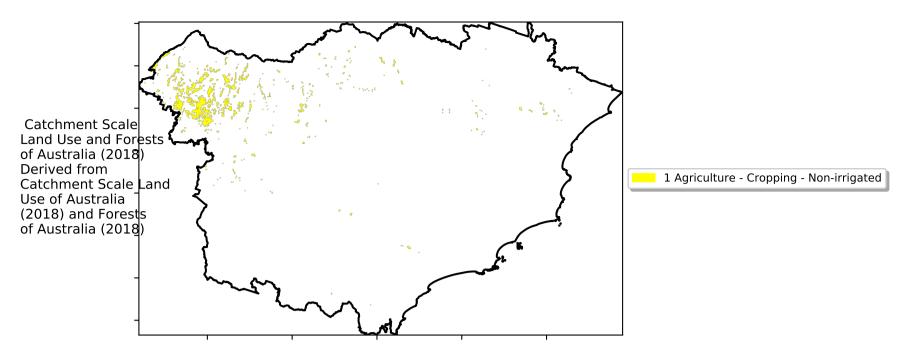




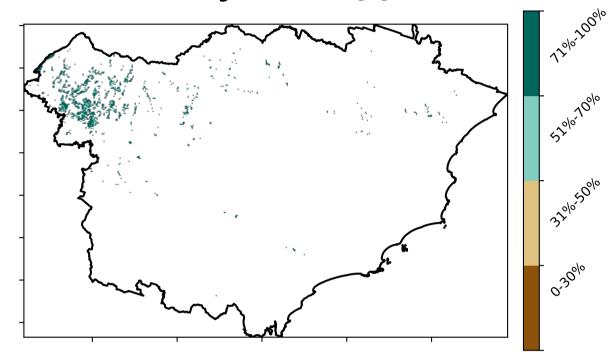
Australian Government

## Cropping

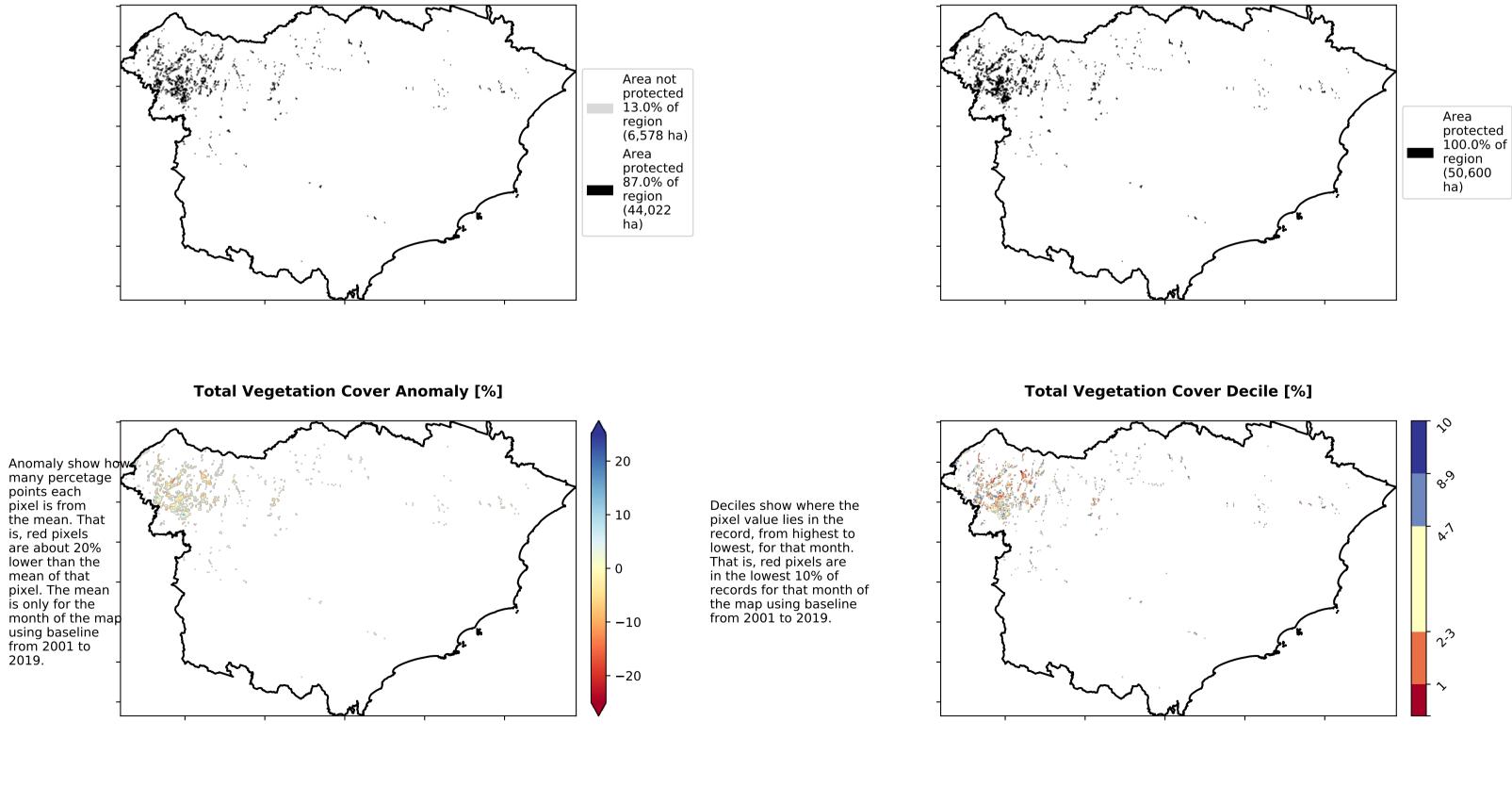
Land use and forest cover



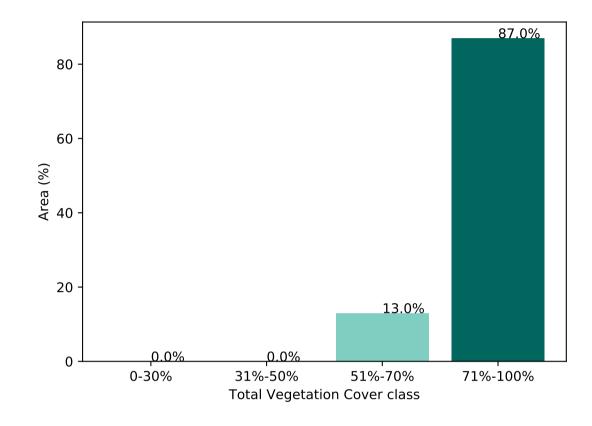
**Total Vegetation Cover [%]** 



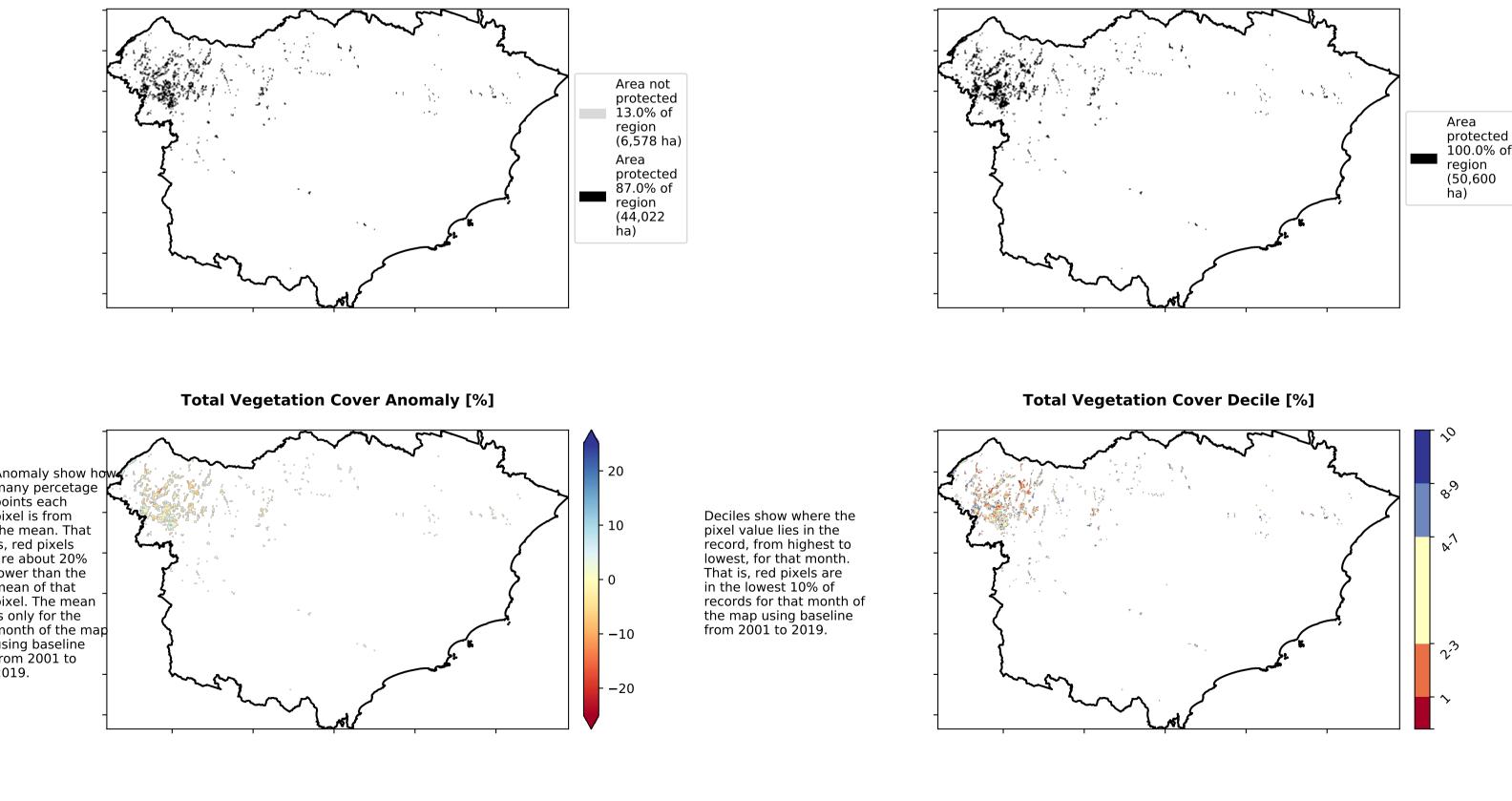
% Area protected from water erosion (>70%)



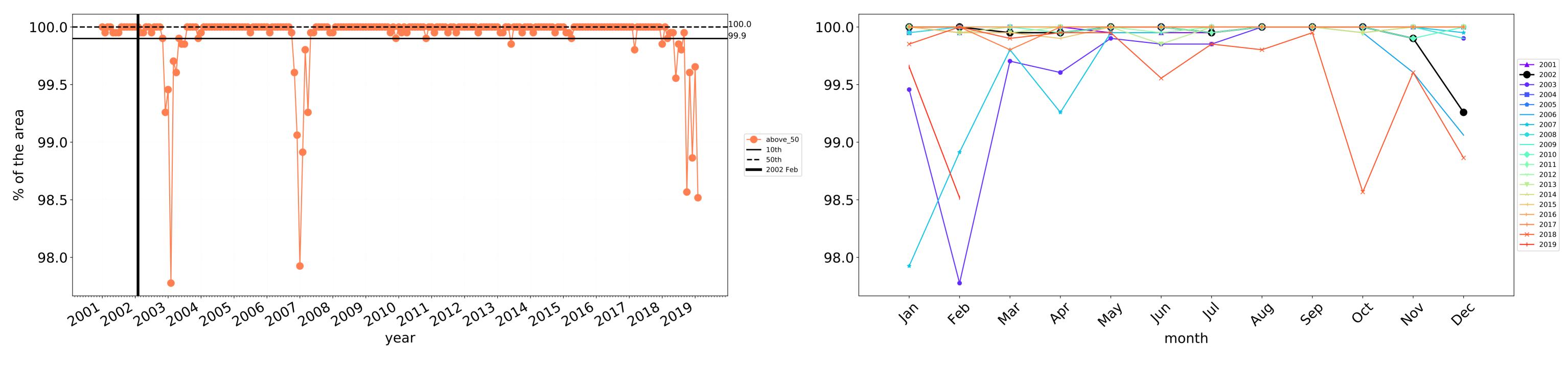
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

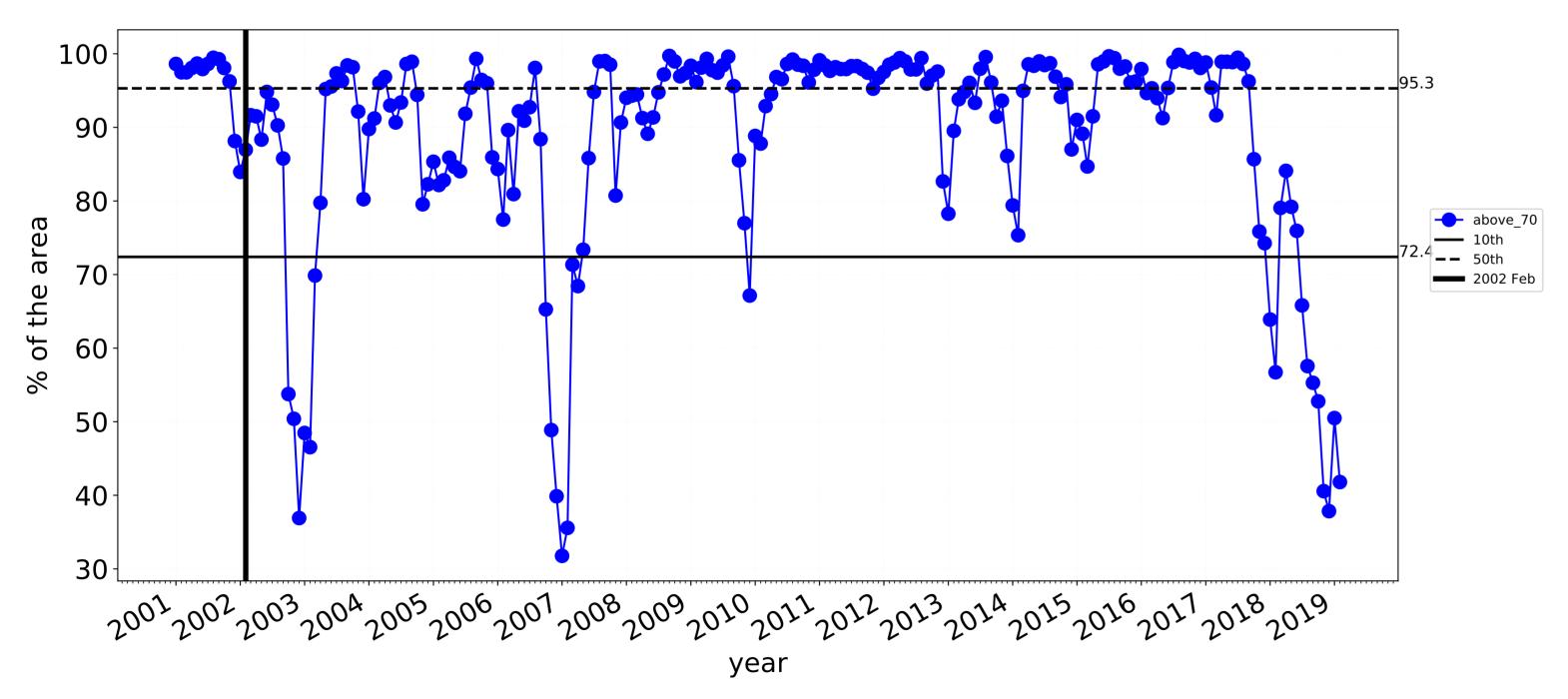






Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

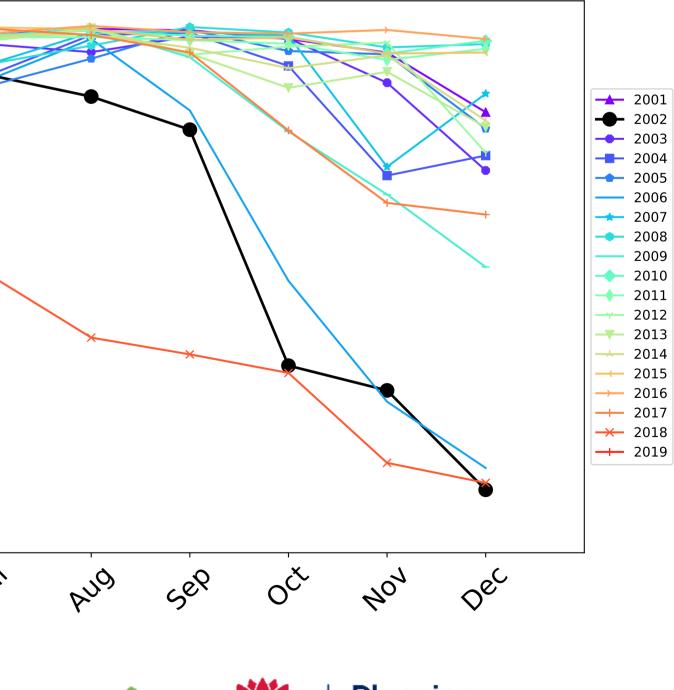
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



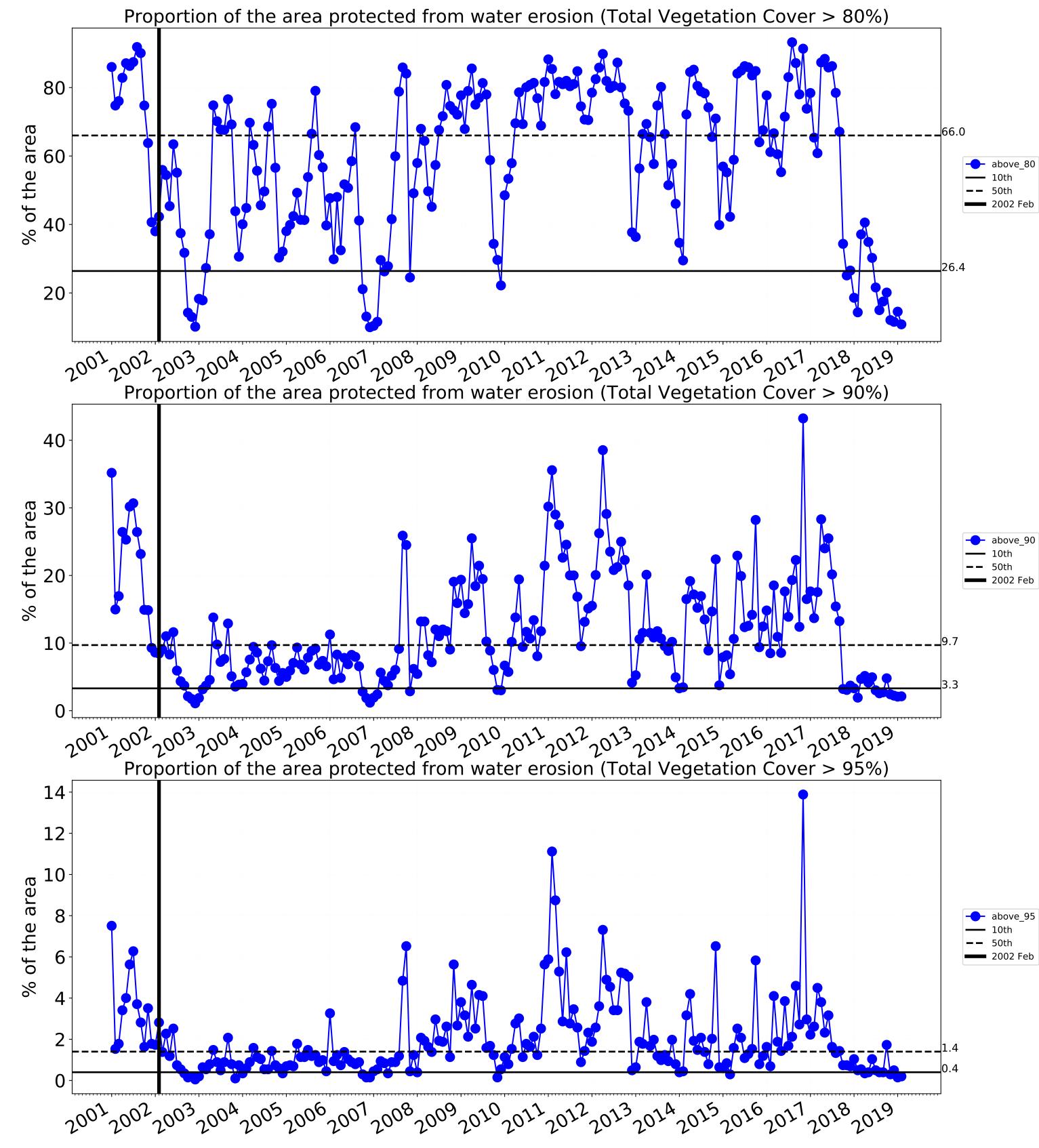
Wind erosion historical monthly area protected (Total Veg Cov >50%)

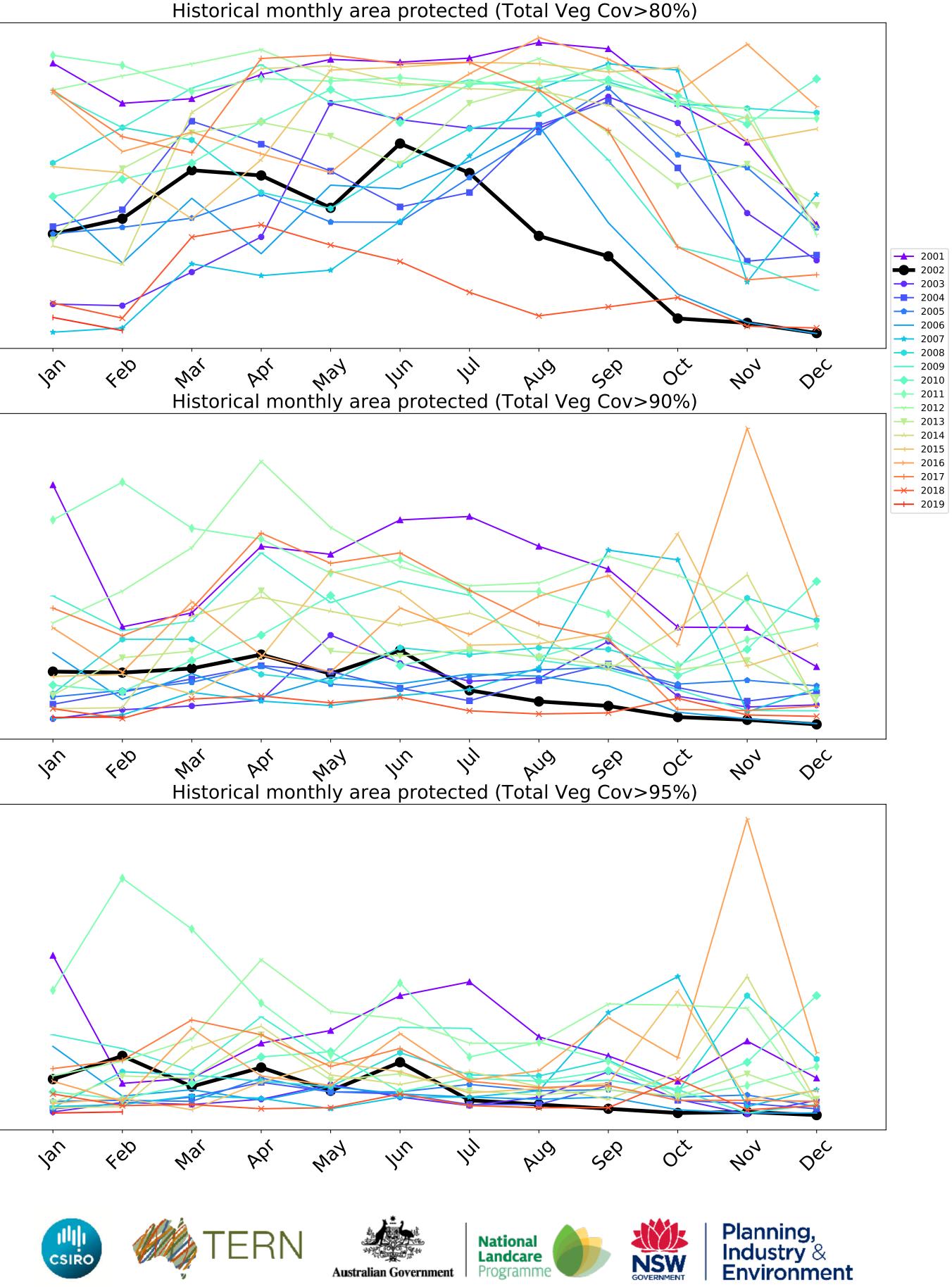
 $100^{-1}$ 90 80 70 60 50 40-30 Jan 4eb May Mai PQ In 1st month FERN (SOL) CSIRO Australian Government

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







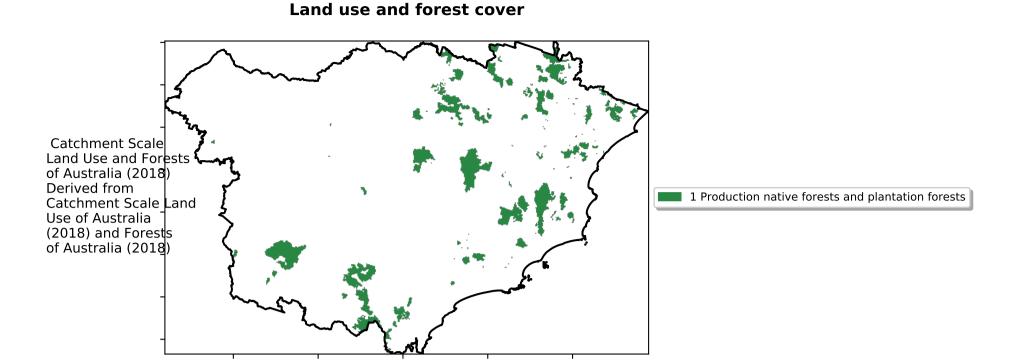


Programm

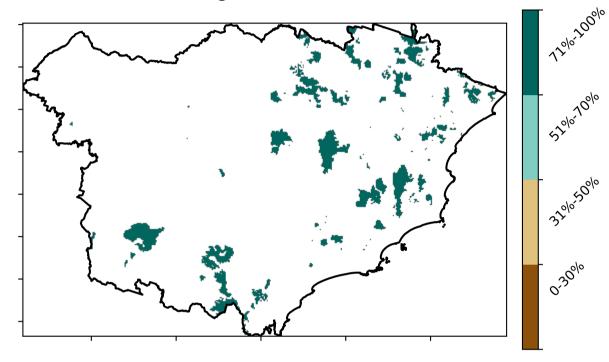


 $\mathbf{0}$ 

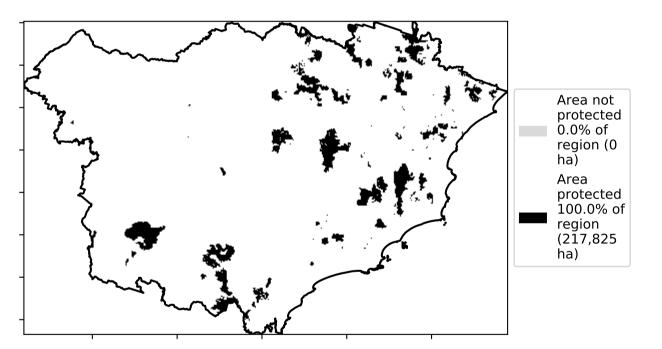
## **Production native forests and plantation forests**



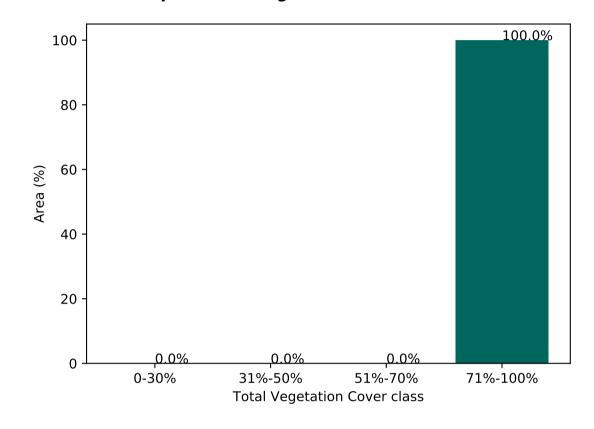
**Total Vegetation Cover [%]** 



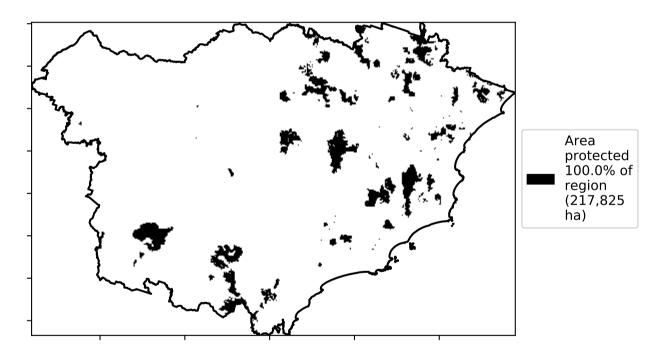
% Area protected from water erosion (>70%)



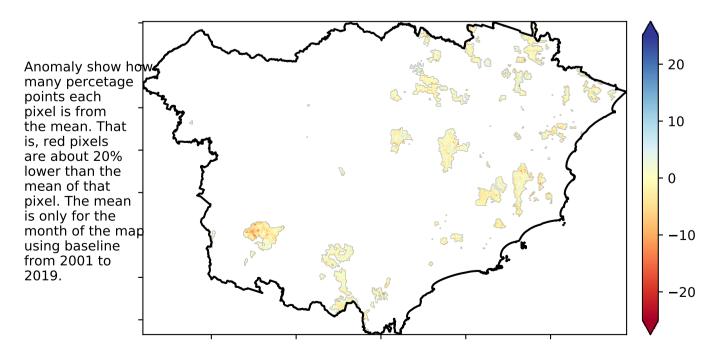
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

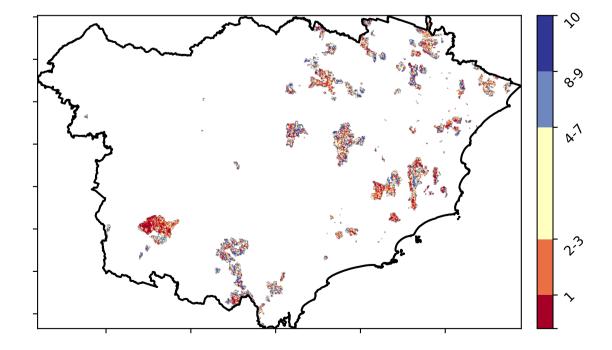


Total Vegetation Cover Anomaly [%]

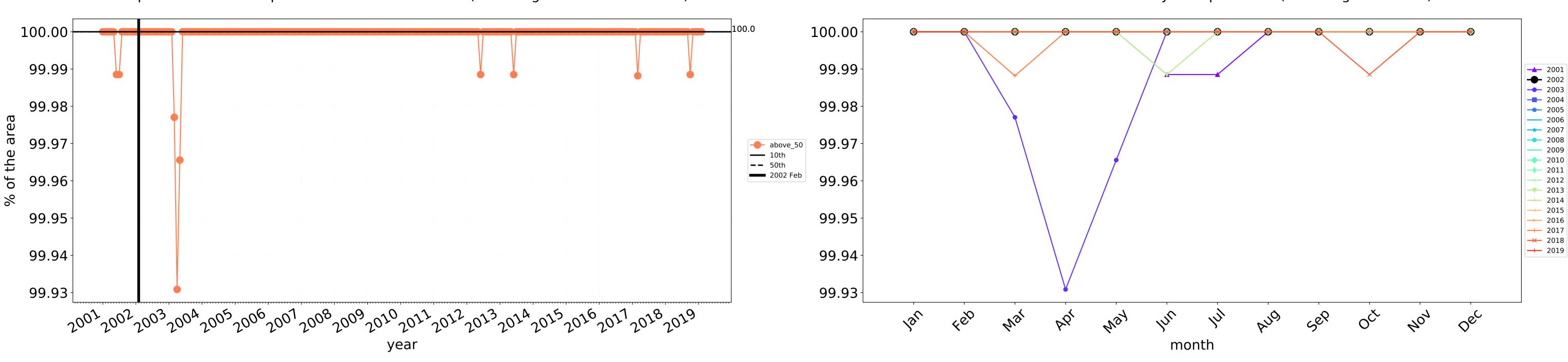


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Total Vegetation Cover Decile [%]

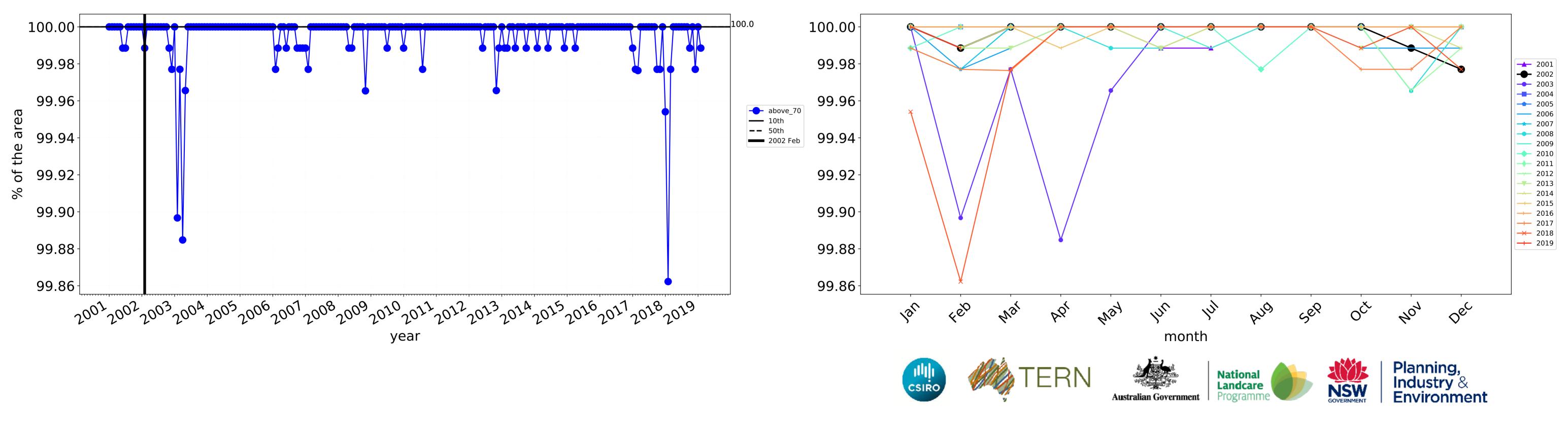






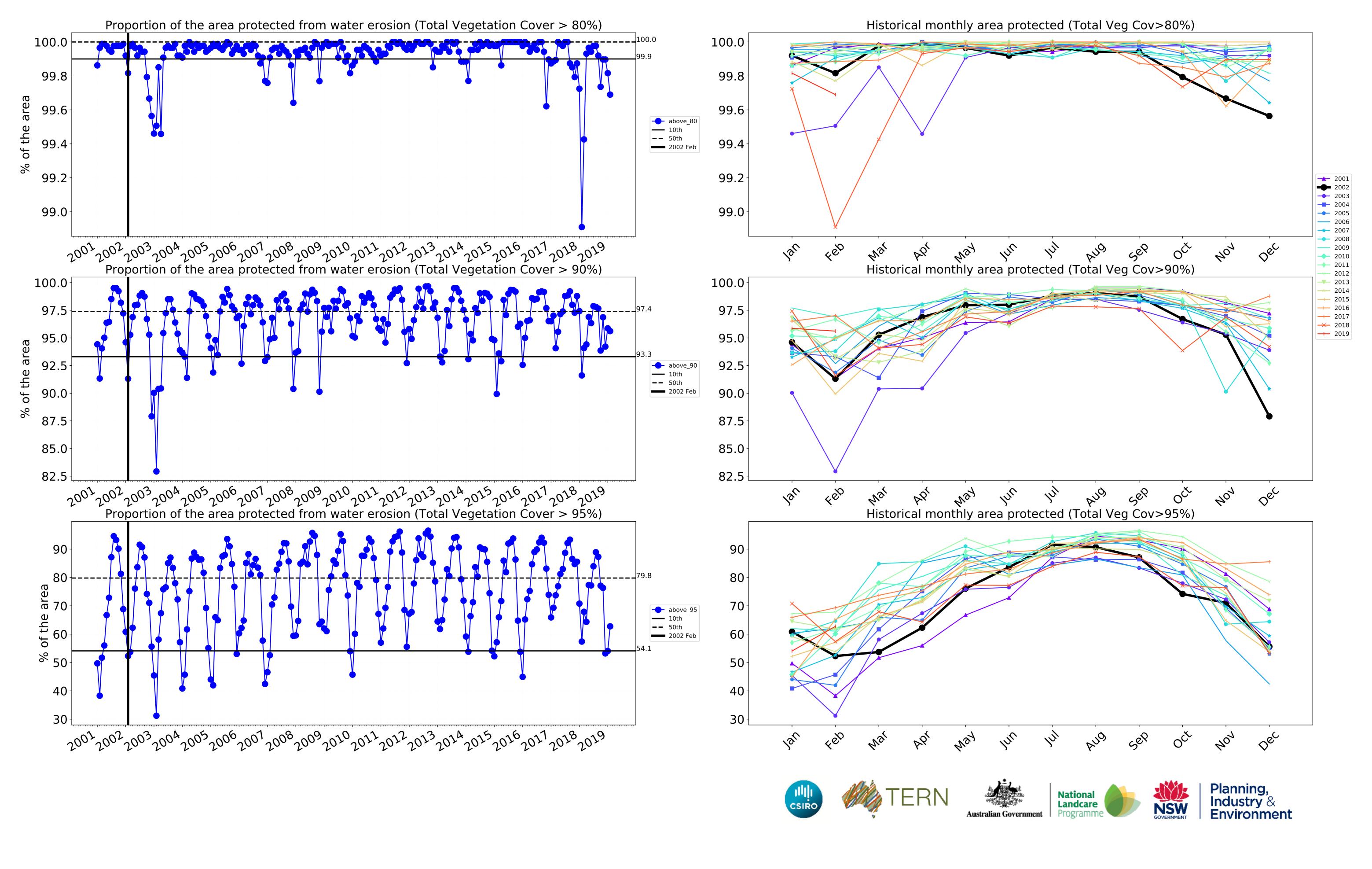
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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



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

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



# Hunter (3,239,175 ha and no data 61,250 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	3,239,175	99.9% 3,236,977	99.8% 3,232,081	98.8% 3,201,184	95.4% 3,089,962	74.1% 2,399,770	34.1% 1,105,584
Conservation and natural environments	1,240,800	99.9% 1,239,475	99.8% 1,238,800	99.7% 1,236,625	98.8% 1,226,275	86.9% 1,078,675	44.5% 551,625
Conservation and natural environments non forest	31,075	96.5% 29,975	94.5% 29,375	91.3% 28,375	88.3% 27,425	65.3% 20,300	27.7% 8,600
Conservation and natural environments Woodland forest Conservation and	139,025	100.0% 139,025	100.0% 139,000	99.9% 138,925	99.4% 138,250	84.9% 118,025	37.8% 52,525
natural environments Forest (non woodland)	1,070,700	100.0% 1,070,475	100.0% 1,070,425	99.9% 1,069,325	99.1% 1,060,600	87.8% 940,350	45.8% 490,500
Agriculture	1,580,925	100.0% 1,580,850	100.0% 1,580,450	99.3% 1,569,675	94.9% 1,501,025	66.0% 1,043,525	26.2% 414,225
Grazing	1,502,950	100.0% 1,502,875	100.0% 1,502,475	99.7% 1,498,400	97.0% 1,457,400	68.8% 1,034,075	27.4% 411,725
Grazing non forest	1,213,250	100.0% 1,213,175	100.0% 1,212,775	99.6% 1,208,800	96.4% 1,170,150	67.1% 814,125	26.5% 321,200
Grazing Woodland forest	120,625	100.0% 120,625	100.0% 120,625	99.9% 120,550	98.6% 118,975	64.4% 77,700	21.2% 25,525
Grazing - Forest (non woodland)	169,075	100.0% 169,075	100.0% 169,075	100.0% 169,050	99.5% 168,275	84.1% 142,250	38.4% 65,000
Cropping	50,600	100.0% 50,600	100.0% 50,600	87.0% 44,000	42.3% 21,400	8.4% 4,275	2.8% 1,425
Production native forests and plantation forests	217,825	100.0% 217,825	100.0% 217,825	100.0% 217,800	99.8% 217,425	91.3% 198,900	52.3% 113,875

