Total vegetation cover soil protection Region:NRM West Gippsland VIC

Date: September 2020

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

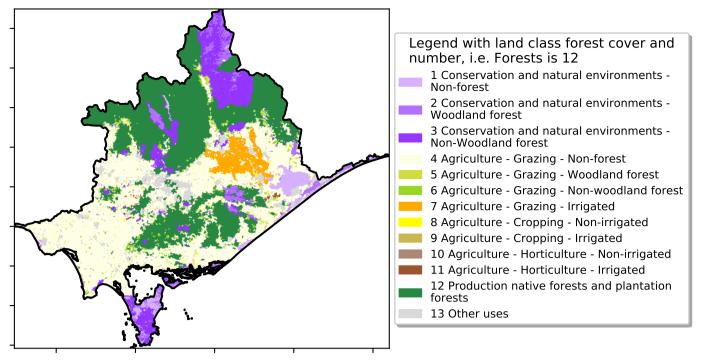


Vegetation Cover Sep 2020

Land use and forest cover

Proportion of each land class in area





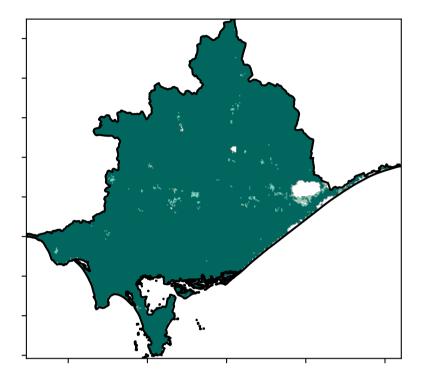
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· 52°10'70°10

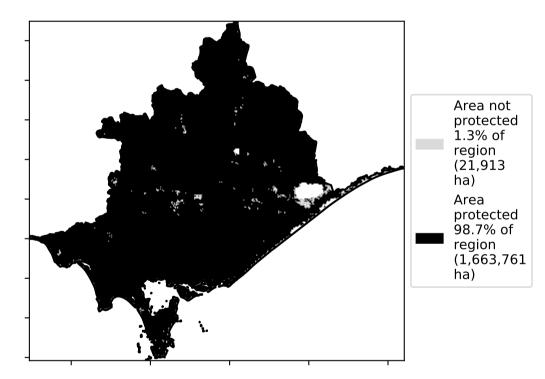
320050010

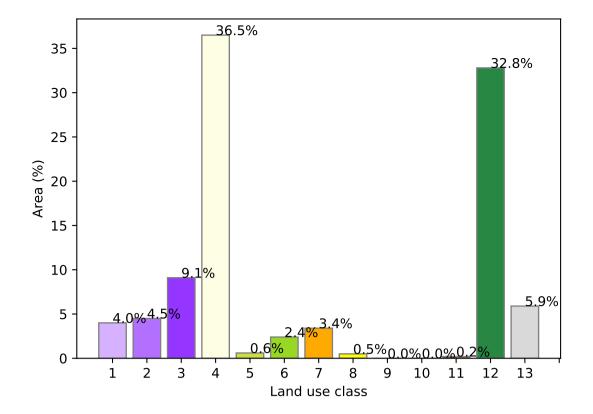
0-30%

Total Vegetation Cover [%]

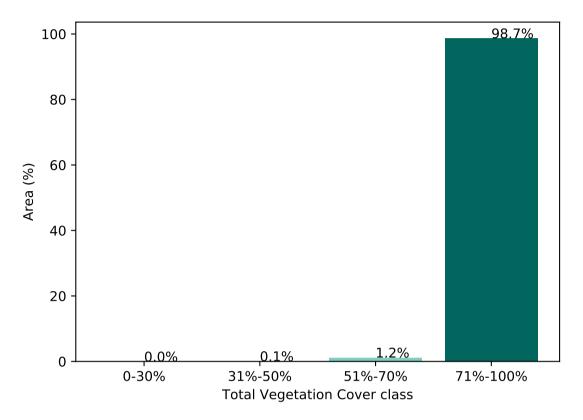


% Area protected from water erosion (>70%)

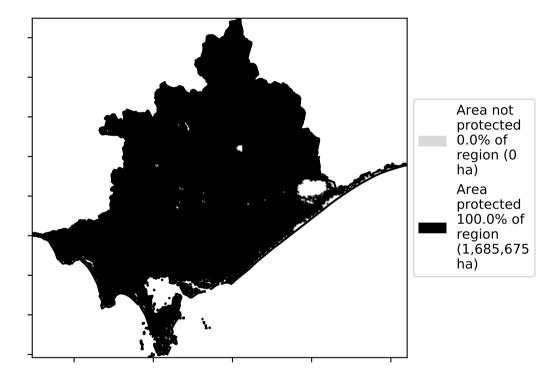




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



 $\sqrt{2}$

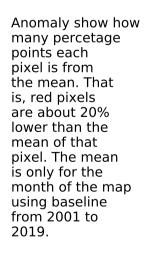
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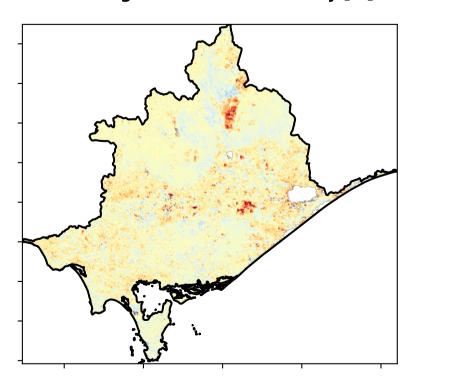
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Total Vegetation Cover Anomaly [%]

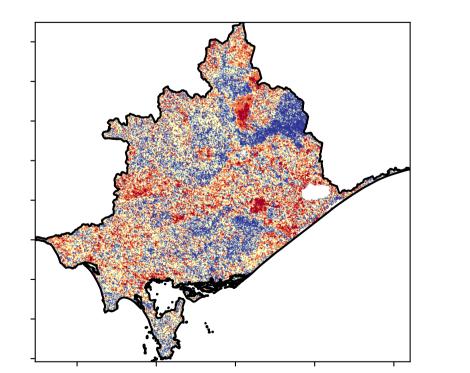
Total Vegetation Cover Decile [%]



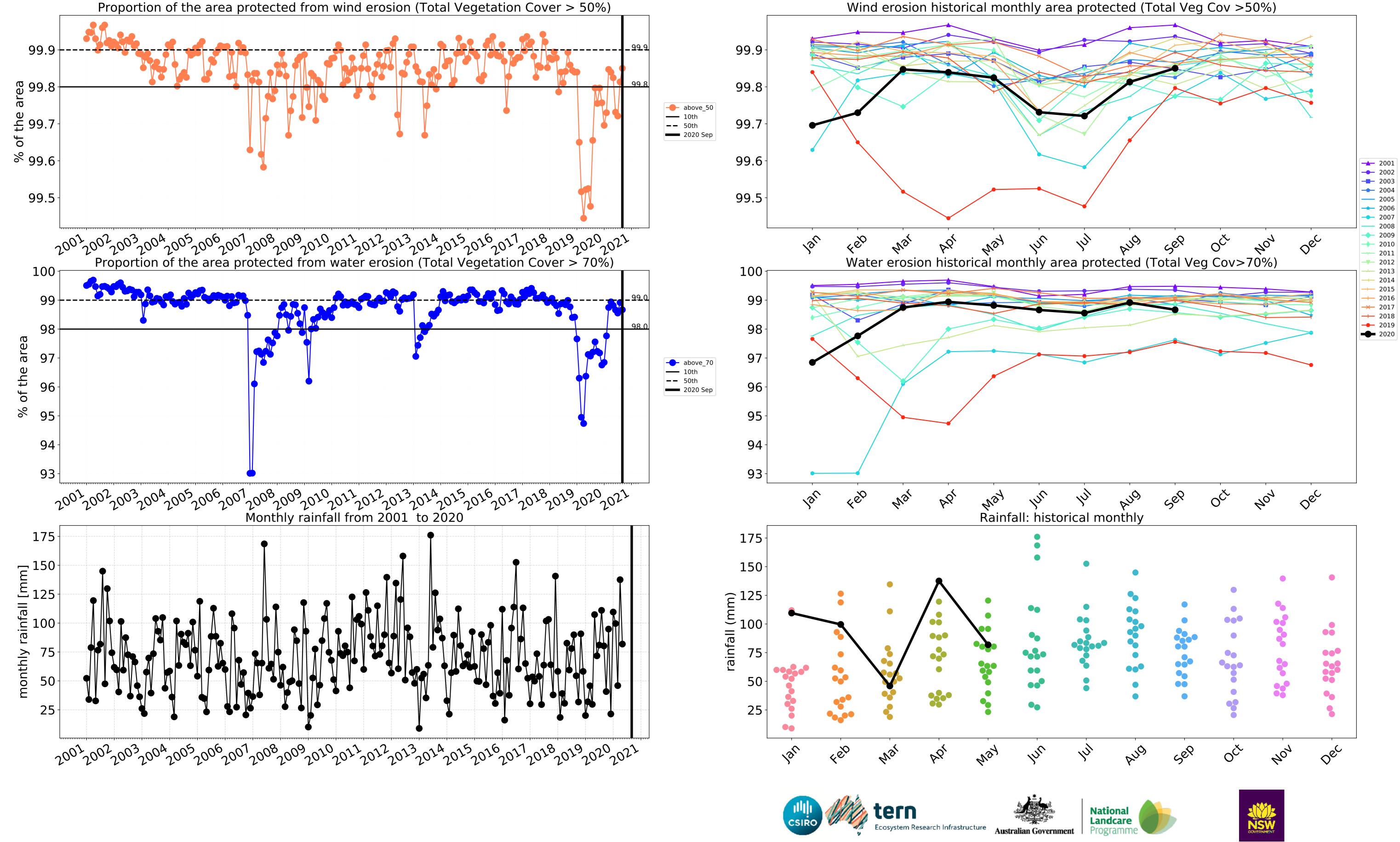


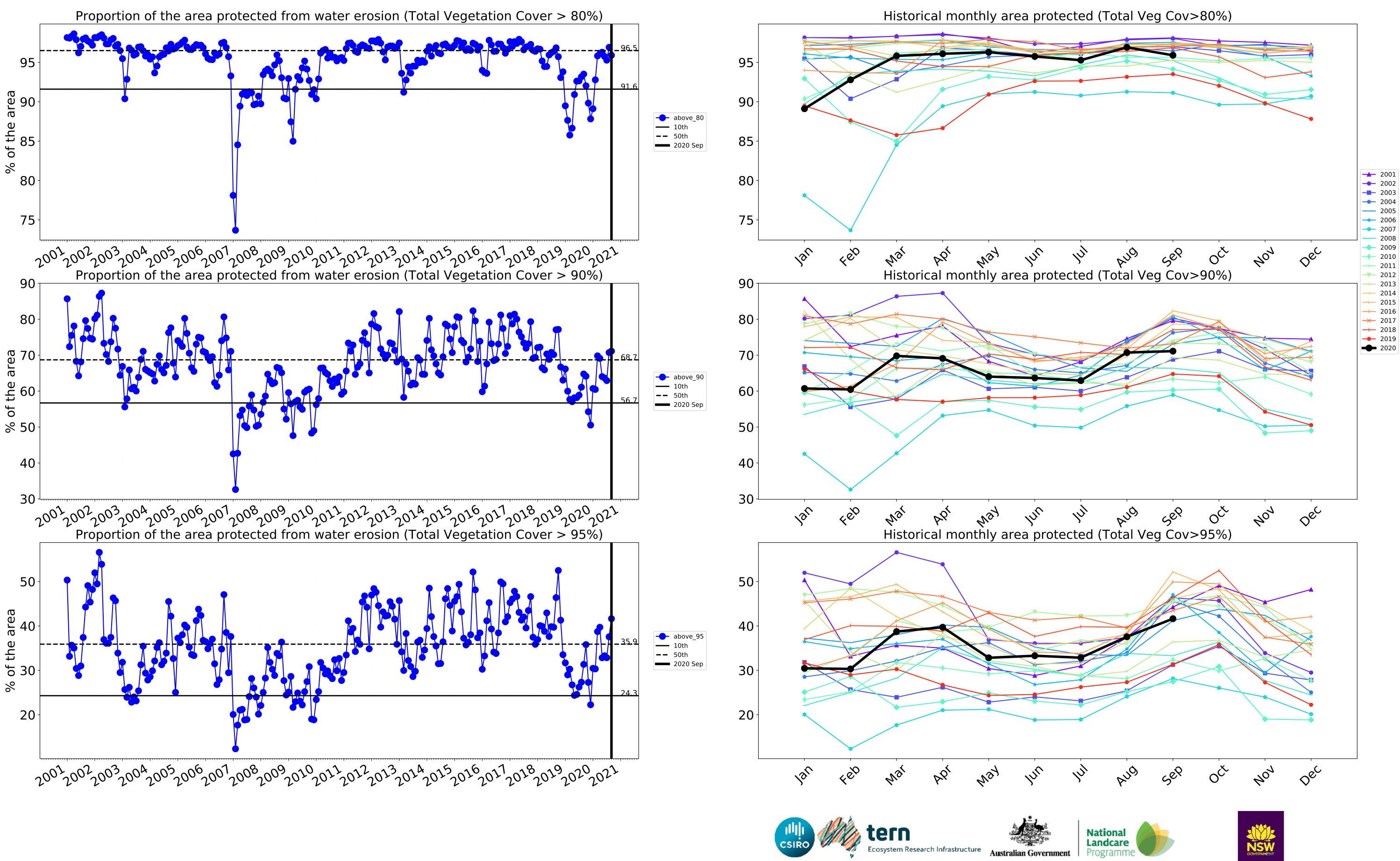
- 20 - 10 - 0 - -10

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

woodland forest

12%-10%

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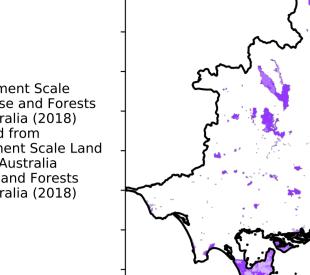
320050010

0.30%

1 Conservation and natural environments - Non-forest

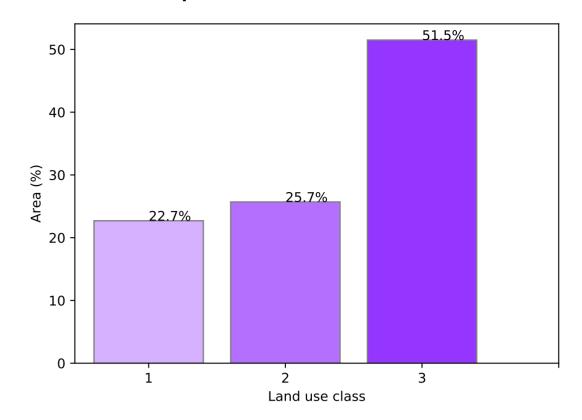
3 Conservation and natural environments - Non-

2 Conservation and natural environments - Woodland

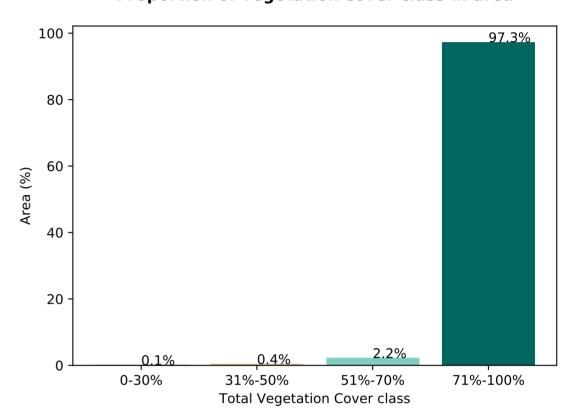


Land use and forest cover

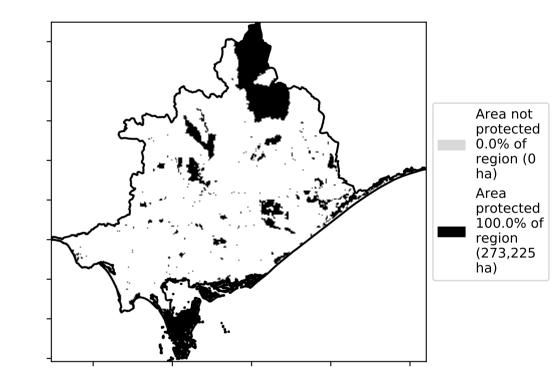
Proportion of each land class in area



Proportion of vegetation cover class in area

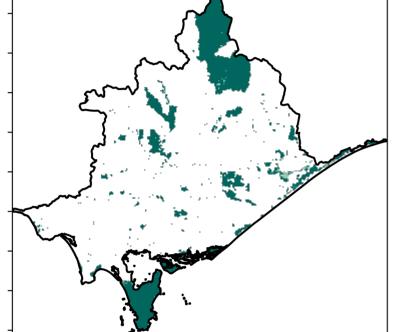


% Area protected from wind erosion (>50%)

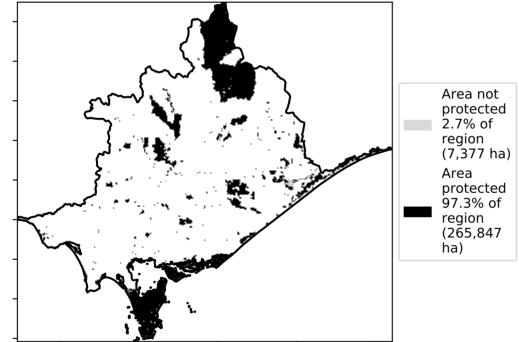


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

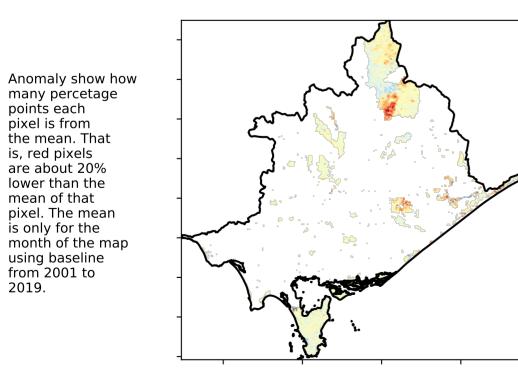
Total Vegetation Cover [%]



% Area protected from water erosion (>70%)



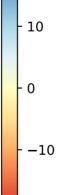
Total Vegetation Cover Anomaly [%]



pixel is from

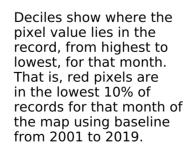
is, red pixels

mean of that

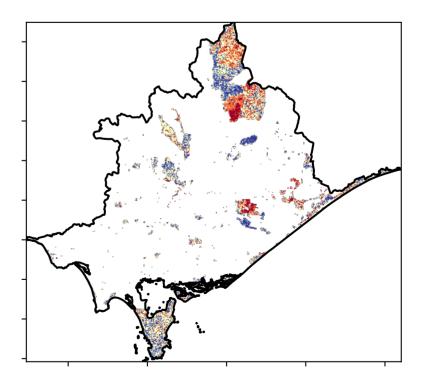


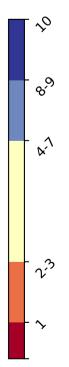
-20

- 20

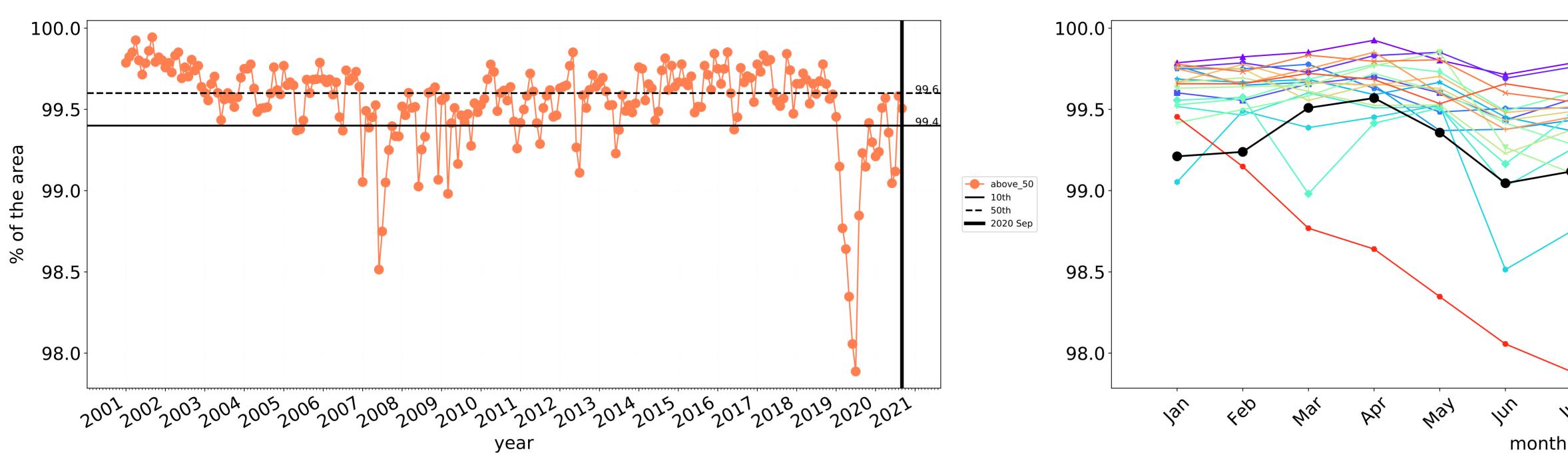


Total Vegetation Cover Decile [%]

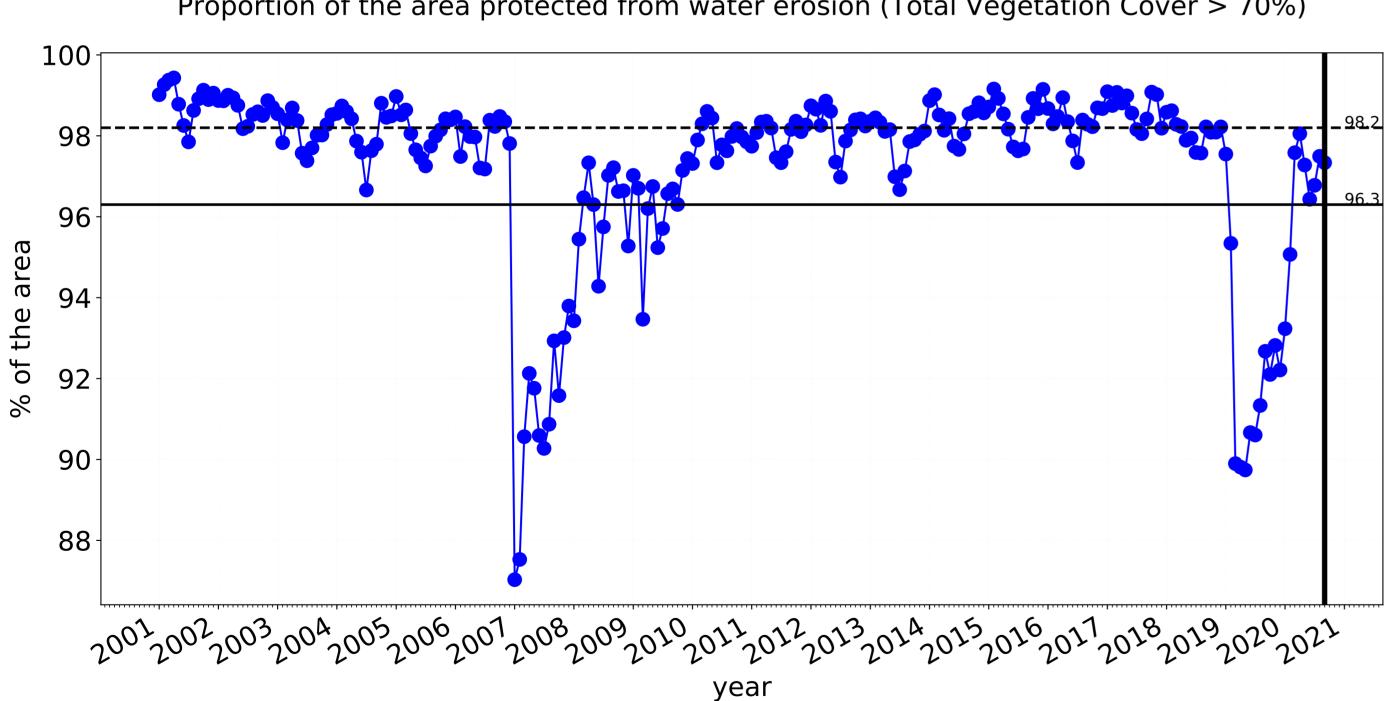








Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



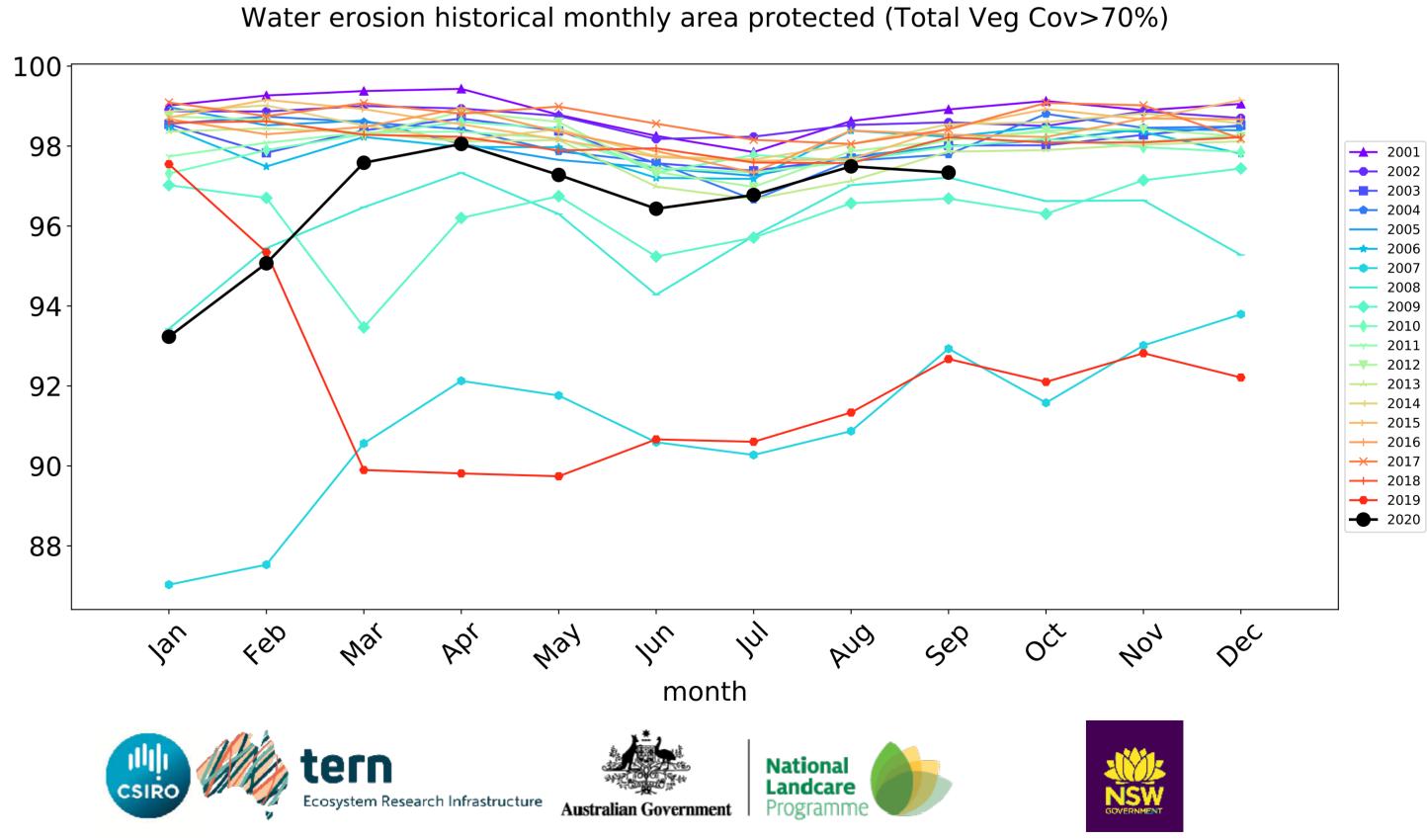
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

Conservation and natural environments timeseries

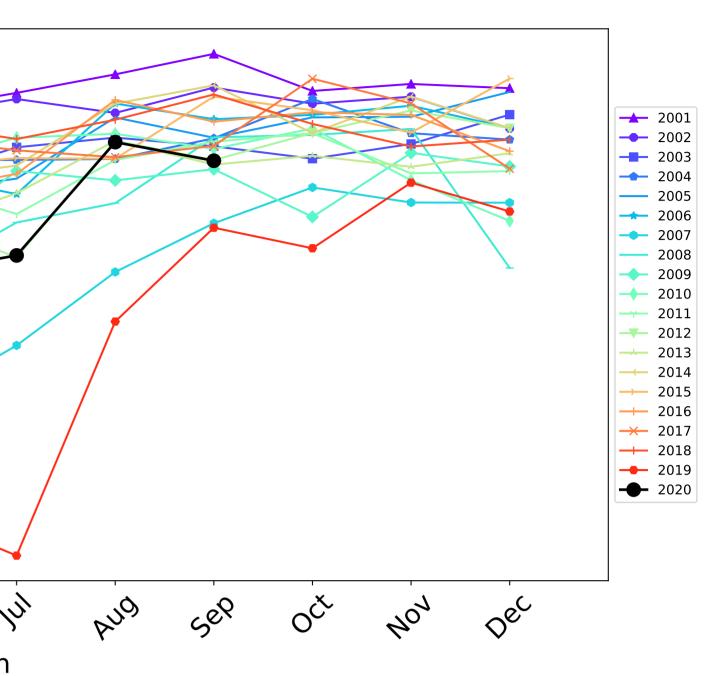
---- above_70

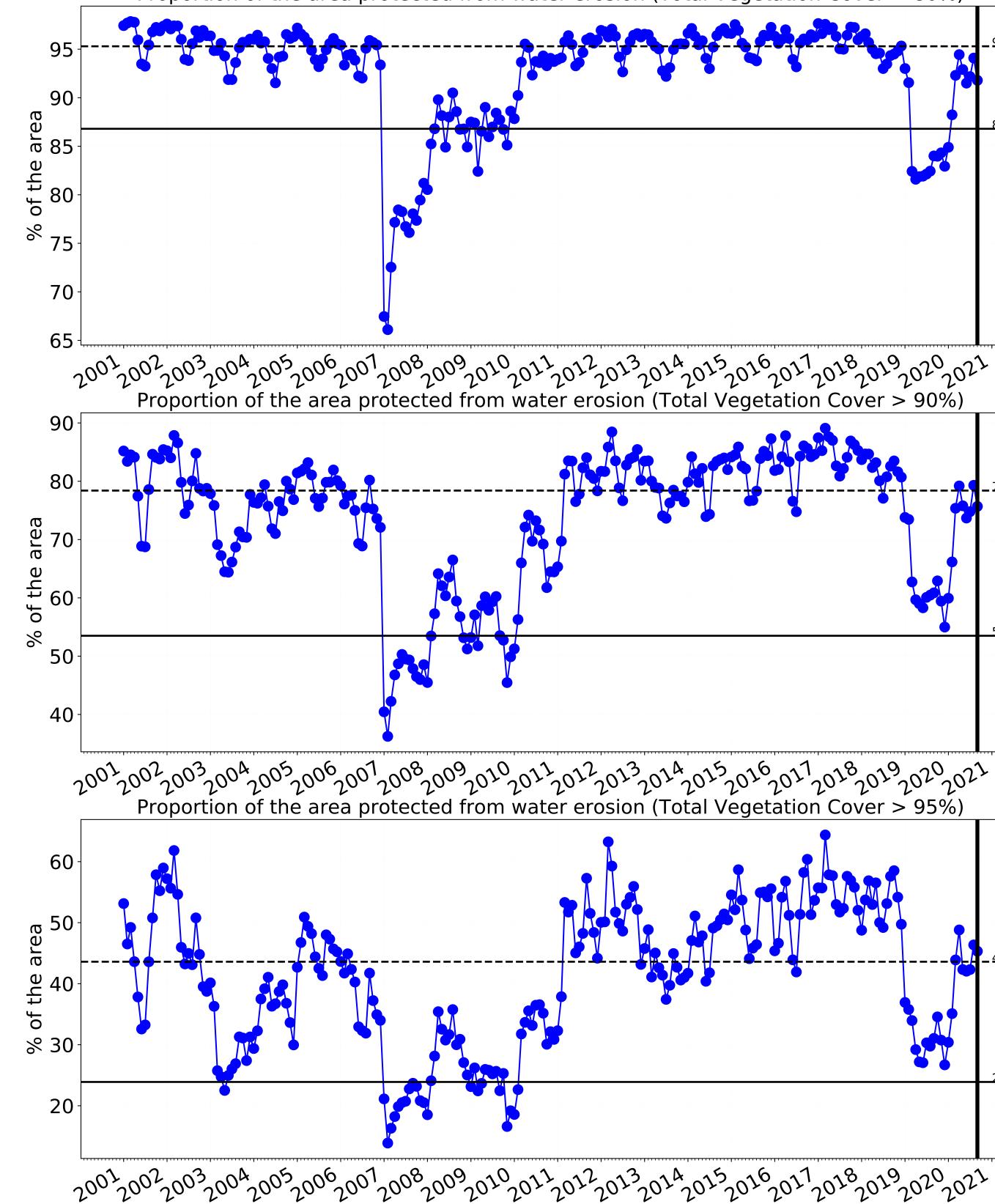
— 2020 Sep

—— 10th **——** 50th

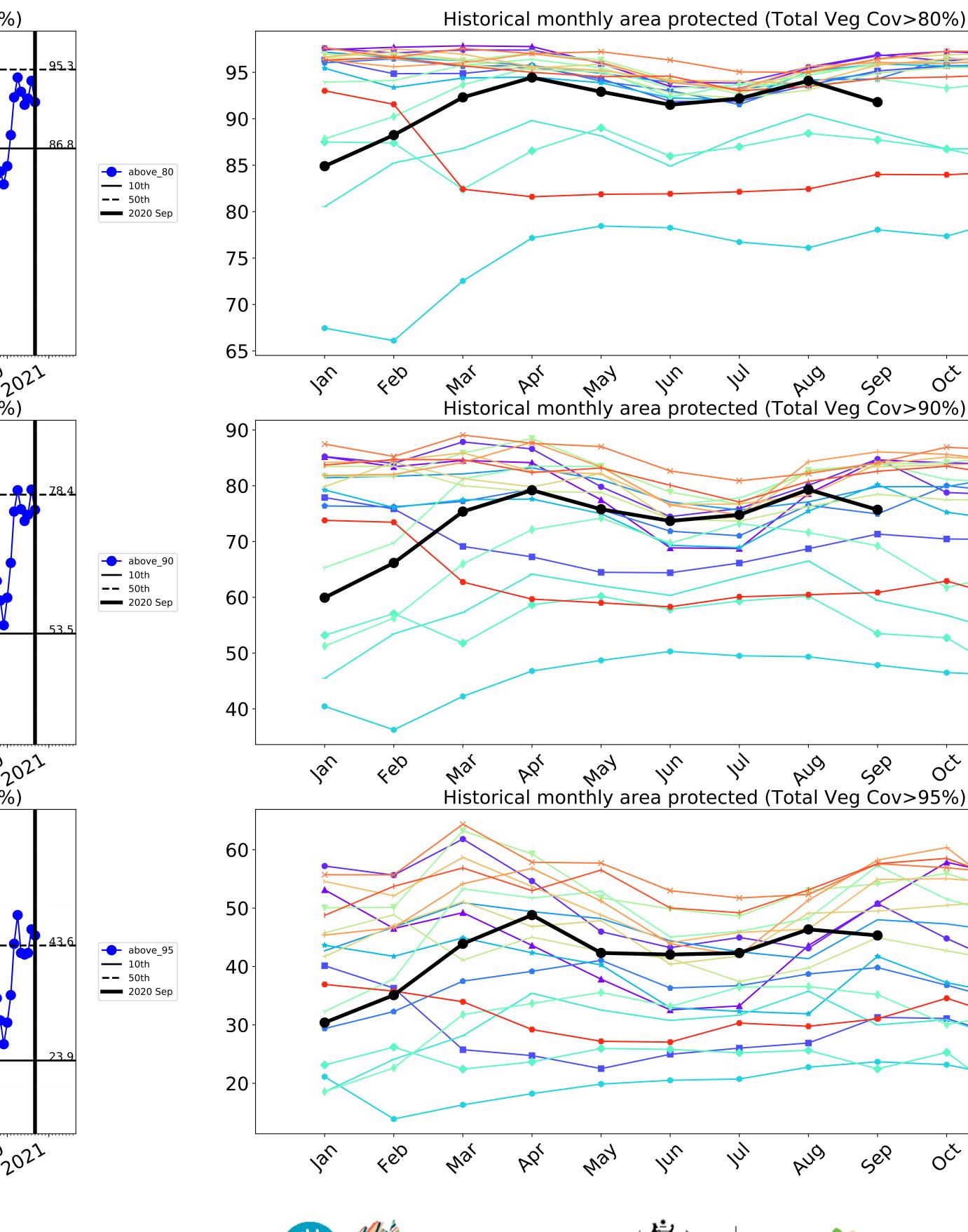


Wind erosion historical monthly area protected (Total Veg Cov >50%)



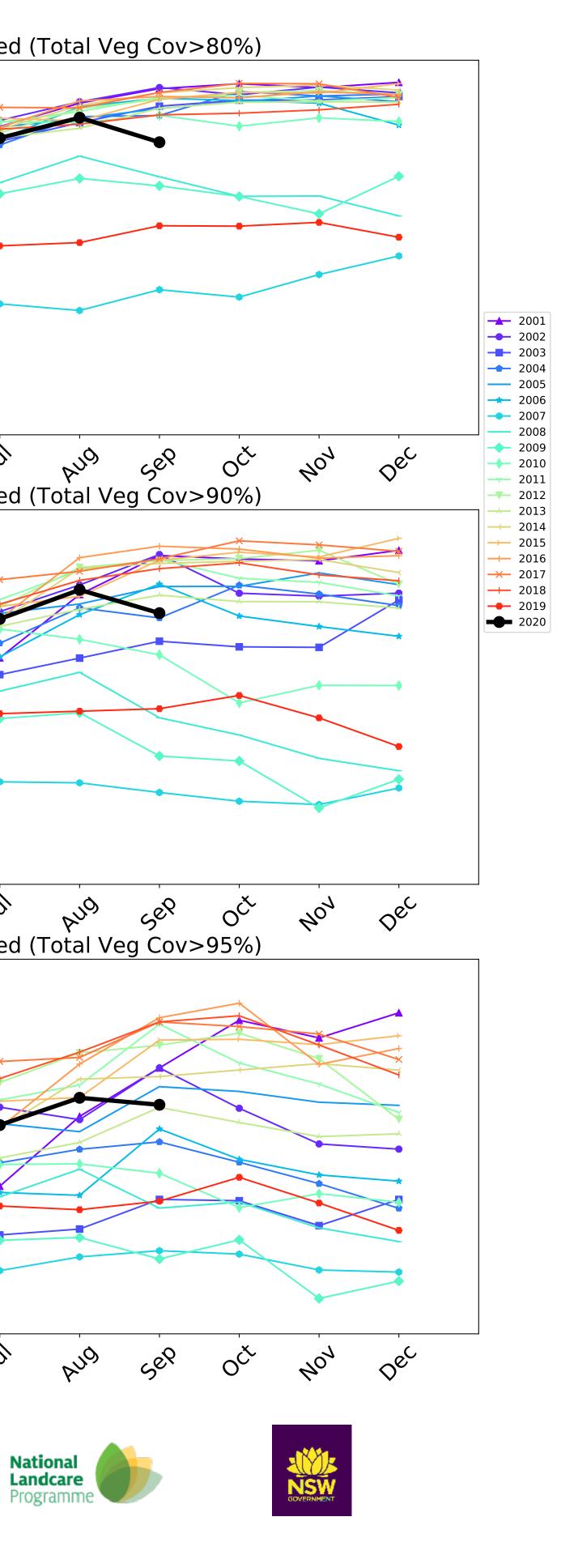


Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)

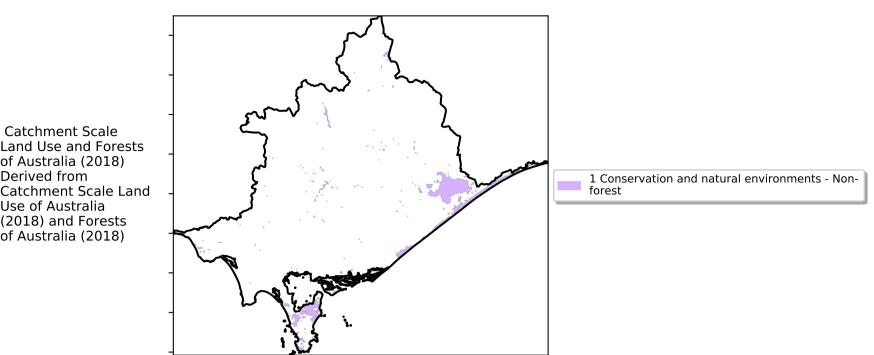




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Conservation and natural environments non forest



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

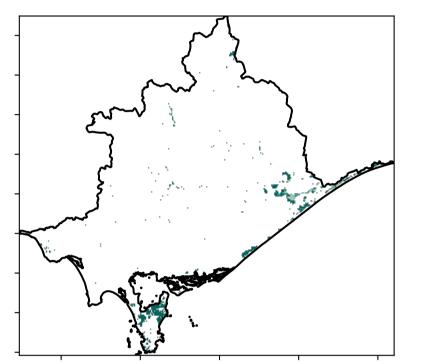
pixel is from

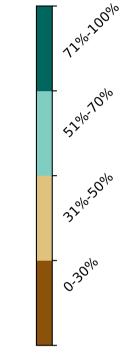
is, red pixels

mean of that

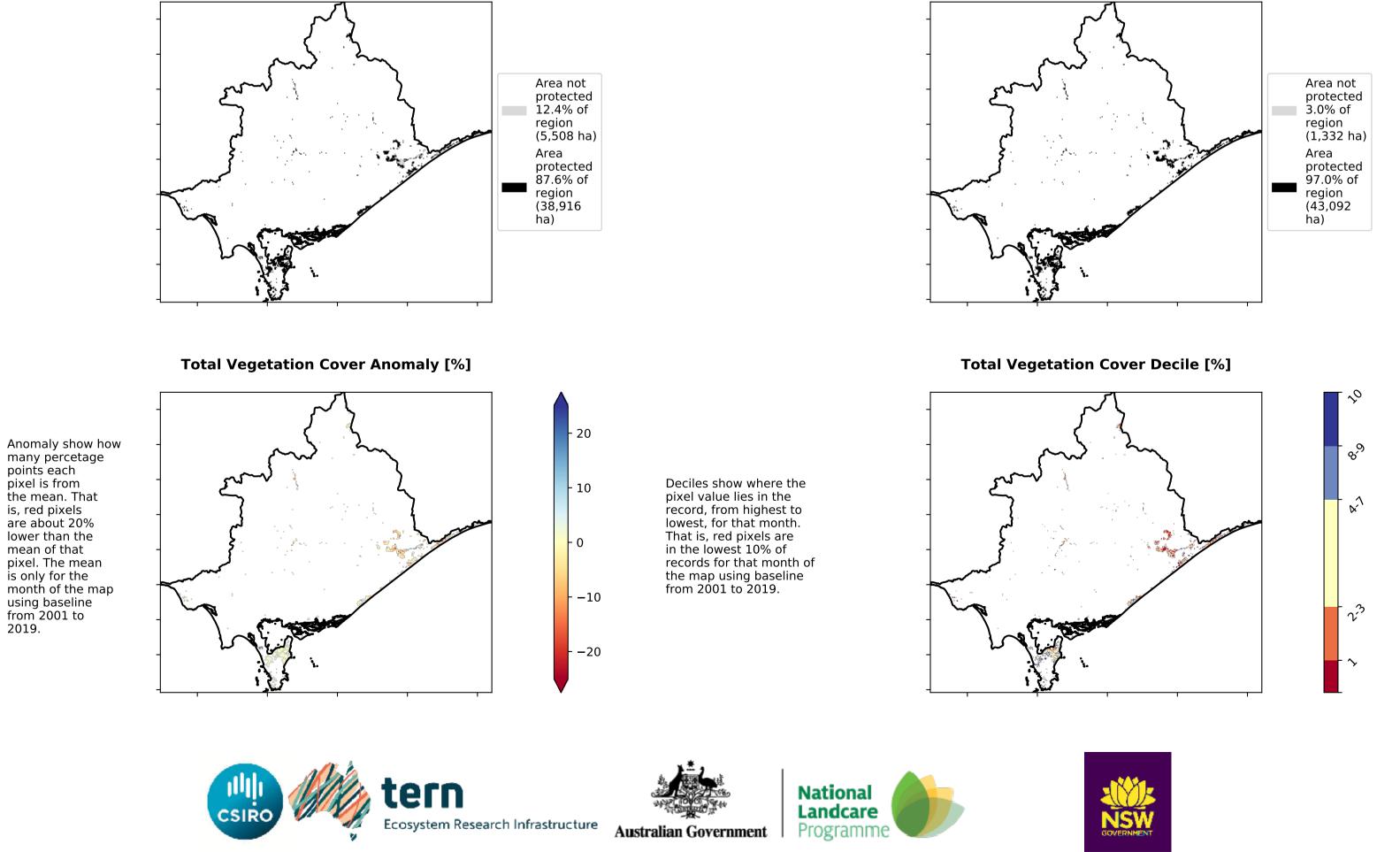
Total Vegetation Cover [%]

Land use and forest cover

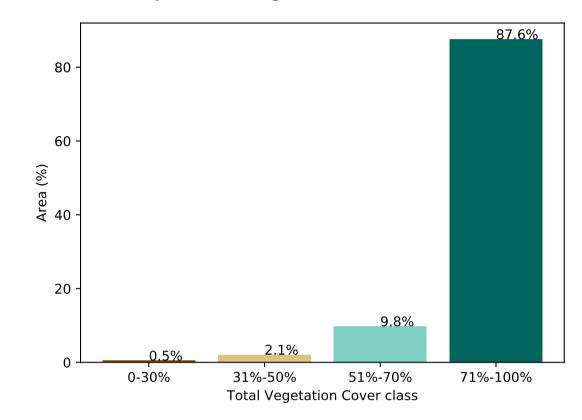




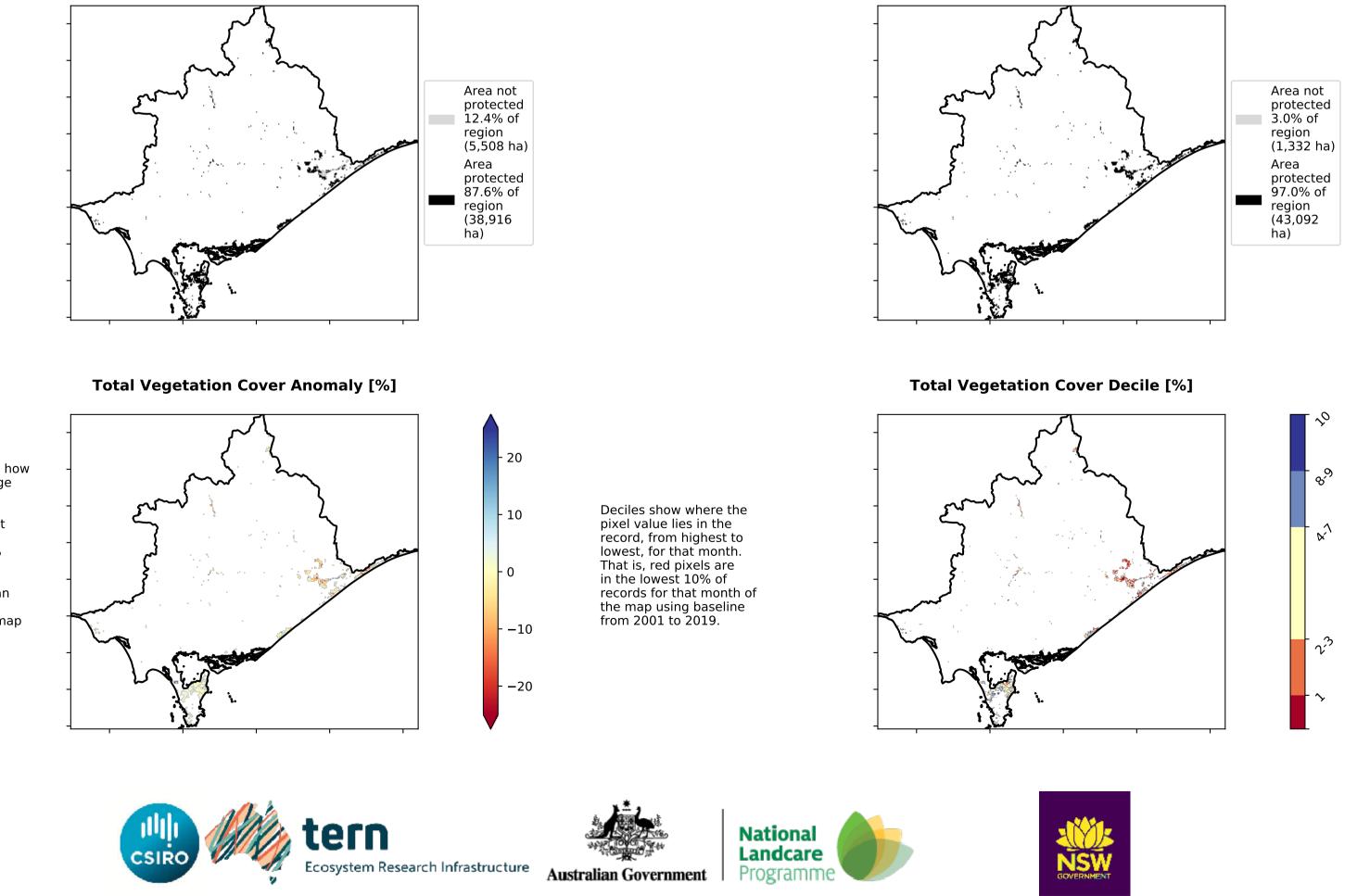
% Area protected from water erosion (>70%)

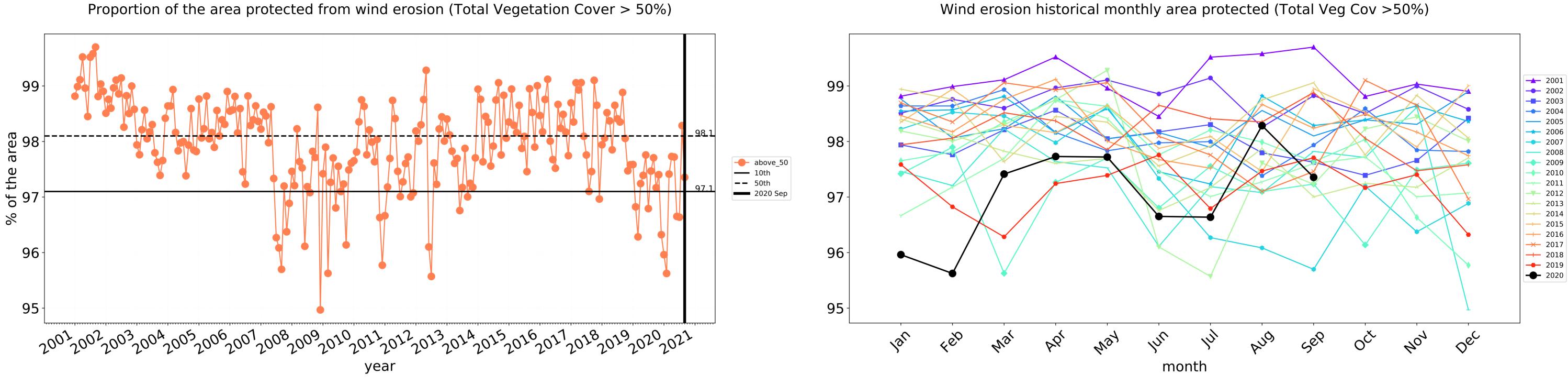






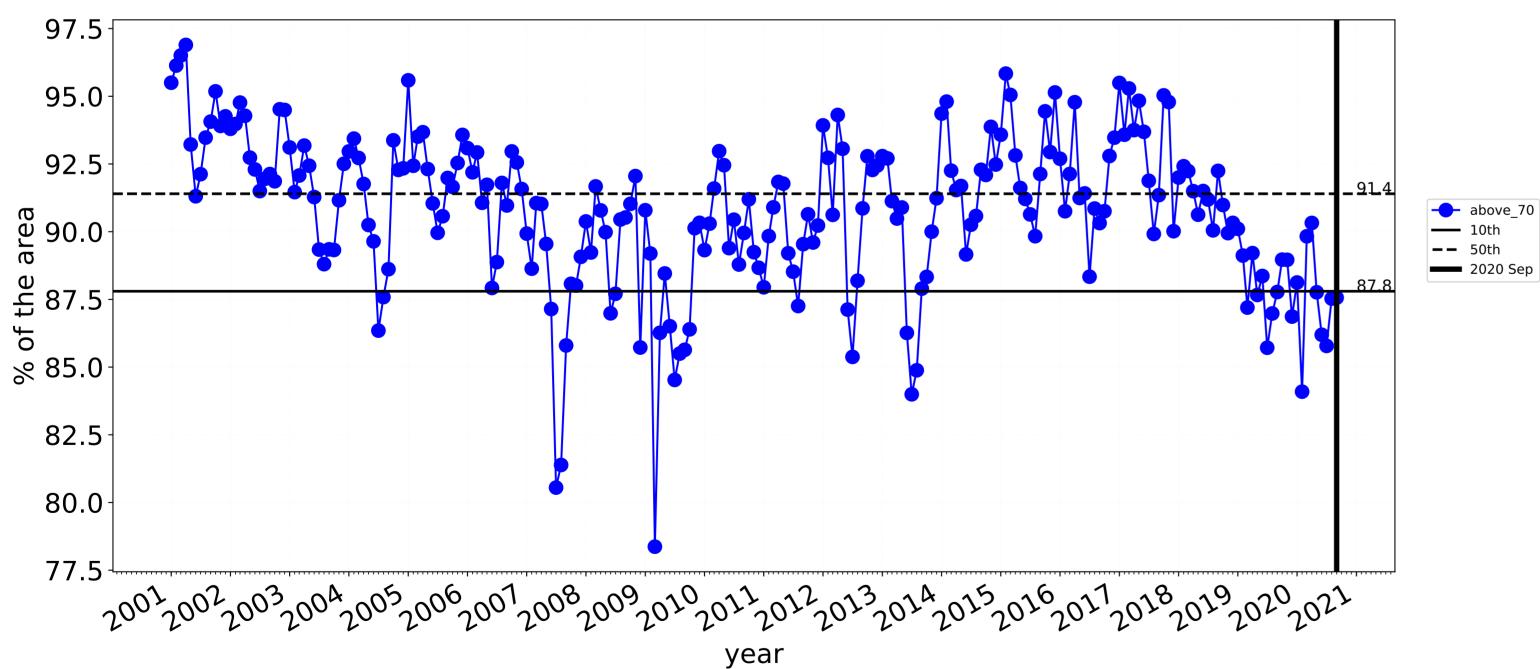
% Area protected from wind erosion (>50%)





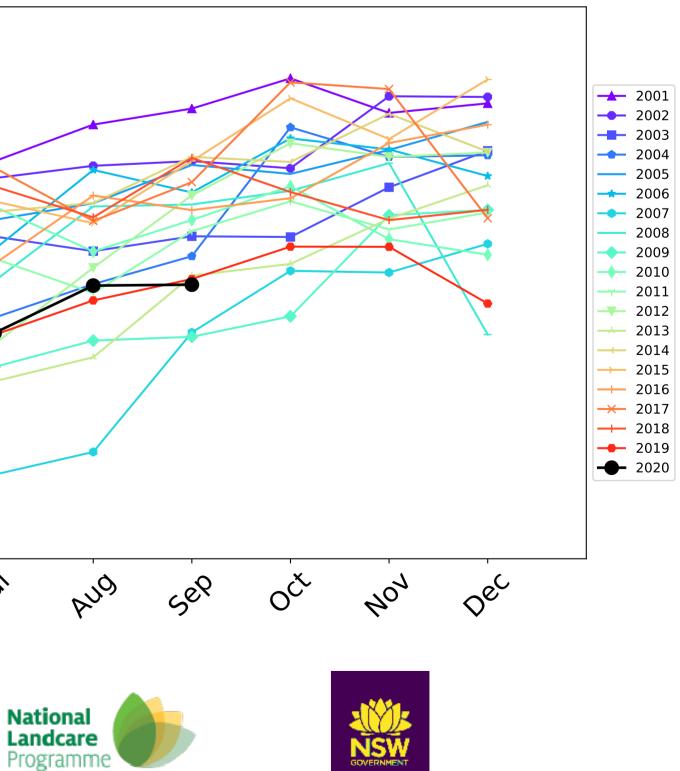
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

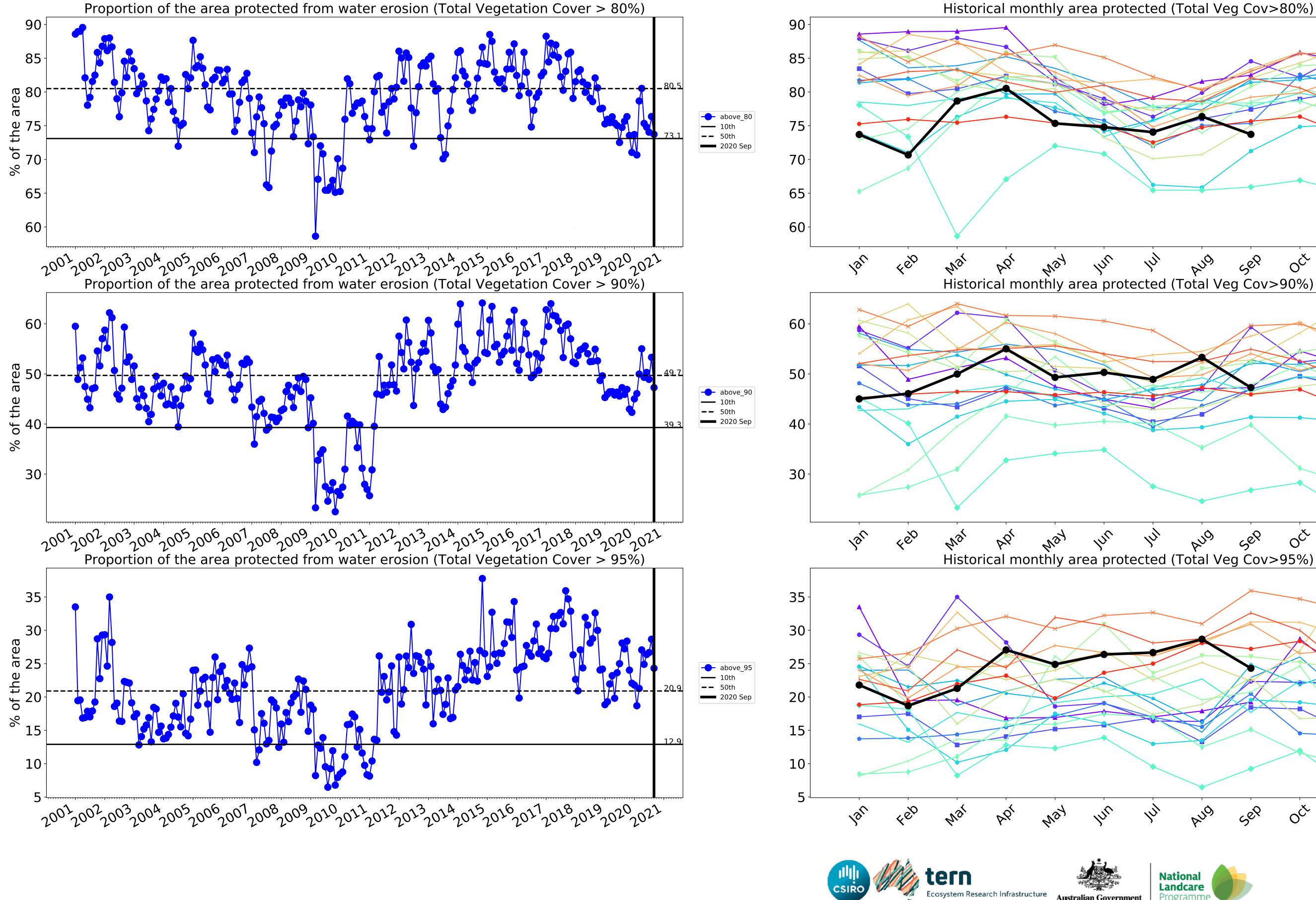




97.5⊺ 95.0 92.5 90.0 87.5 85.0 82.5 80.0 77.5-4eb Jan hur Mar May PQ (J) month 1111 tern Ecosystem Research Infrastructure Australian Government

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

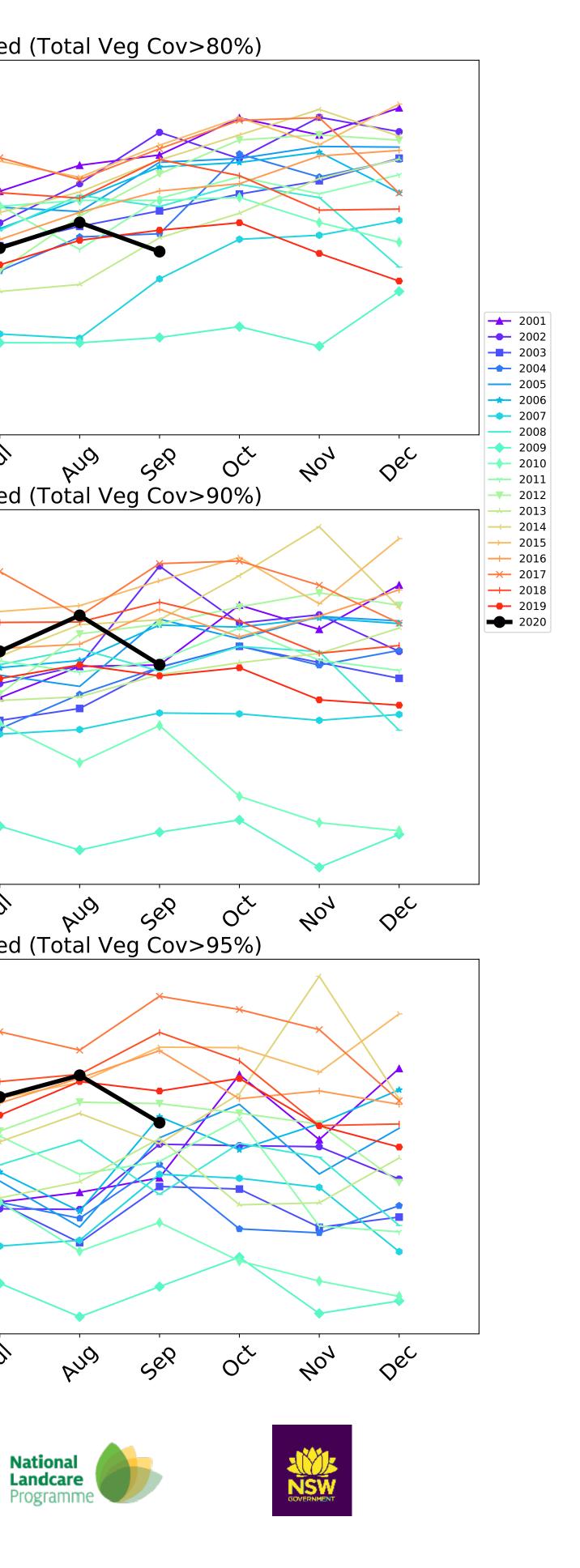




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Australian Government

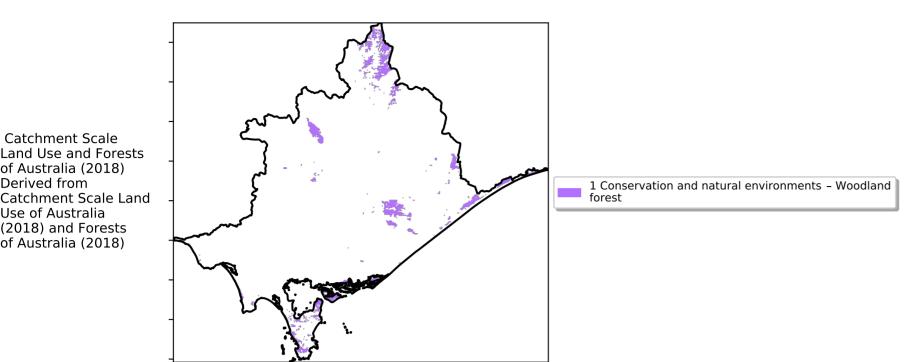
Ecosystem Research Infrastructure



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Conservation and natural environments Woodland forest



12%100%

· 520/07/00/0

320050010

0.30%

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

pixel is from

is, red pixels are about 20% lower than the

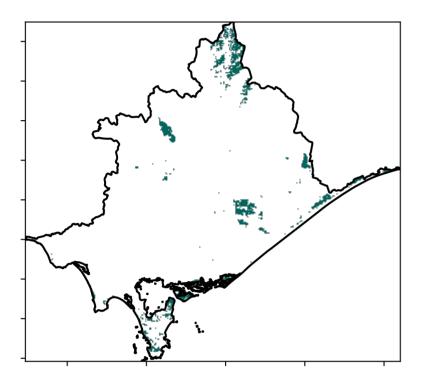
mean of that pixel. The mean

using baseline from 2001 to 2019.

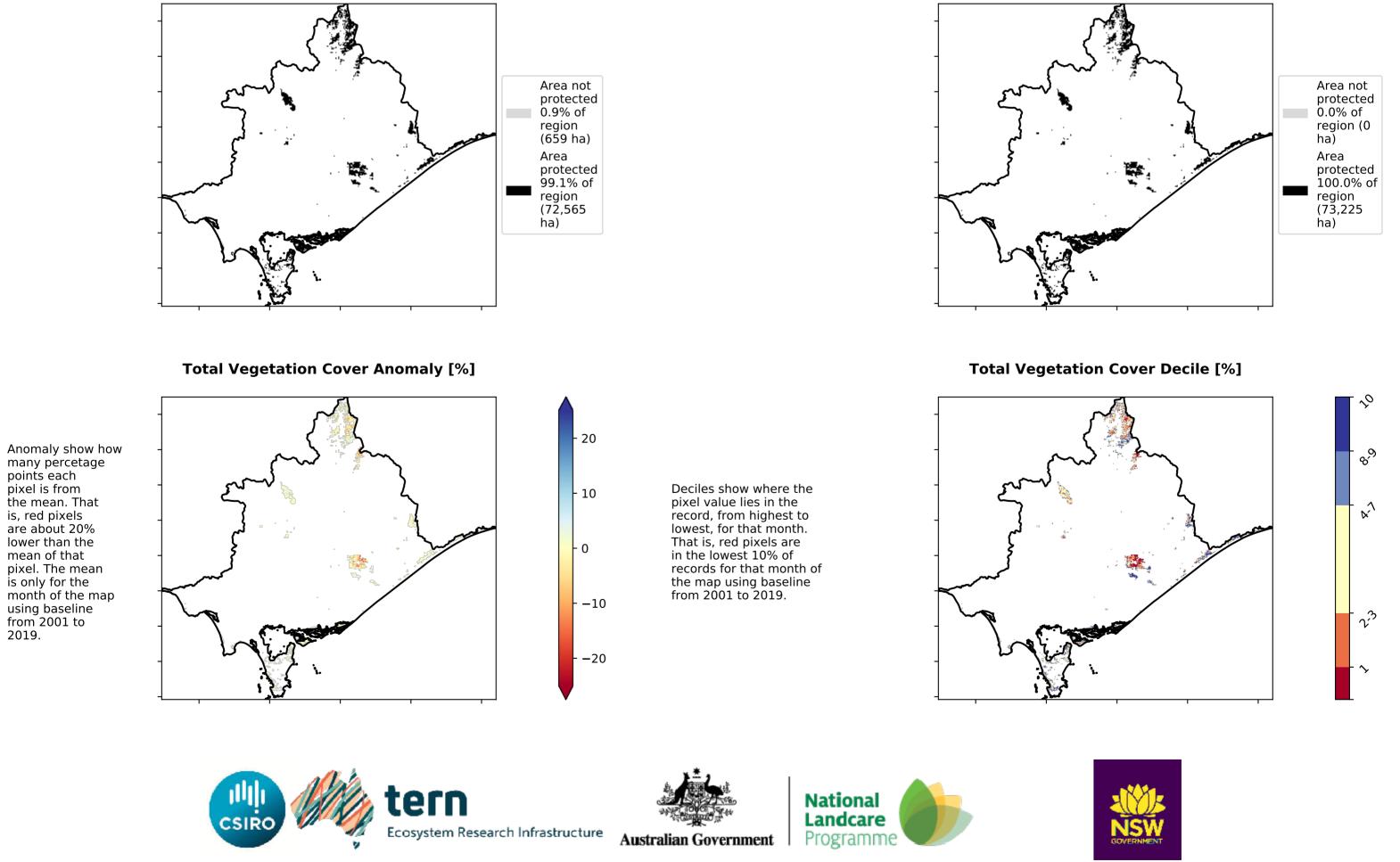
the mean. That

Total Vegetation Cover [%]

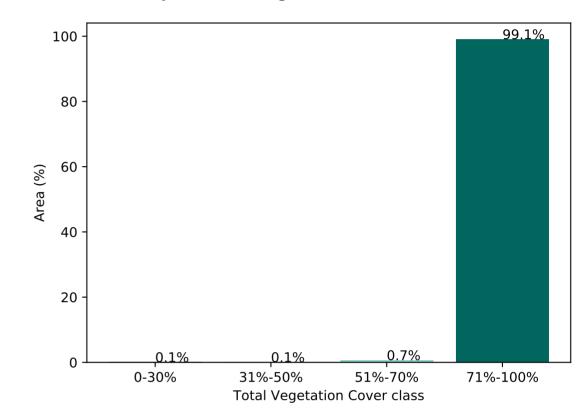
Land use and forest cover



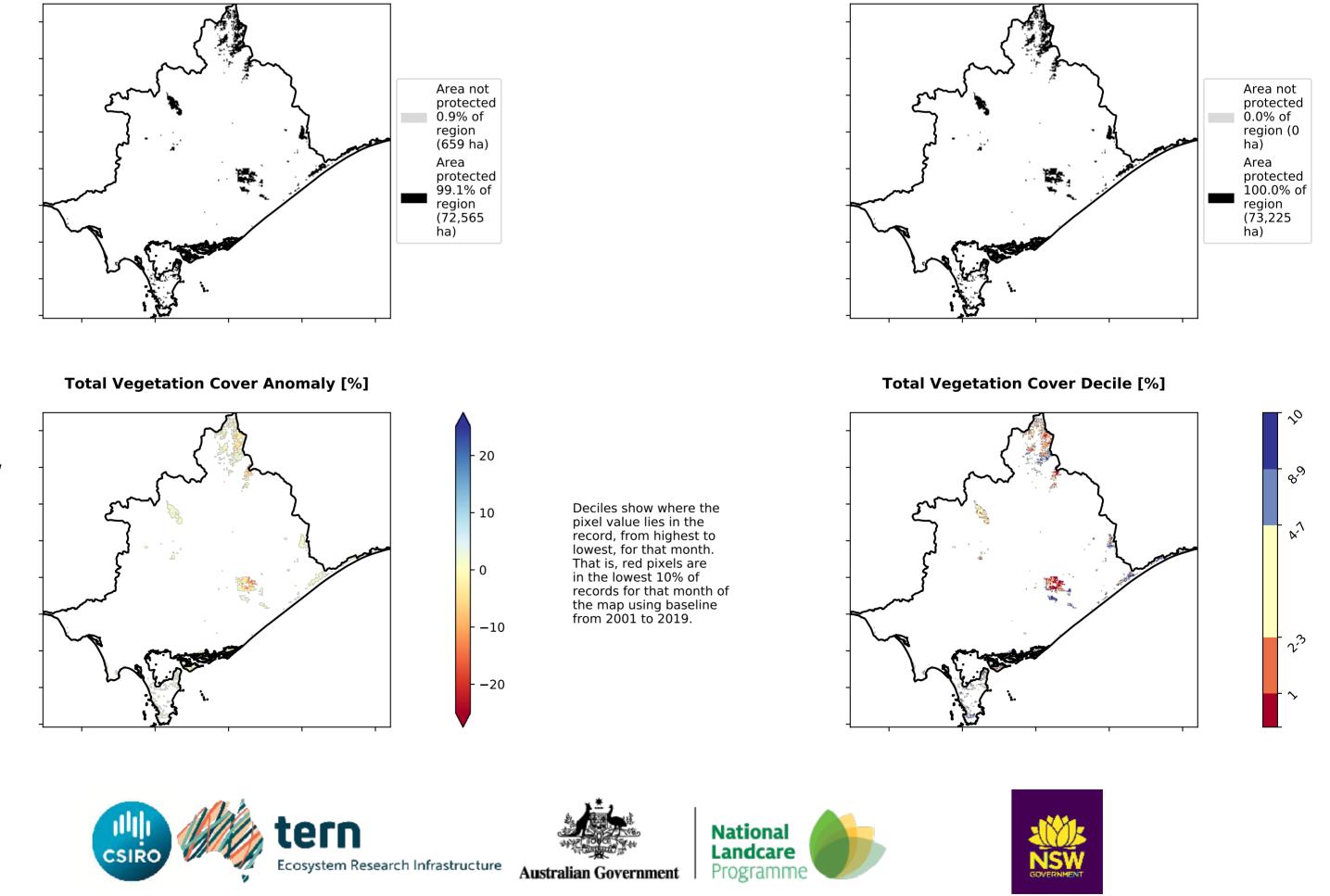
% Area protected from water erosion (>70%)

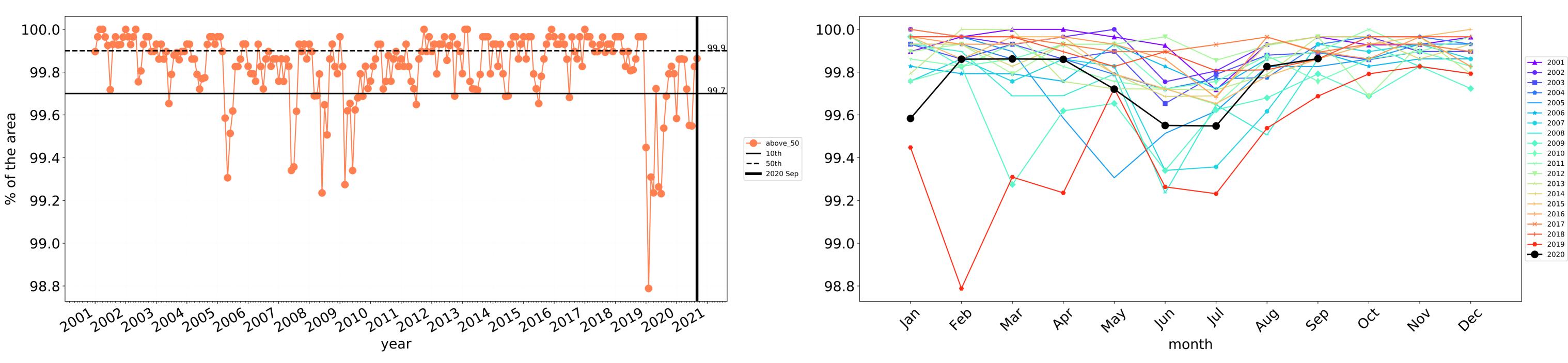






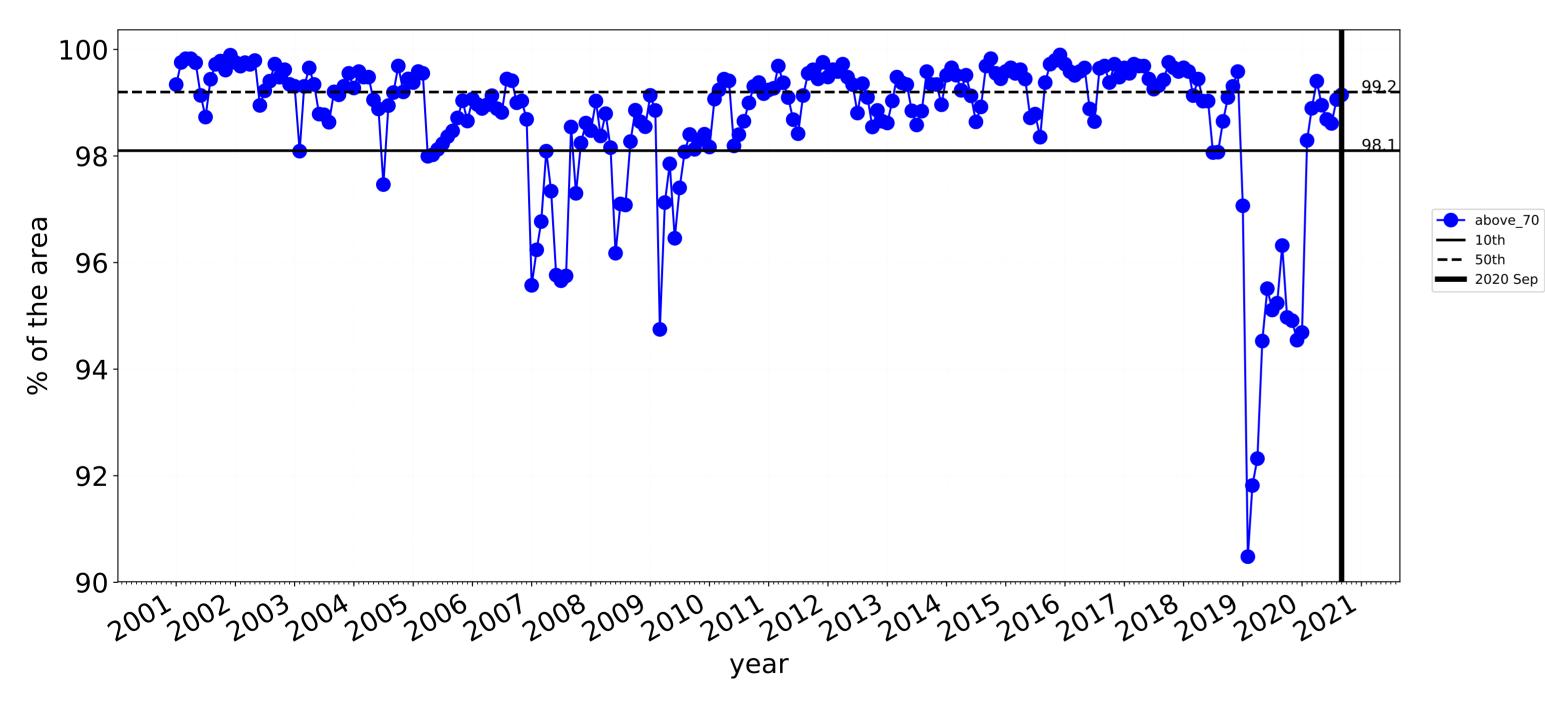
% Area protected from wind erosion (>50%)



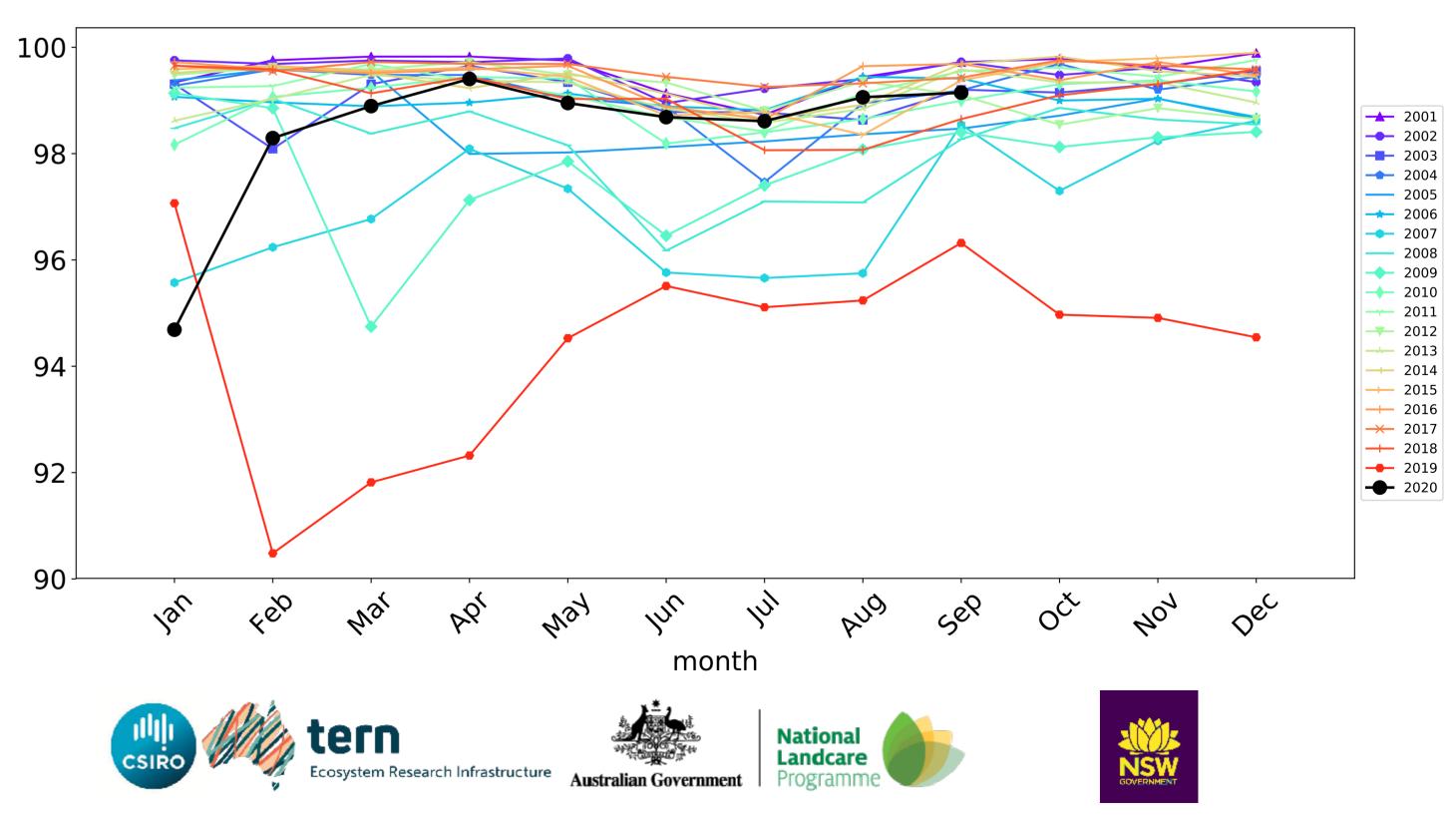


Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

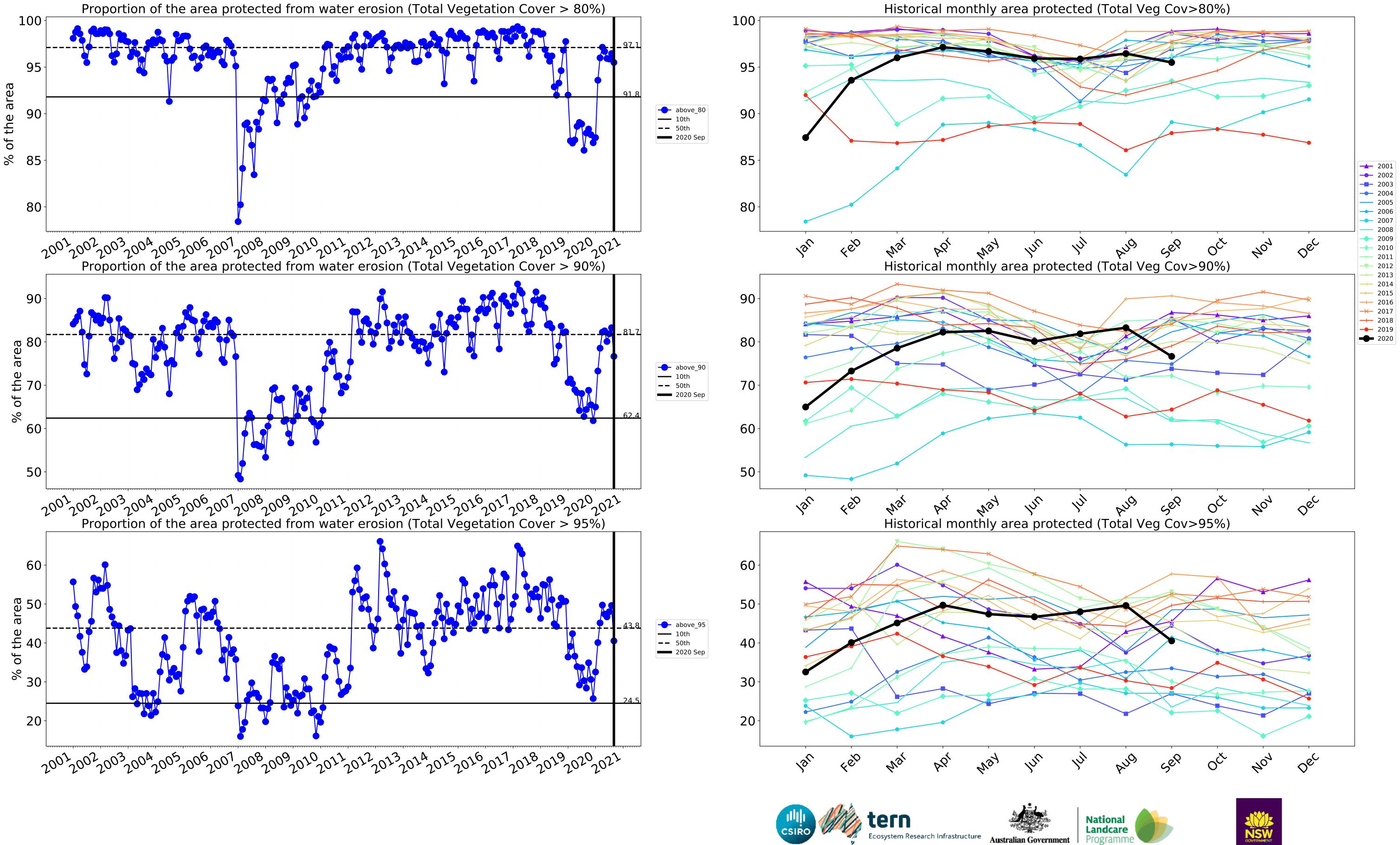
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

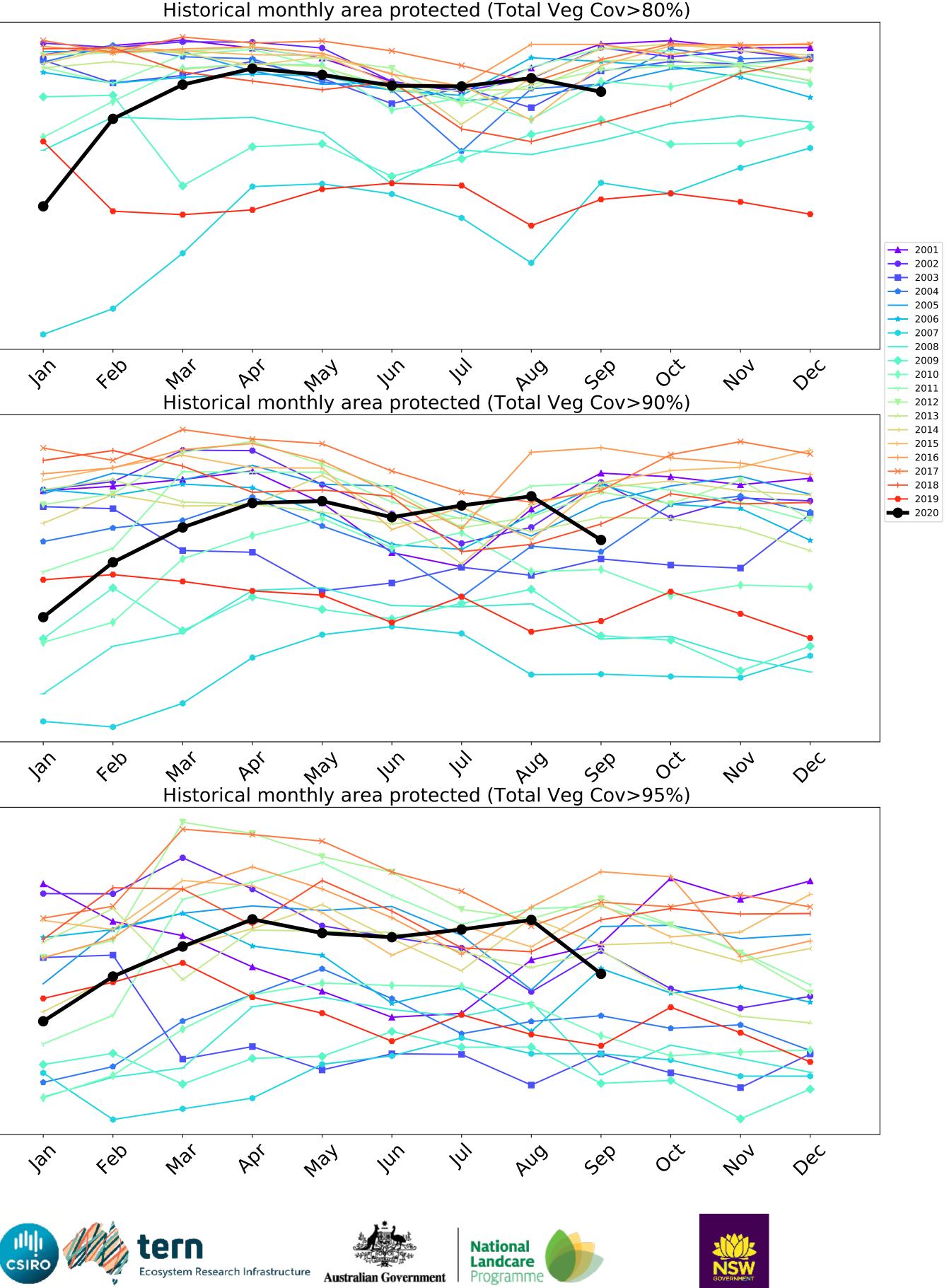


Water erosion historical monthly area protected (Total Veg Cov>70%)

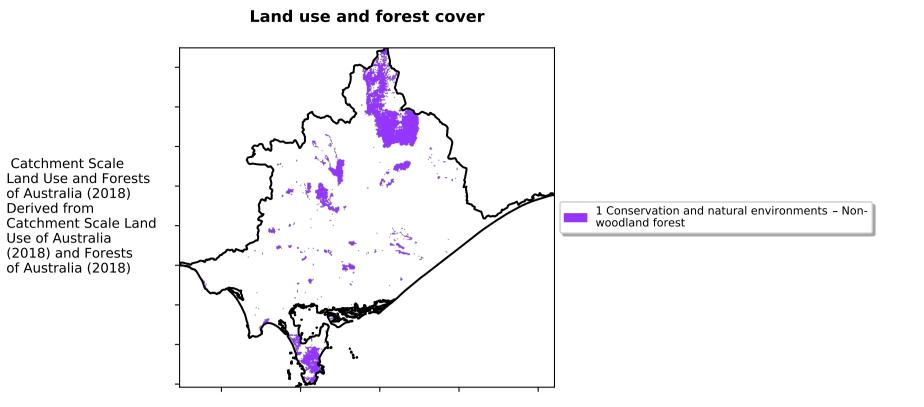


Wind erosion historical monthly area protected (Total Veg Cov >50%)

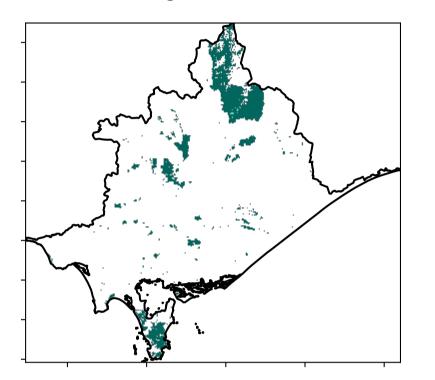




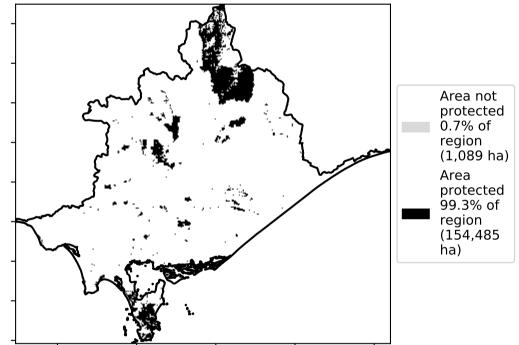
Conservation and natural environments Forest (non woodland)

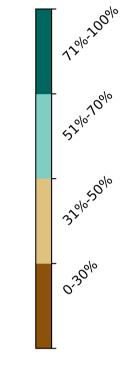


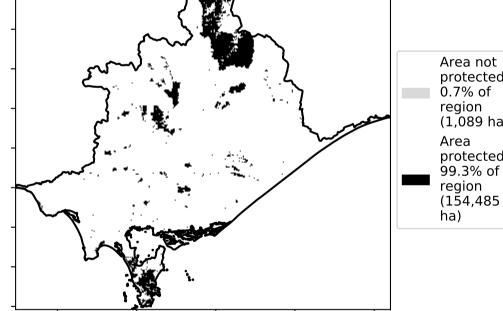
Total Vegetation Cover [%]



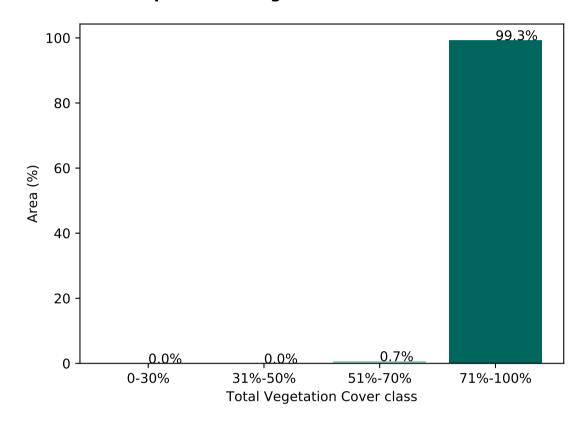
% Area protected from water erosion (>70%)



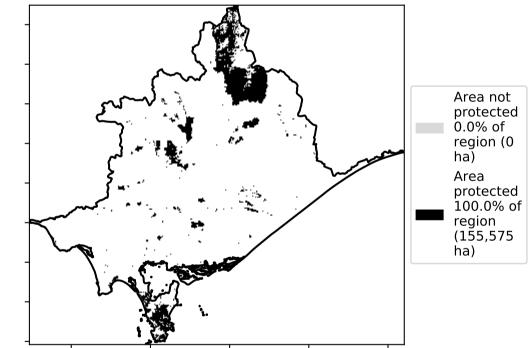




Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



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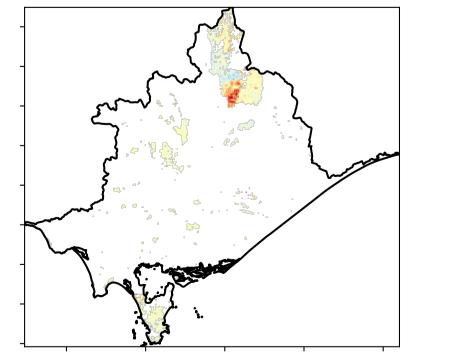
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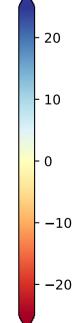
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Total Vegetation Cover Anomaly [%]

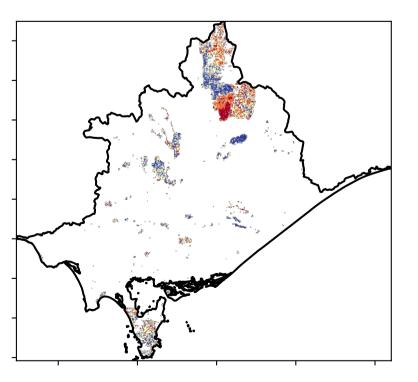
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.





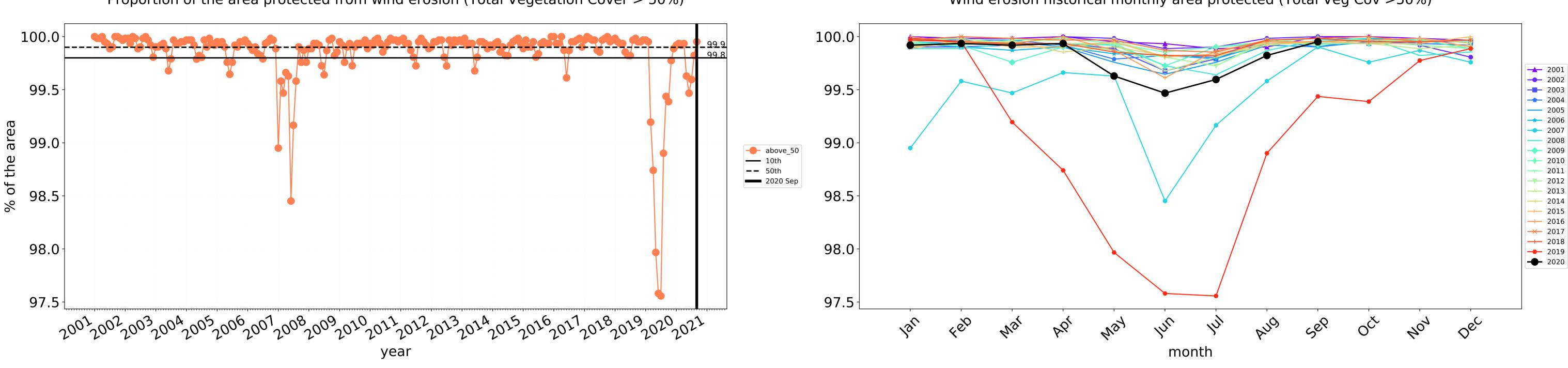
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



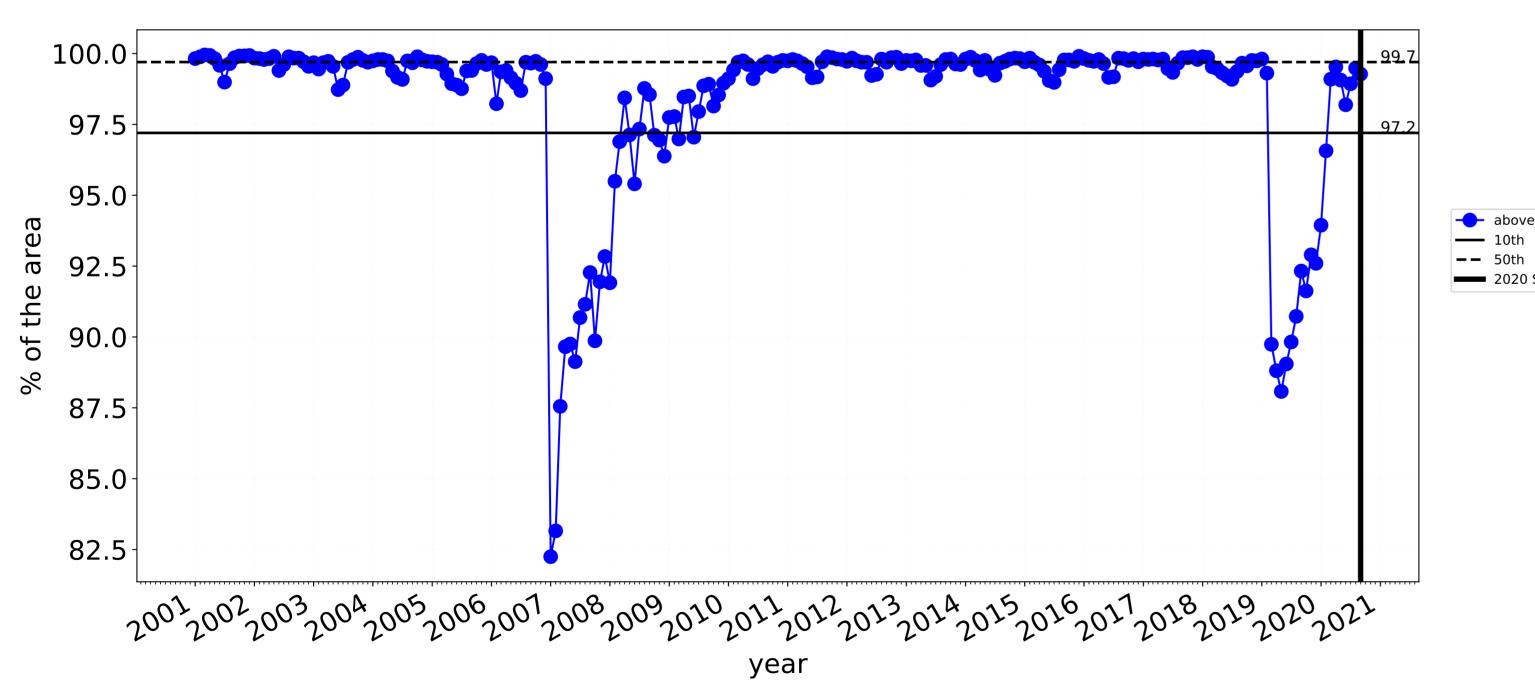


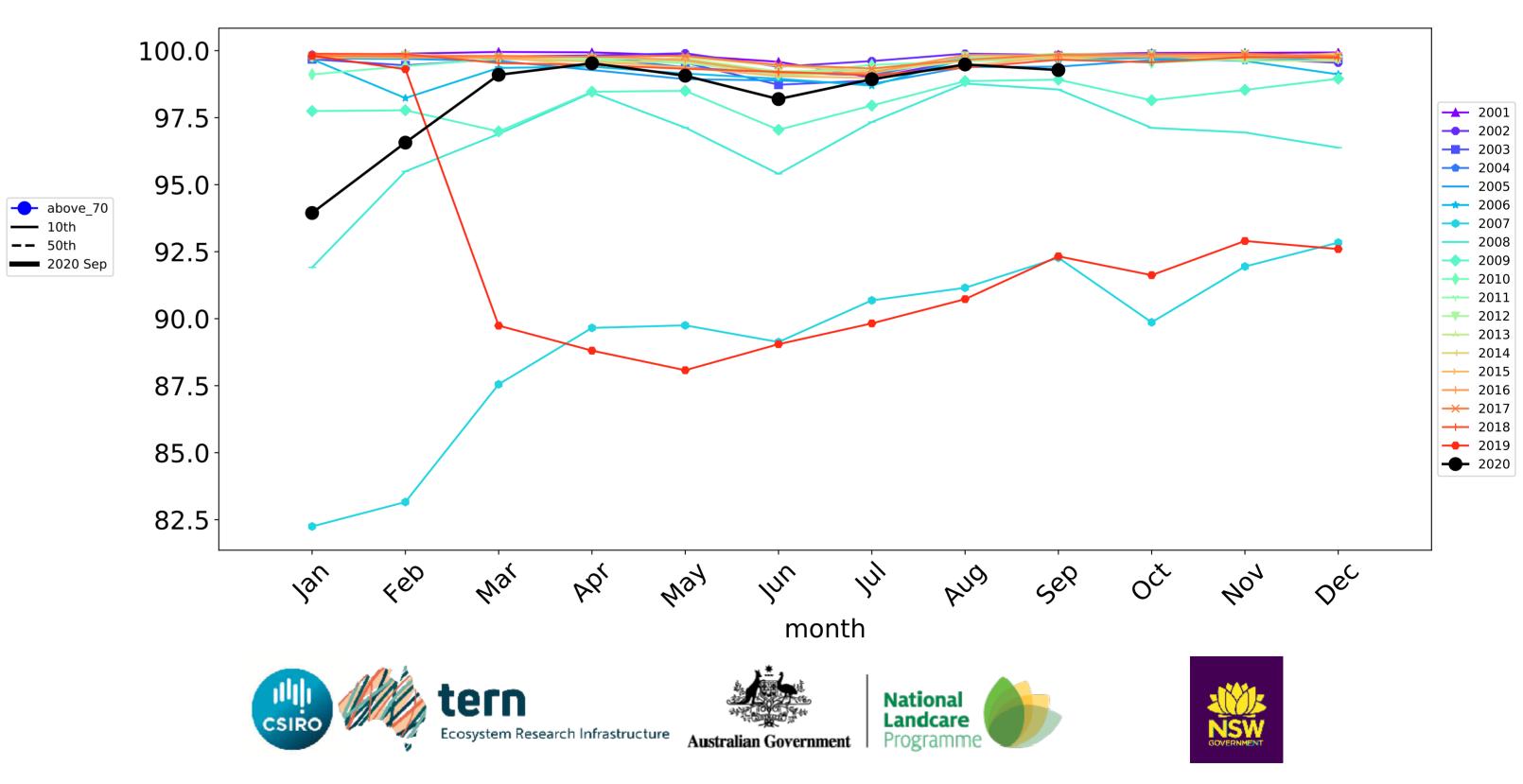
Conservation and natural environments Forest (non woodland) timeseries



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

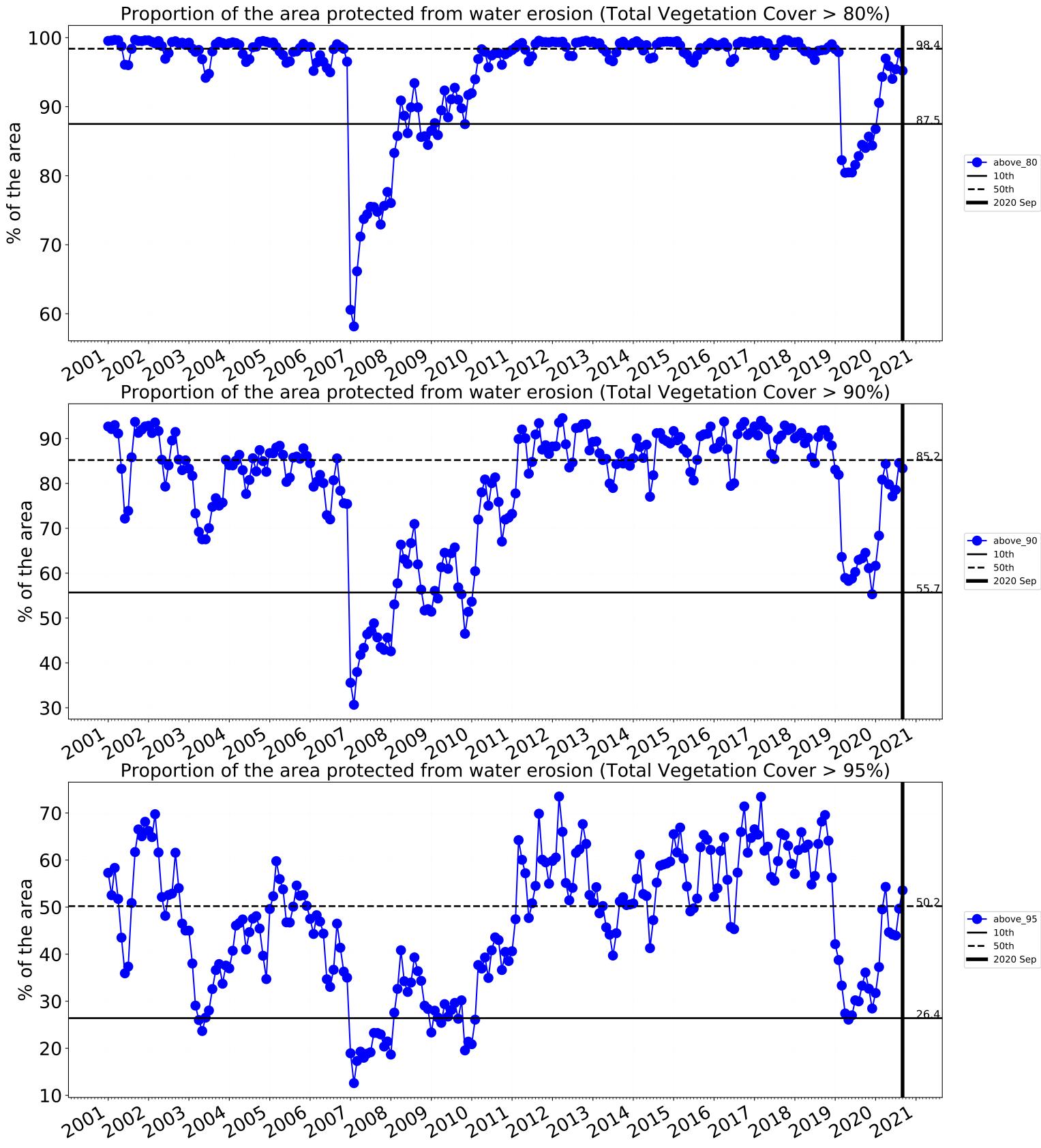
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

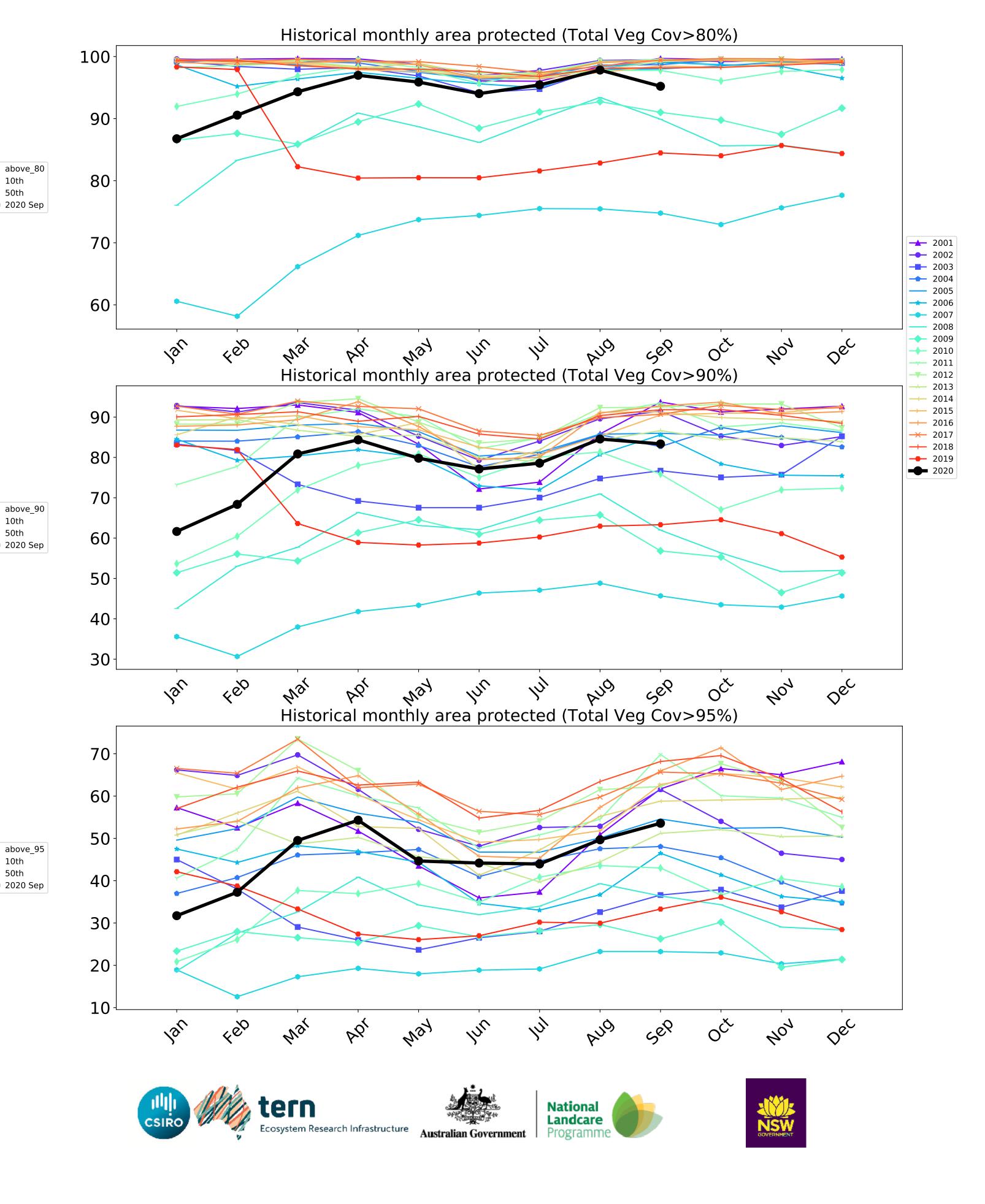




Wind erosion historical monthly area protected (Total Veg Cov >50%)

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



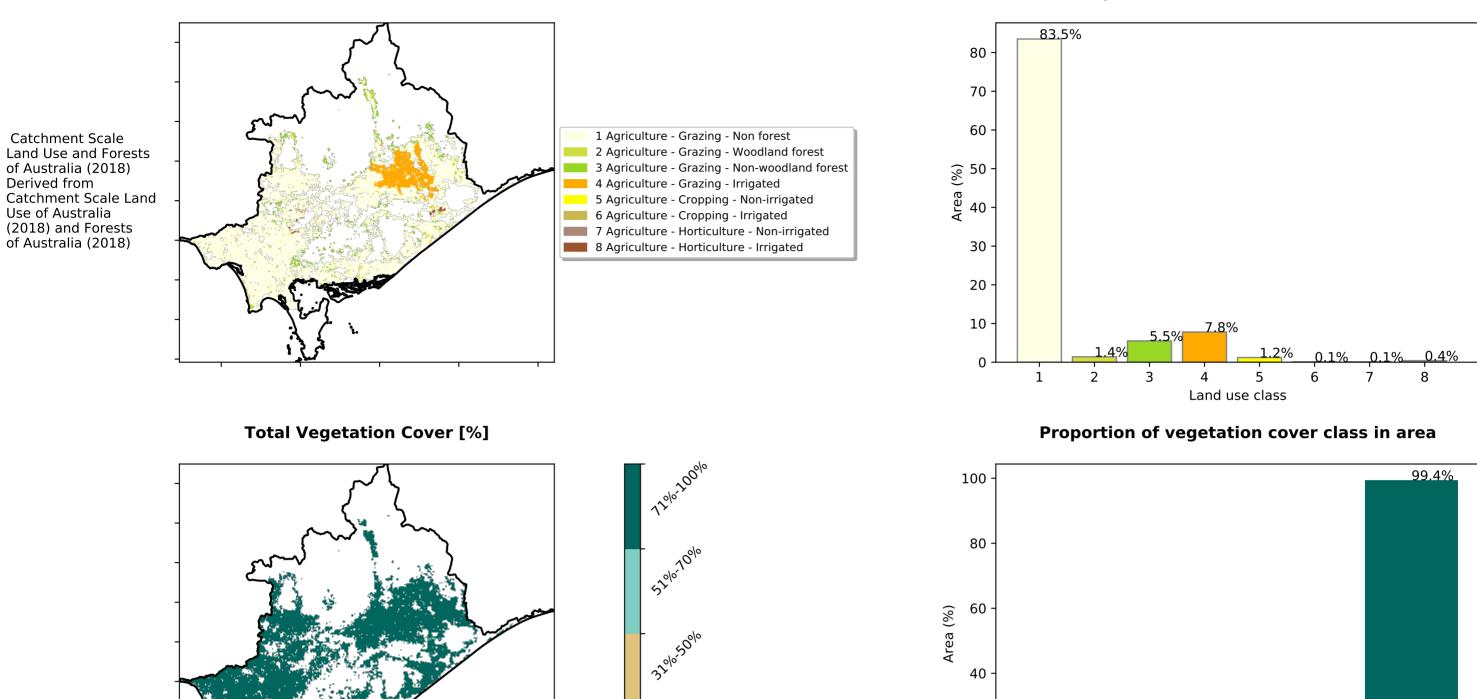


6

Agriculture

Land use and forest cover

Proportion of each land class in area



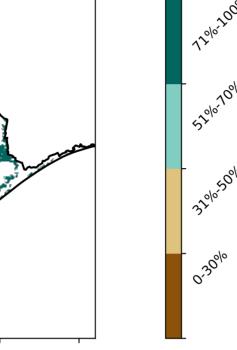
20

0

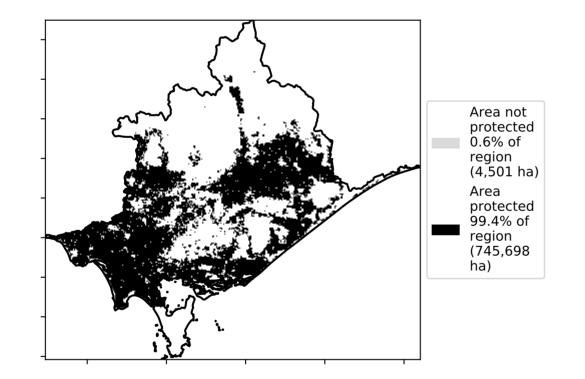
0.0%

0-30%

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



% Area protected from water erosion (>70%)

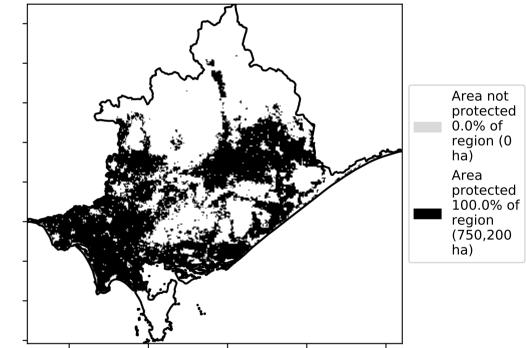


% Area protected from wind erosion (>50%)

Total Vegetation Cover class

0.0%

31%-50%



0.6%

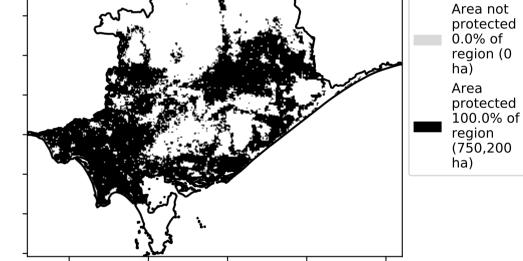
71%-100%

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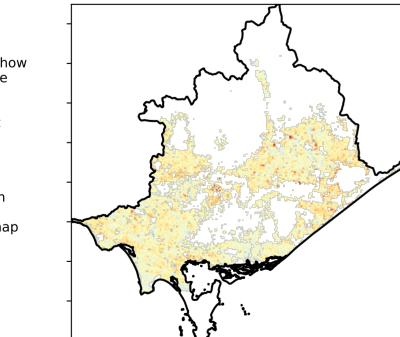
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· 2.3

51%-70%



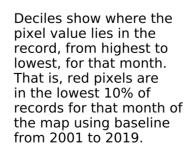
Total Vegetation Cover Anomaly [%]



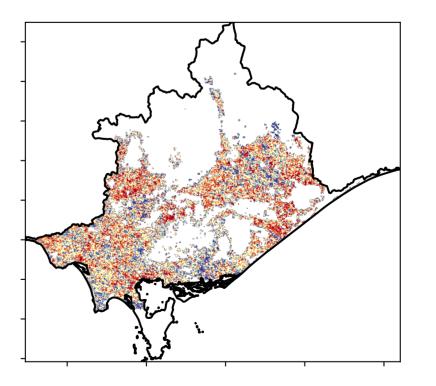
- 10 - 0 -10

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- 20



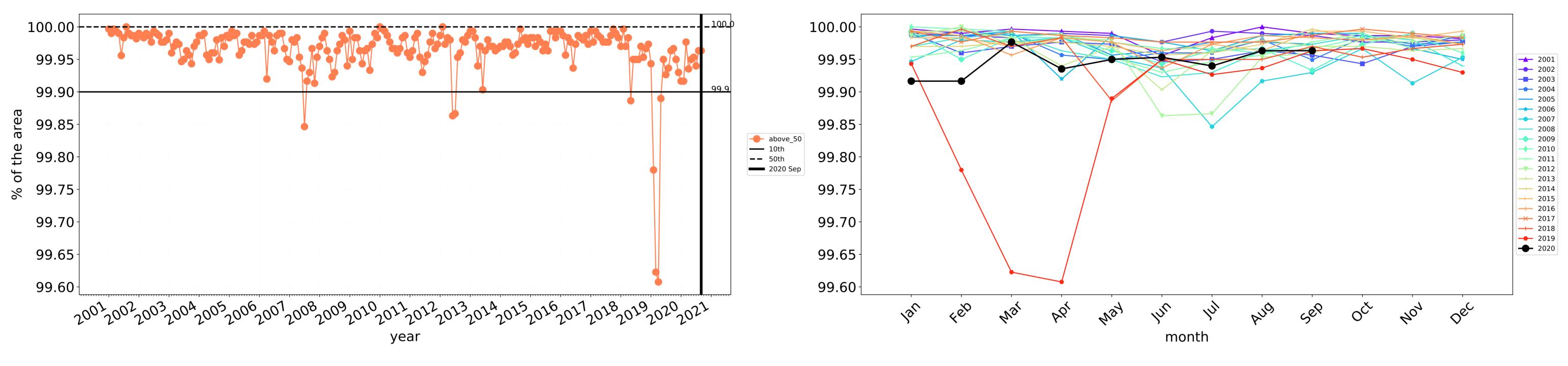
Total Vegetation Cover Decile [%]





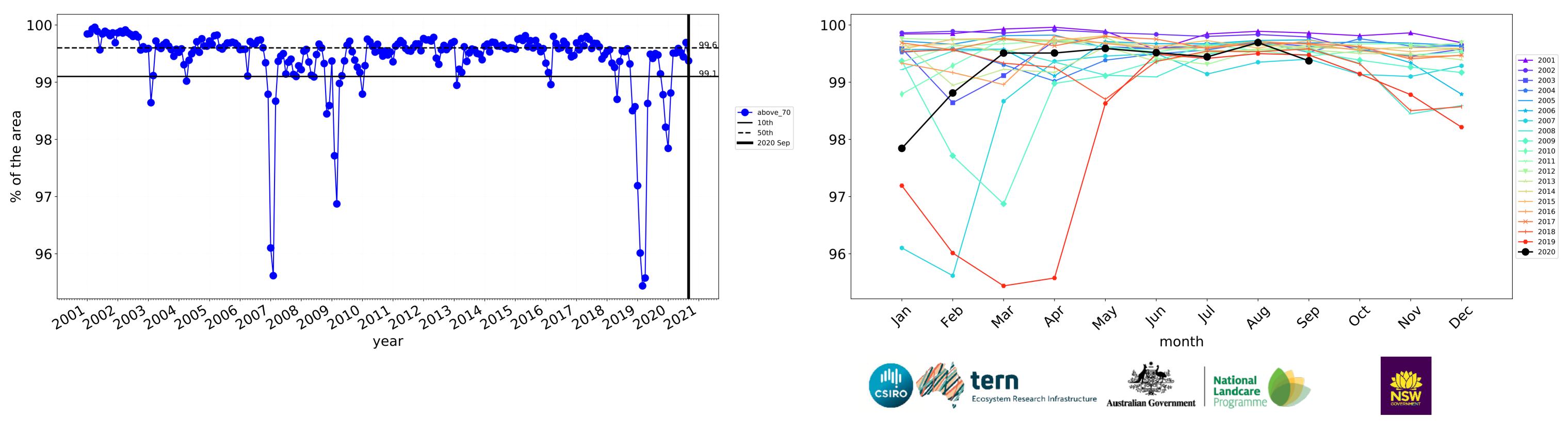
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map from 2001 to 2019.





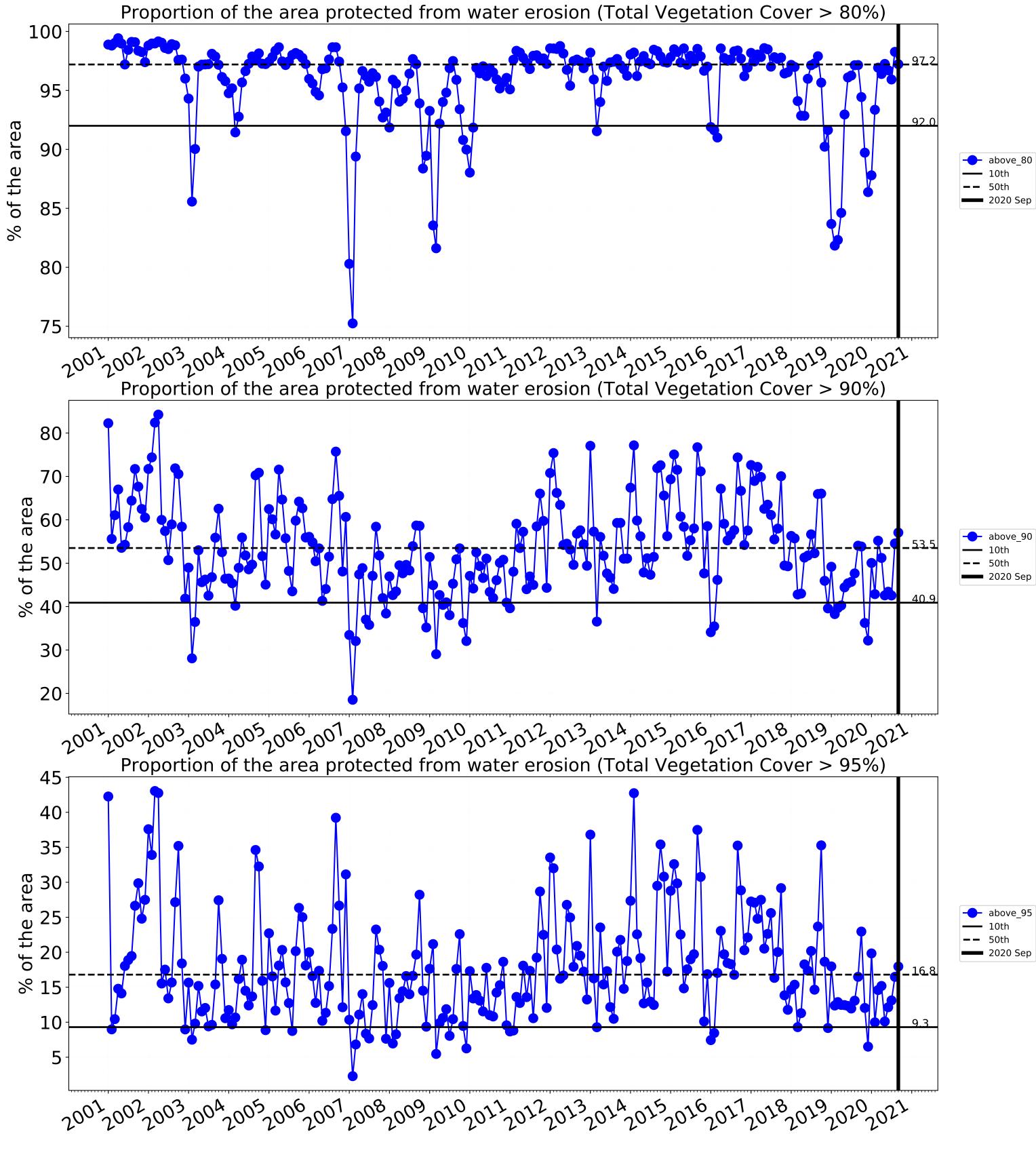
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

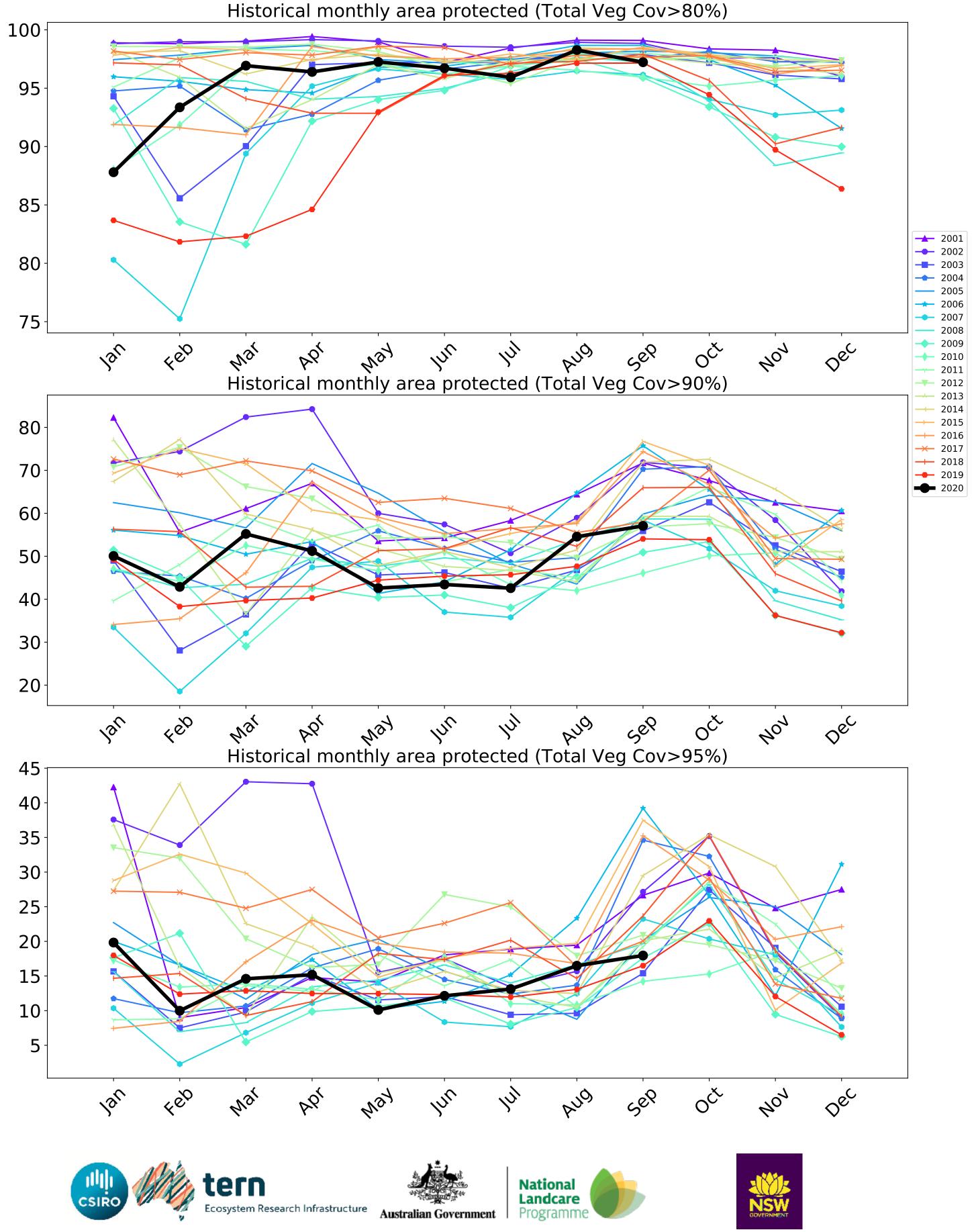
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

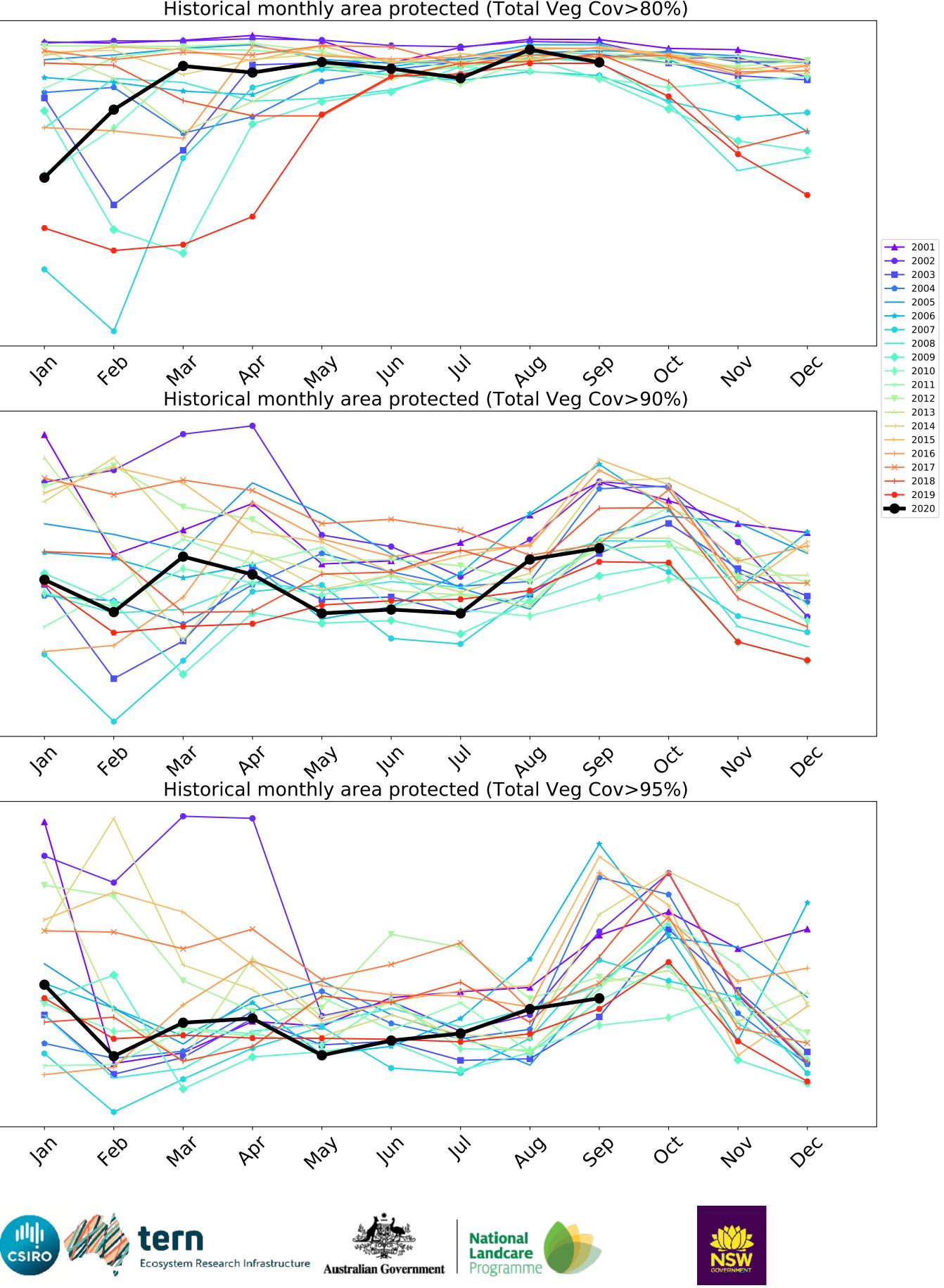


Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

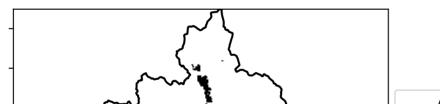




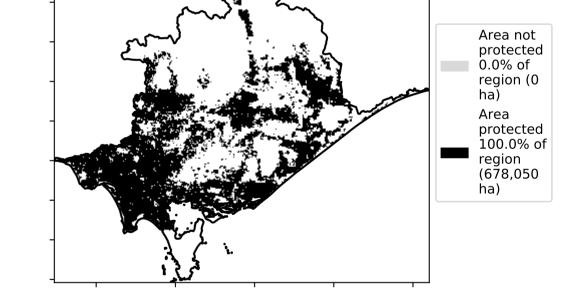


Grazing

92.4% 80 · Catchment Scale Land Use and Forests of Australia (2018) 60 Area (%) 1 Agriculture - Grazing - Non forest Derived from 2 Agriculture - Grazing - Woodland forest Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 3 Agriculture - Grazing - Non-woodland forest 40 20 6.1% 1.6% 0 2 1 3 Land use class **Total Vegetation Cover [%]** Proportion of vegetation cover class in area 12%200% 99.4% 100 80 52°10°10°10 Area (%) 60 320050010 40 0.30% 20 0.6% 0.0% 0.0% 0 0-30% 31%-50% 51%-70% 71%-100% Total Vegetation Cover class % Area protected from water erosion (>70%) % Area protected from wind erosion (>50%)



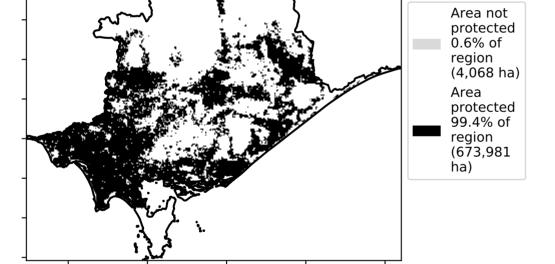
Land use and forest cover



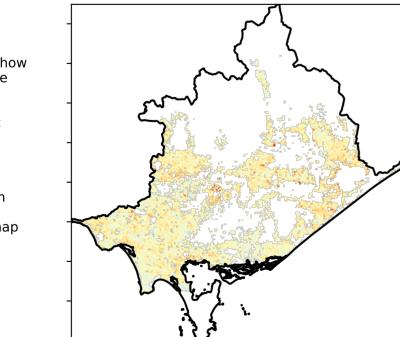
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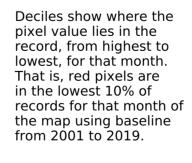
Total Vegetation Cover Anomaly [%]



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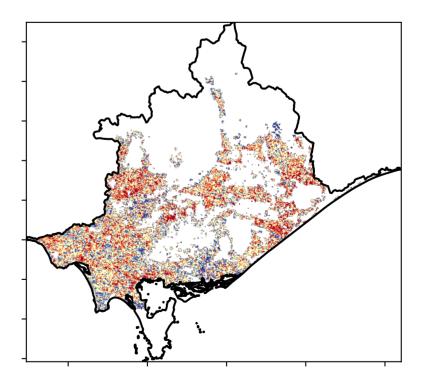
-20

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Total Vegetation Cover Decile [%]

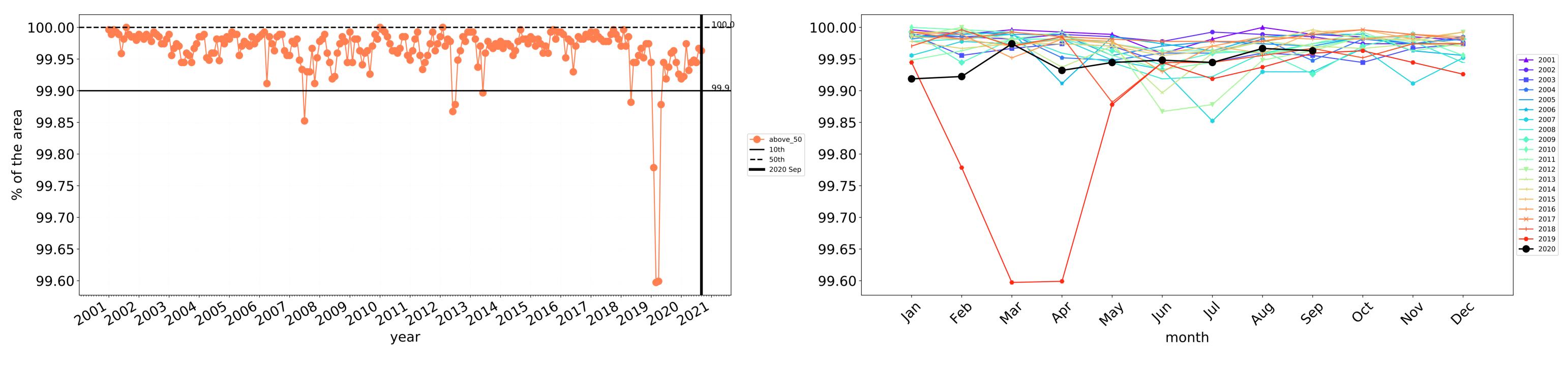
Proportion of each land class in area





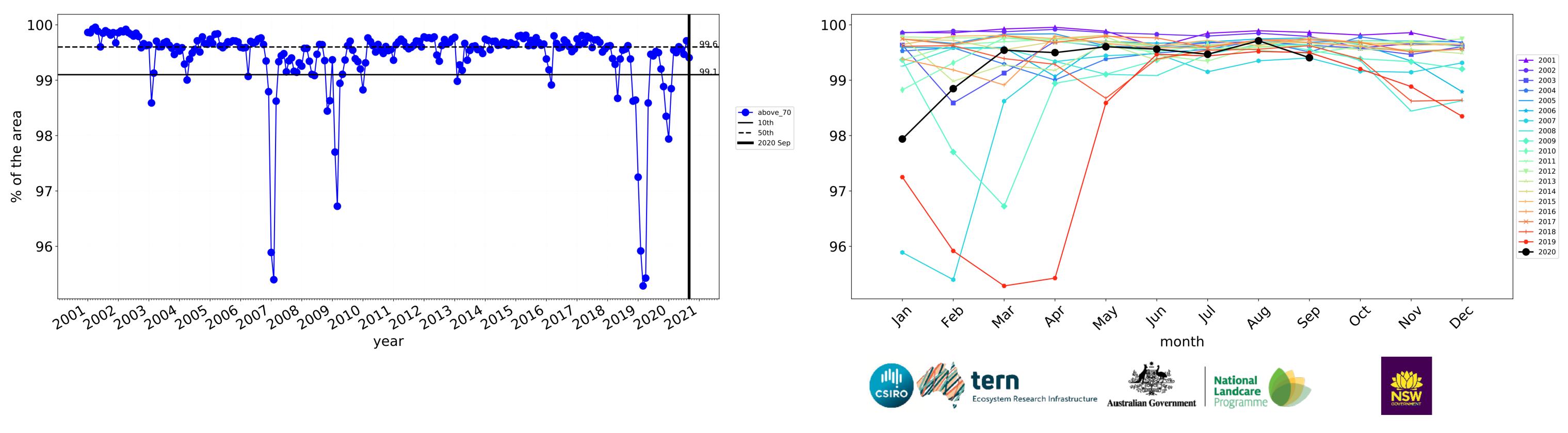
20

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



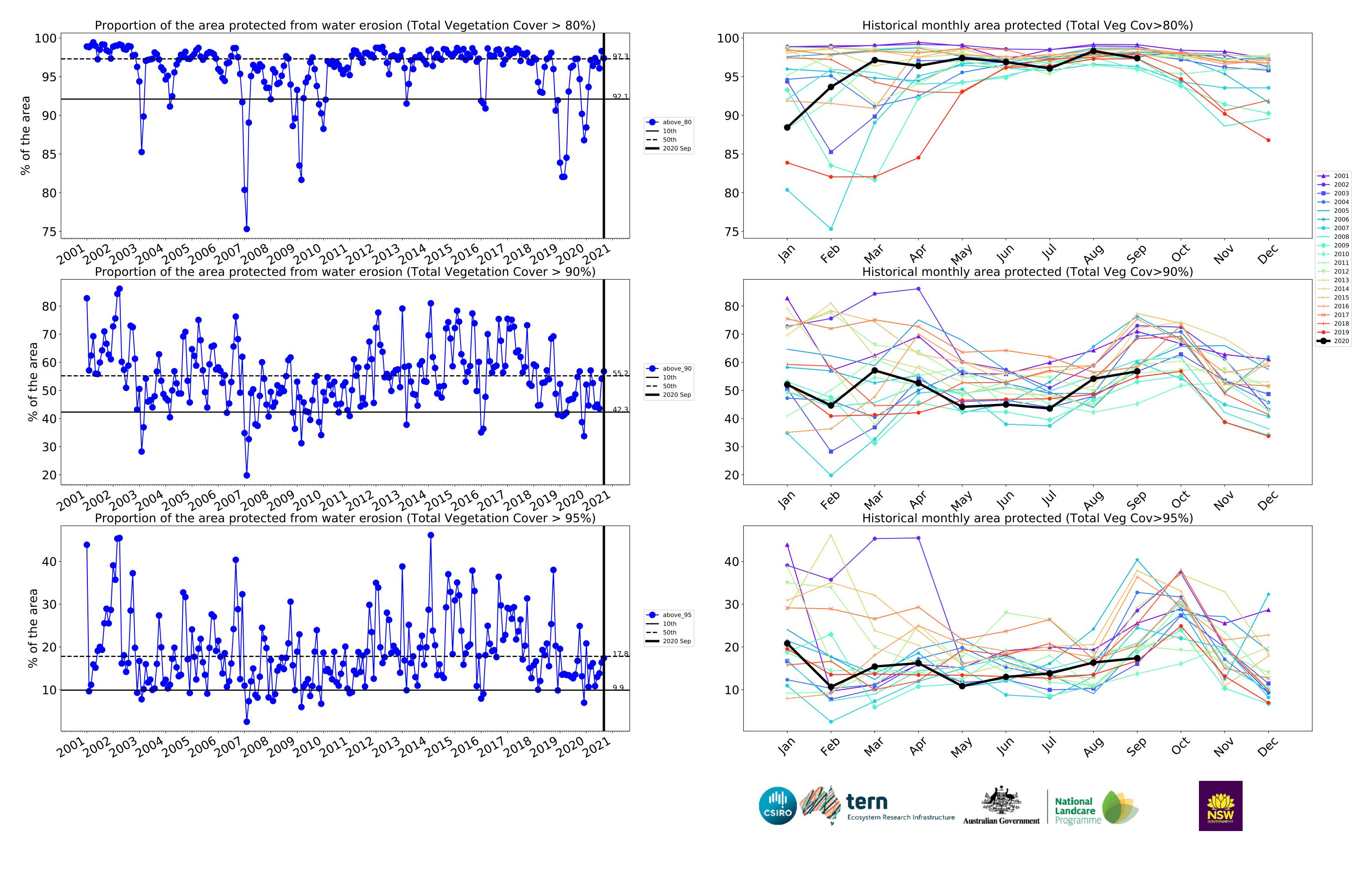
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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%)



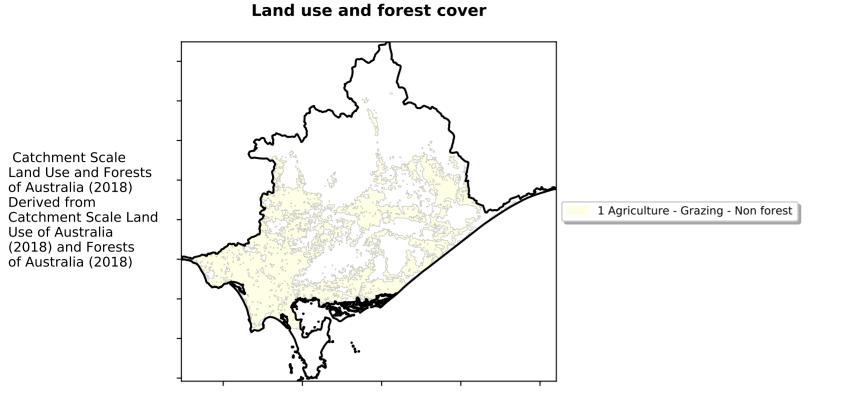
Grazing non forest

12%100%

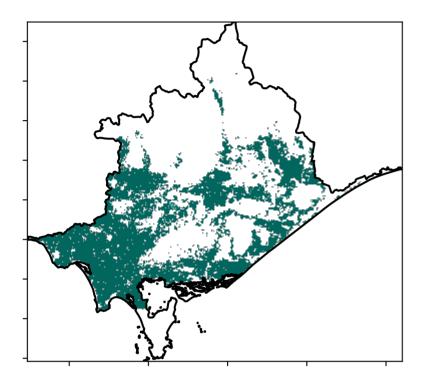
52°10°10°10

320050010

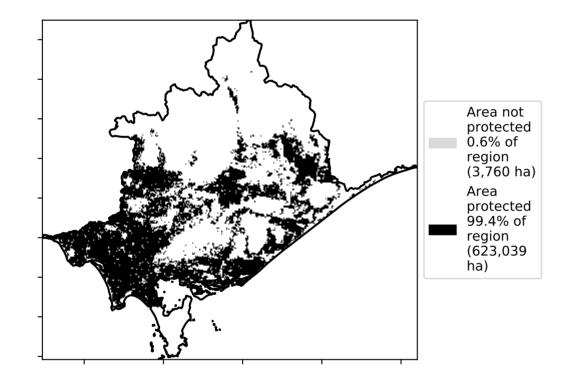
0.30%



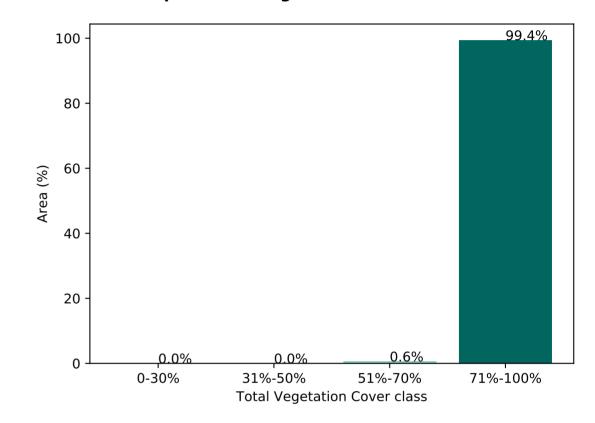
Total Vegetation Cover [%]



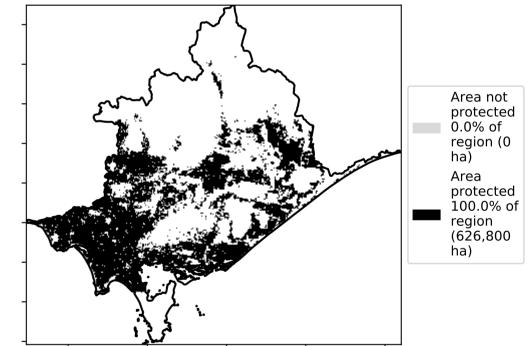
% Area protected from water erosion (>70%)



Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)

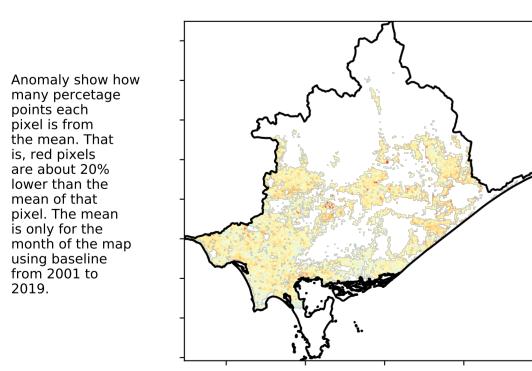


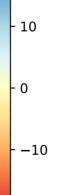
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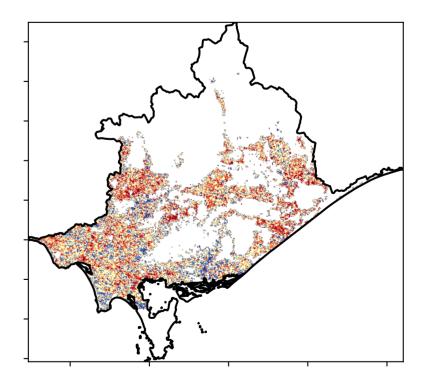
Total Vegetation Cover Anomaly [%]





-20

Total Vegetation Cover Decile [%]

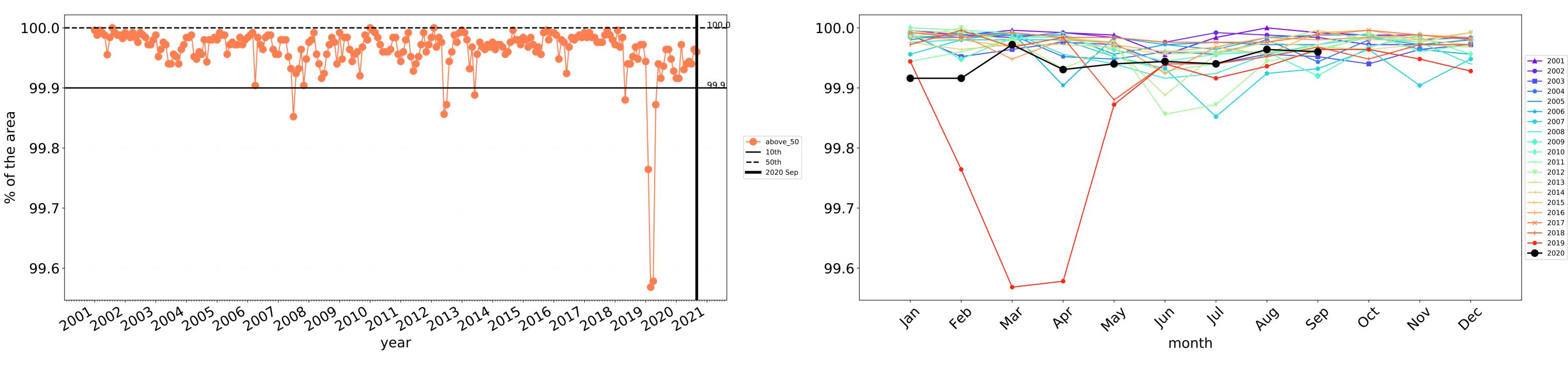




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the man using baseline

the map using baseline from 2001 to 2019.

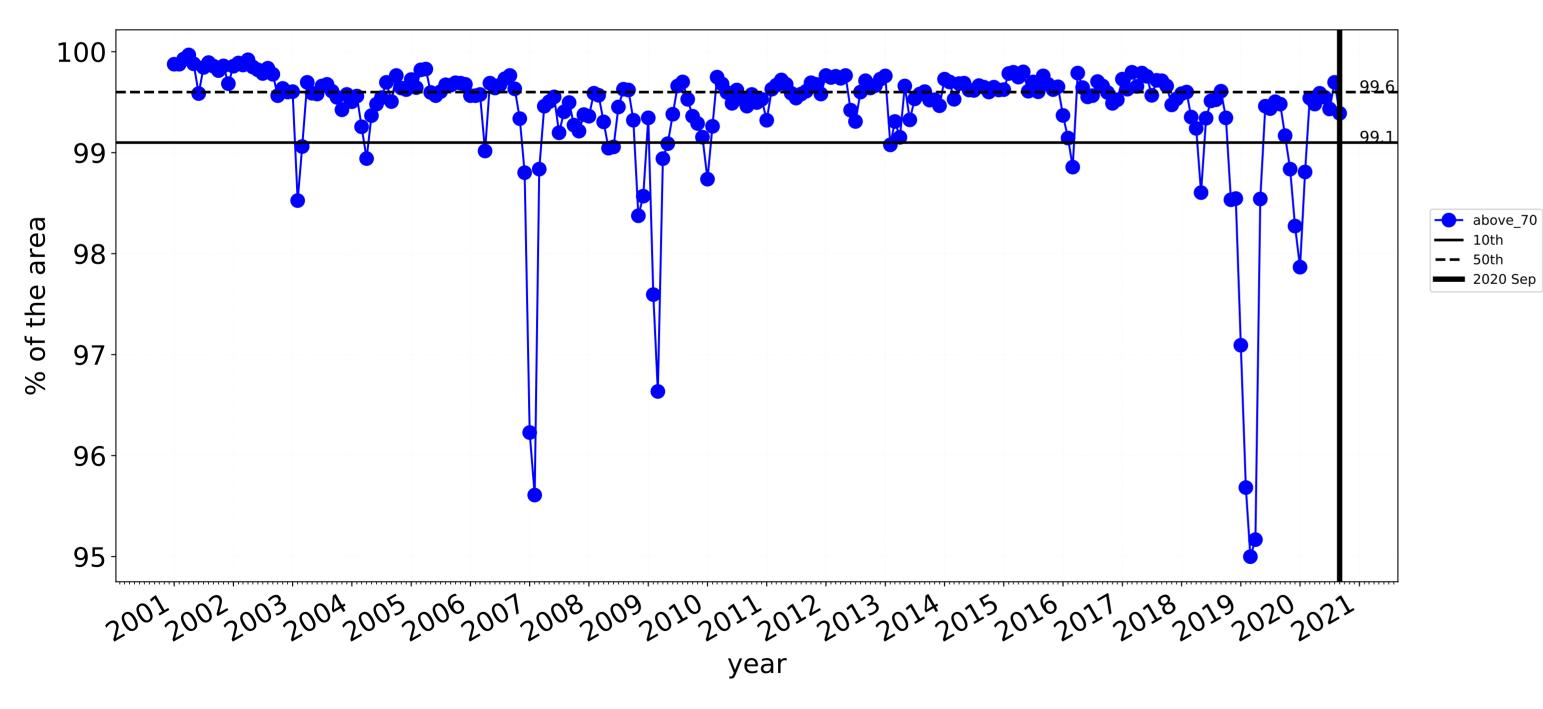
- 20



100-

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

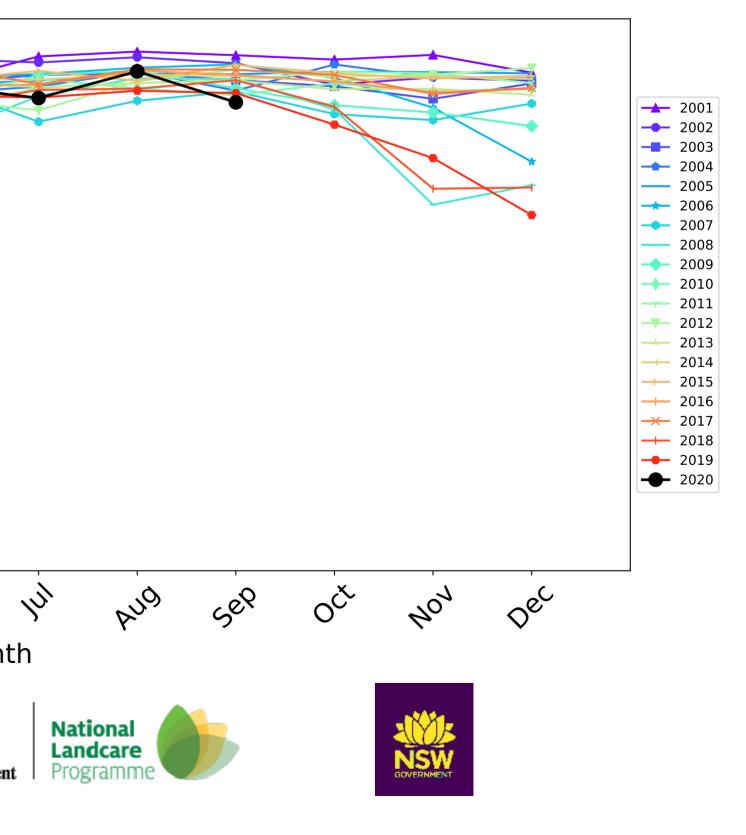
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

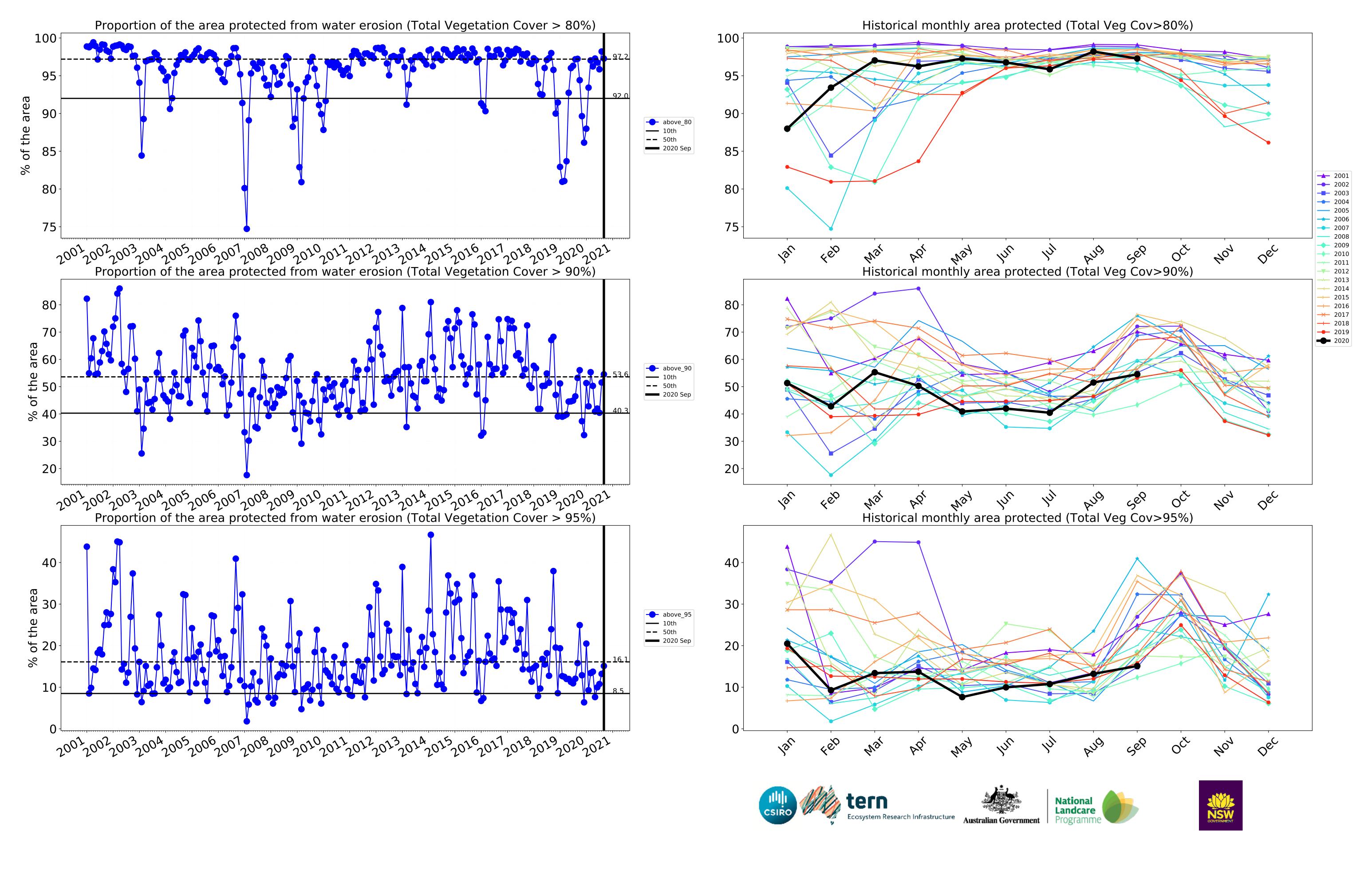


Wind erosion historical monthly area protected (Total Veg Cov >50%)

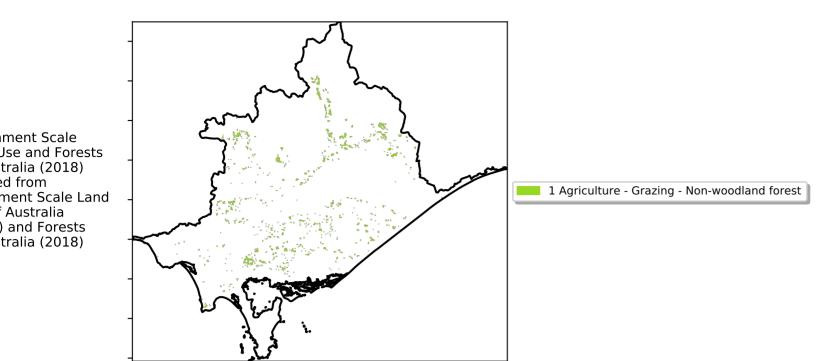
99 98 97 96 95 feb lar way In W31 PQ1 month tern Ecosystem Research Infrastructure Australian Government

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





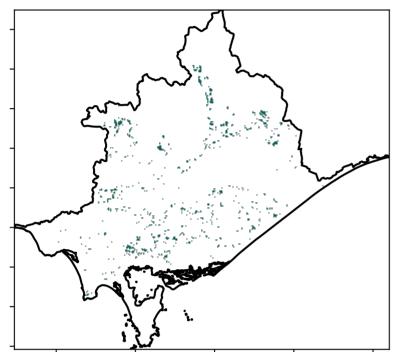
Grazing - Forest (non woodland)

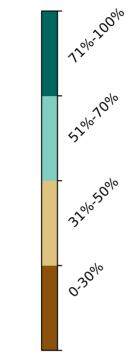


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Total Vegetation Cover [%]

Land use and forest cover





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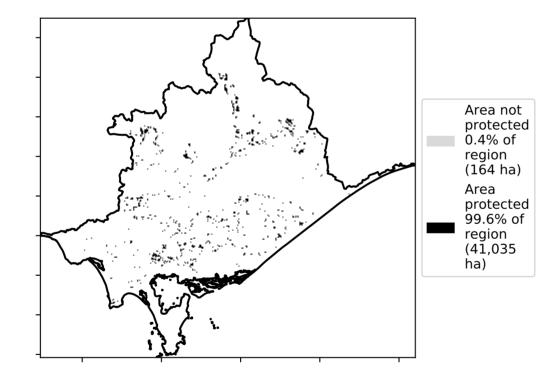
- 10

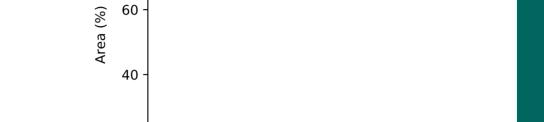
- 0

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% Area protected from water erosion (>70%)





0.0%

0-30%

0.0%

Total Vegetation Cover class

% Area protected from wind erosion (>50%)

31%-50%

100

80

20

0

Proportion of vegetation cover class in area

99.6%

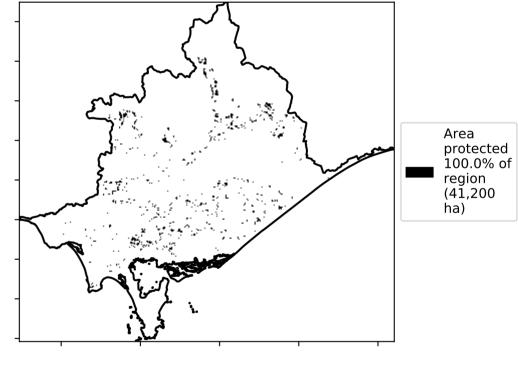
71%-100%

0

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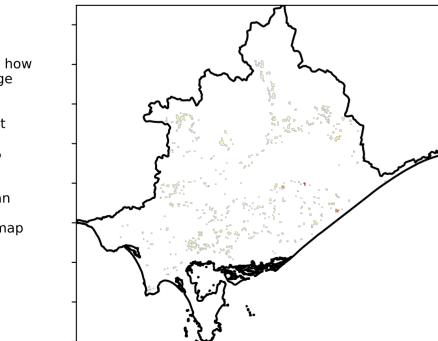
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0.4%

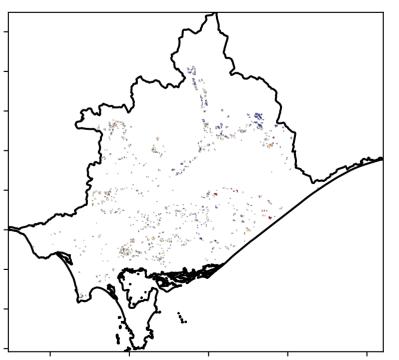
51%-70%

Total Vegetation Cover Anomaly [%]



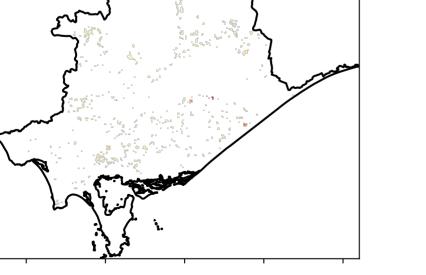
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]



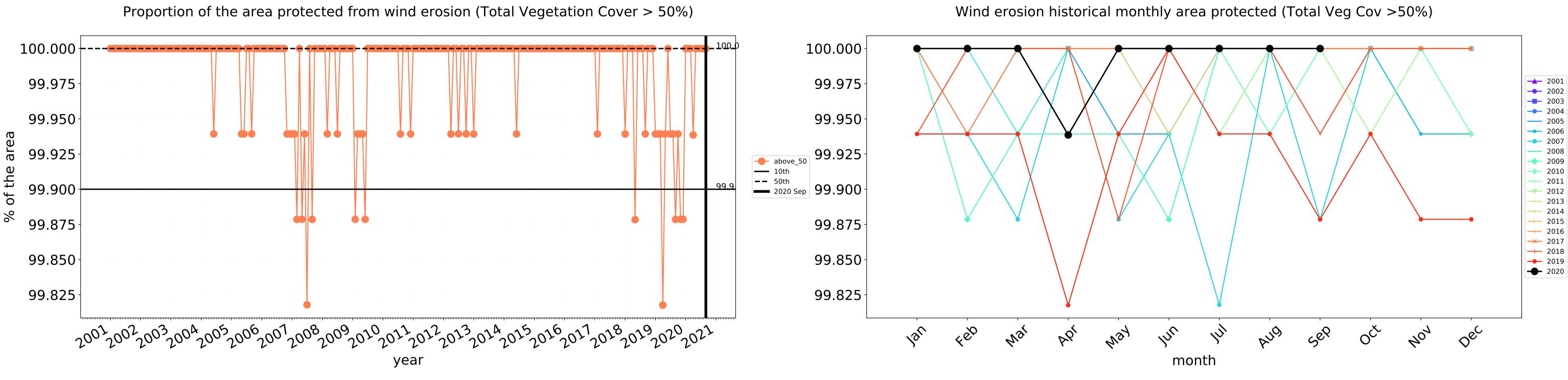


Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

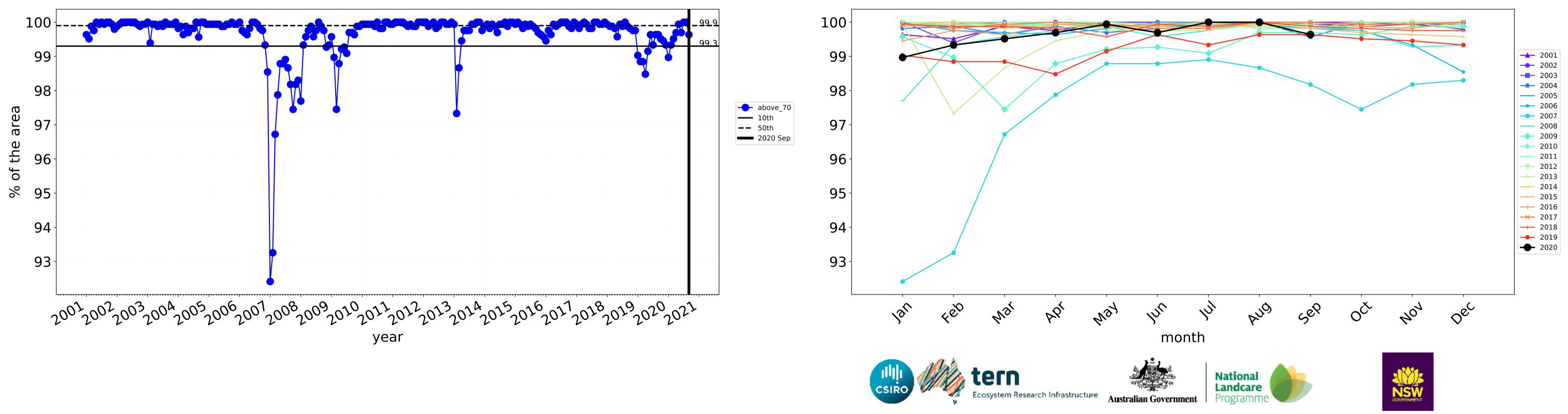




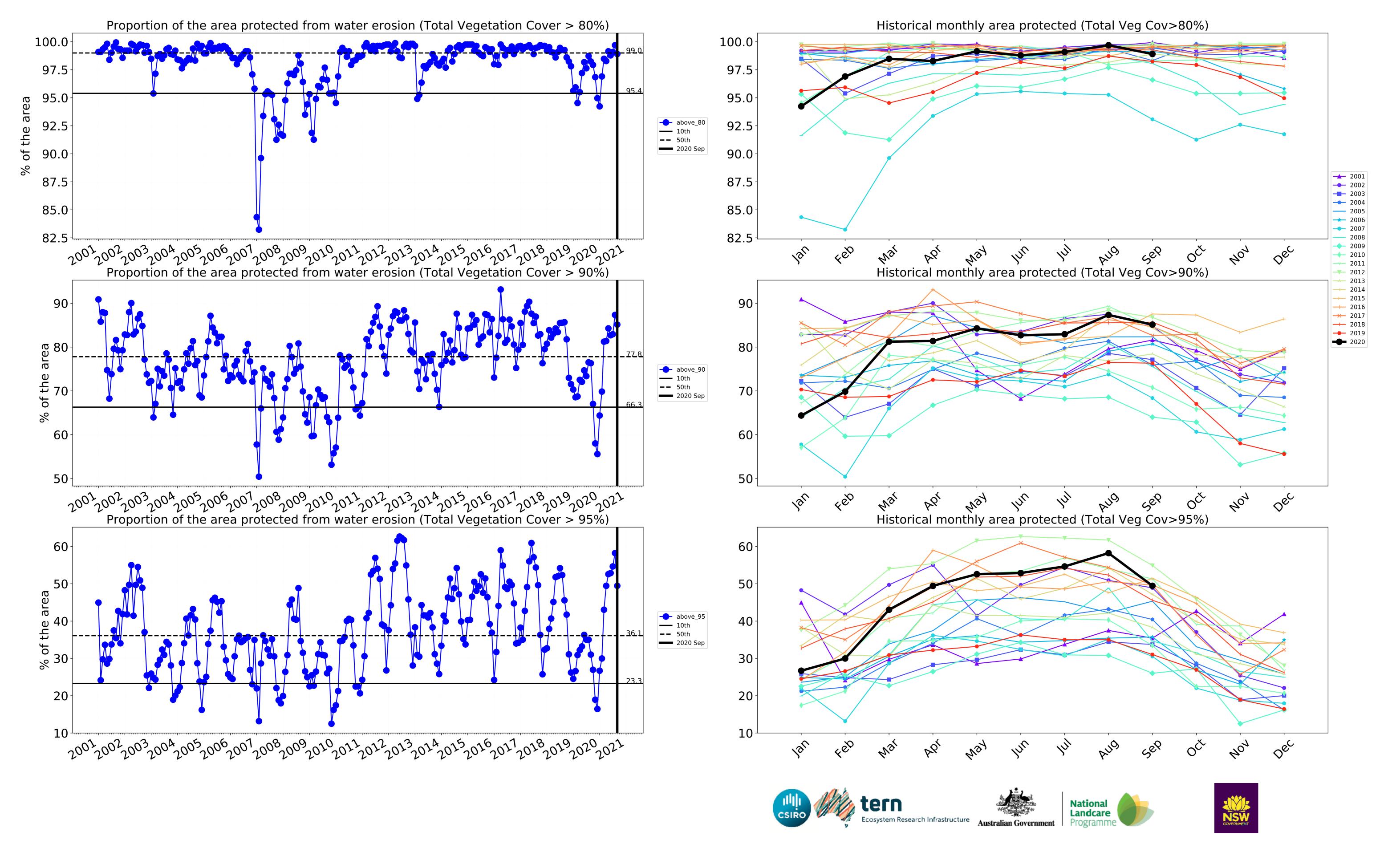




Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

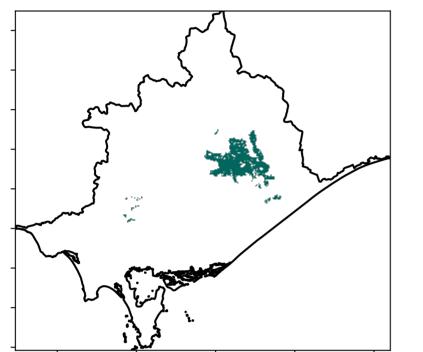


Irrigation

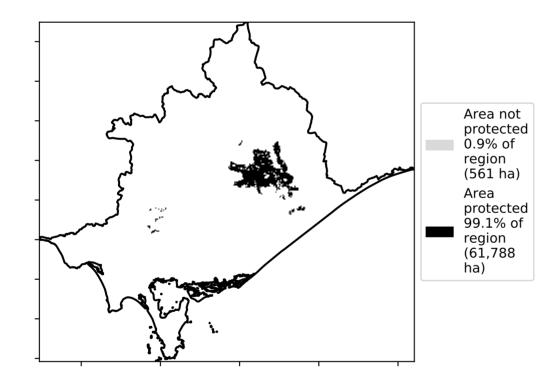
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

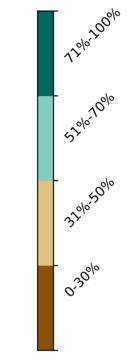
Land use and forest cover

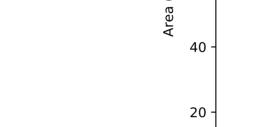
Total Vegetation Cover [%]



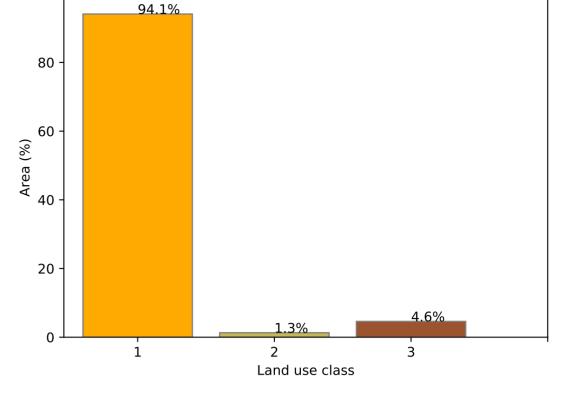
% Area protected from water erosion (>70%)



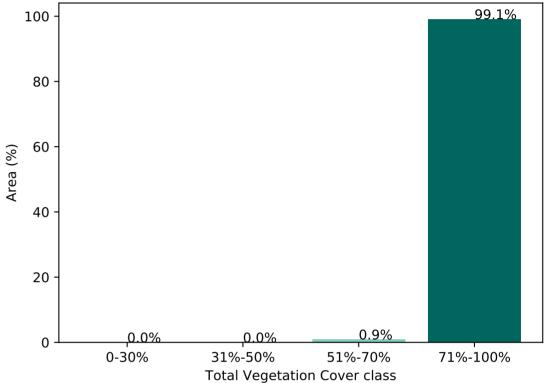




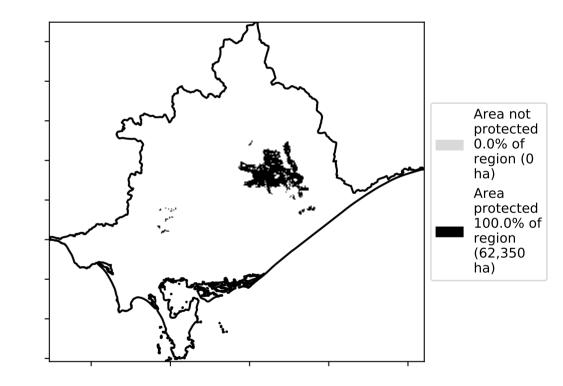
Proportion of each land class in area



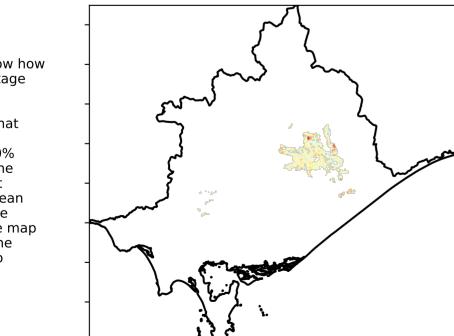
Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]



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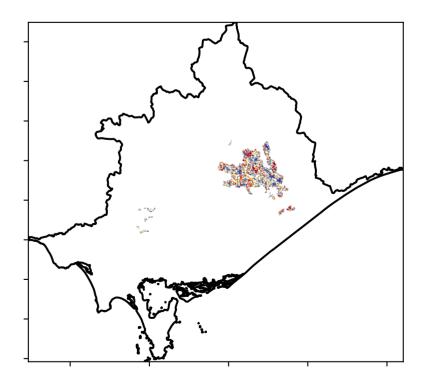
Total Vegetation Cover Decile [%]

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Deciles show where the pixel value lies in the

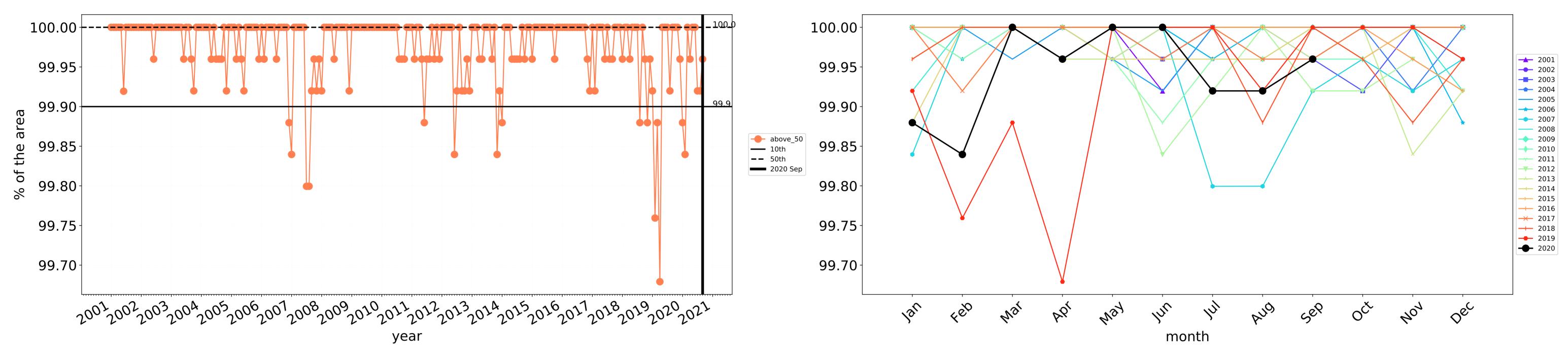
record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

the map using baseline from 2001 to 2019.

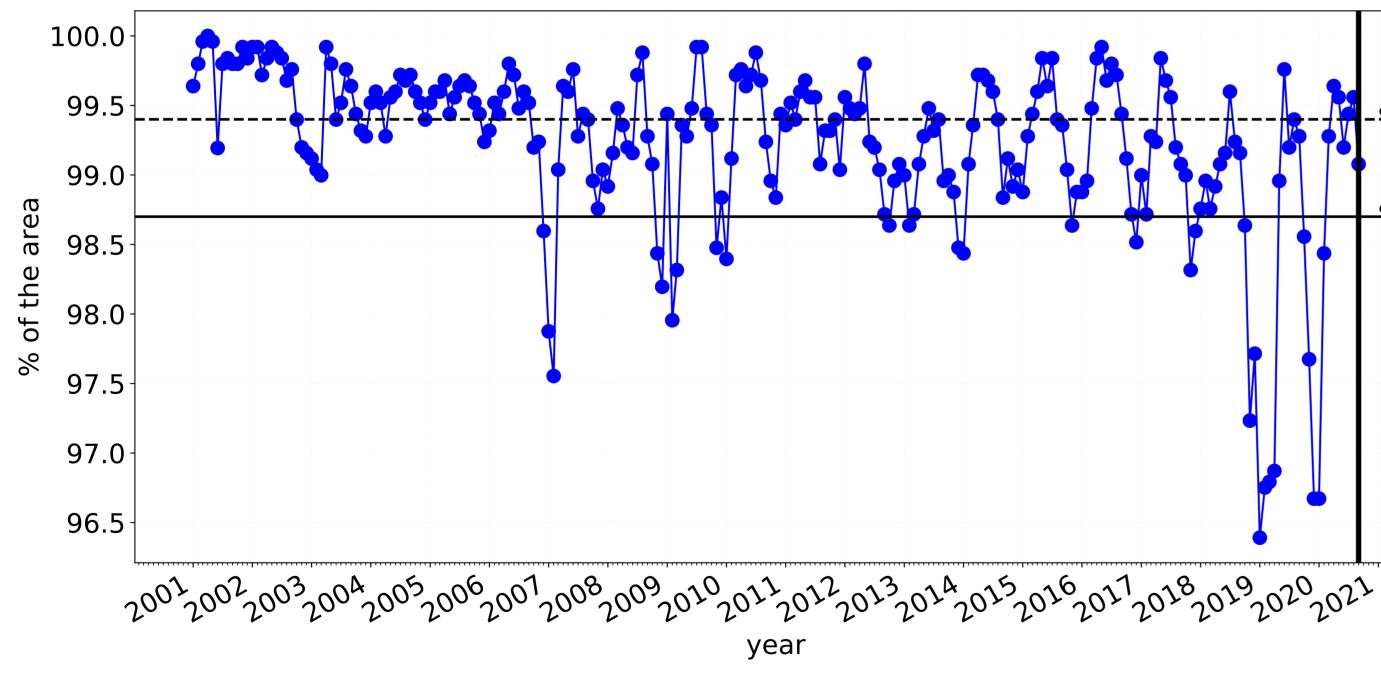
29

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



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

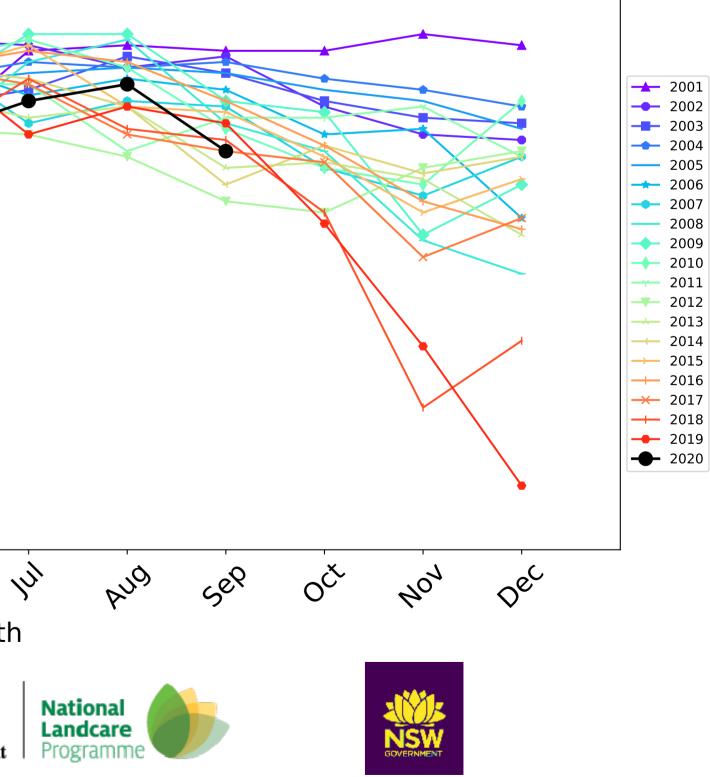
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

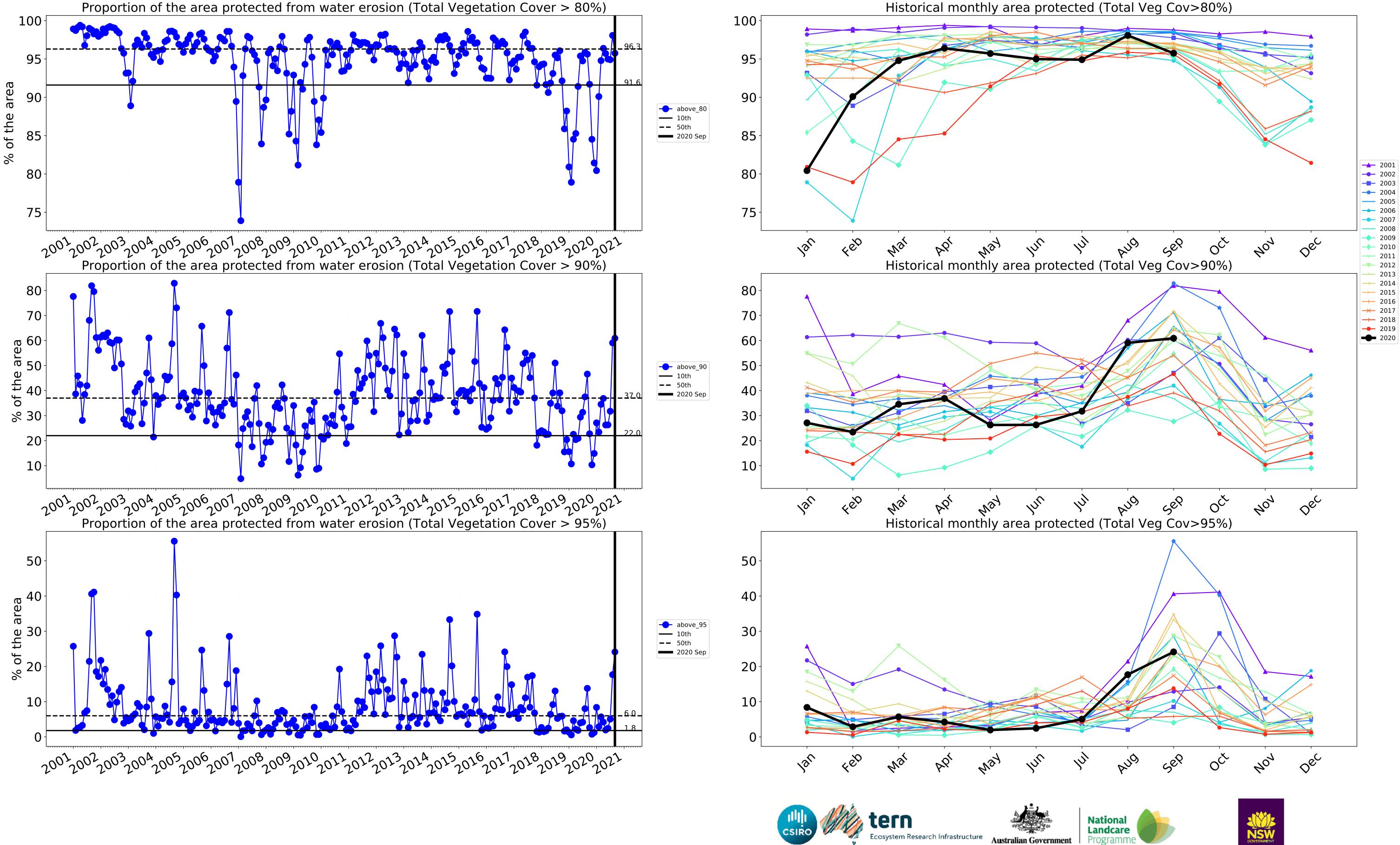


Wind erosion historical monthly area protected (Total Veg Cov >50%)

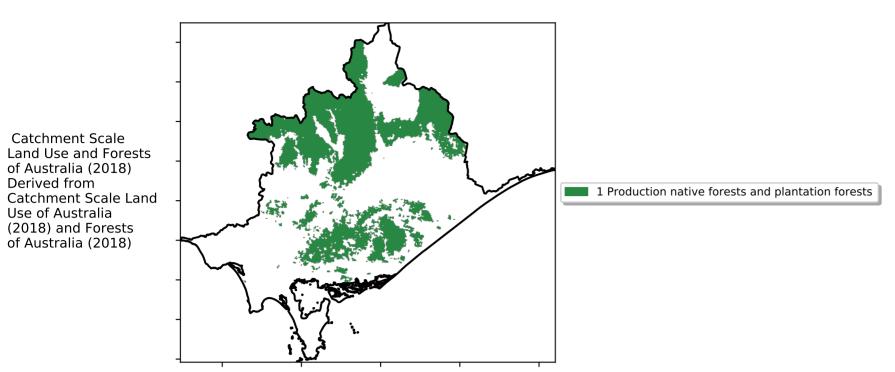
100.0 99.5 99.0 ---- above_70 **—** 10th 98.5 **--** 50th 98.0 97.5 97.0 96.5 4eb May In 12r PQ' War month mh tern Ecosystem Research Infrastructure Australian Government

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



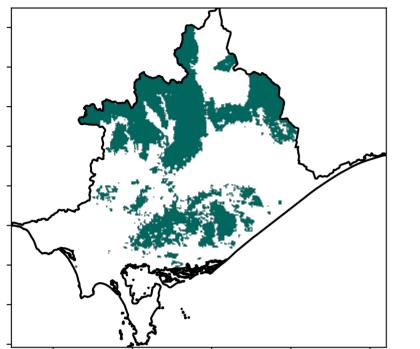


Production native forests and plantation forests

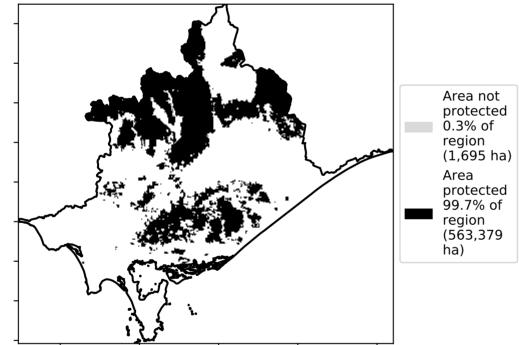


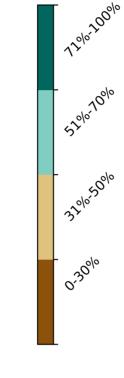
Land use and forest cover

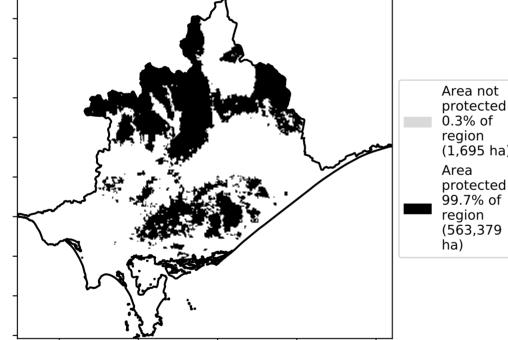
Total Vegetation Cover [%]



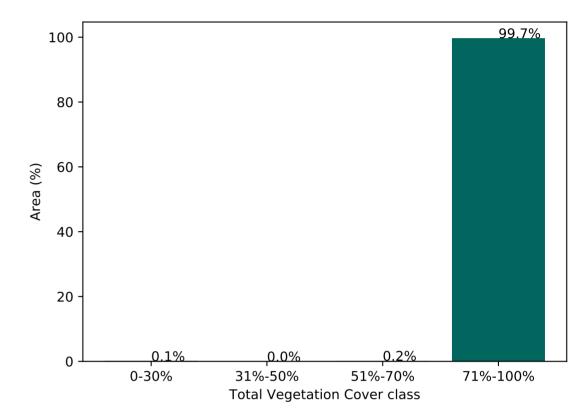
% Area protected from water erosion (>70%)



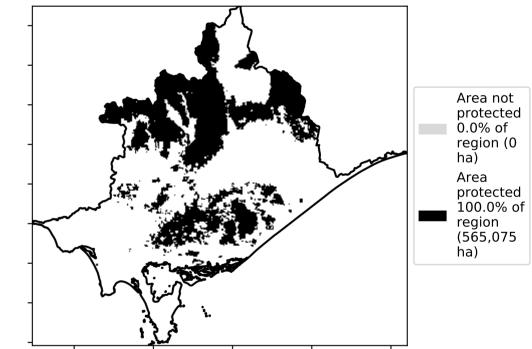








% Area protected from wind erosion (>50%)

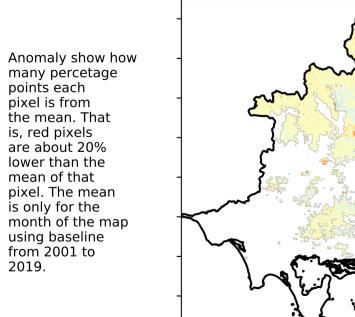


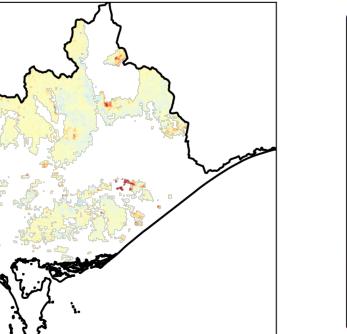
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Total Vegetation Cover Anomaly [%]



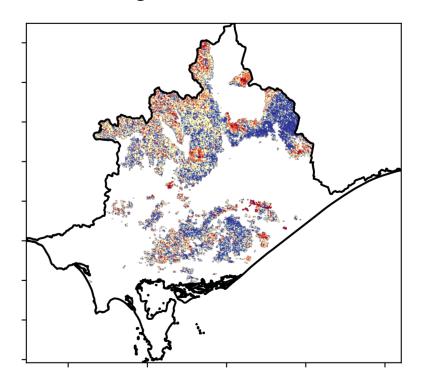


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Total Vegetation Cover Decile [%]





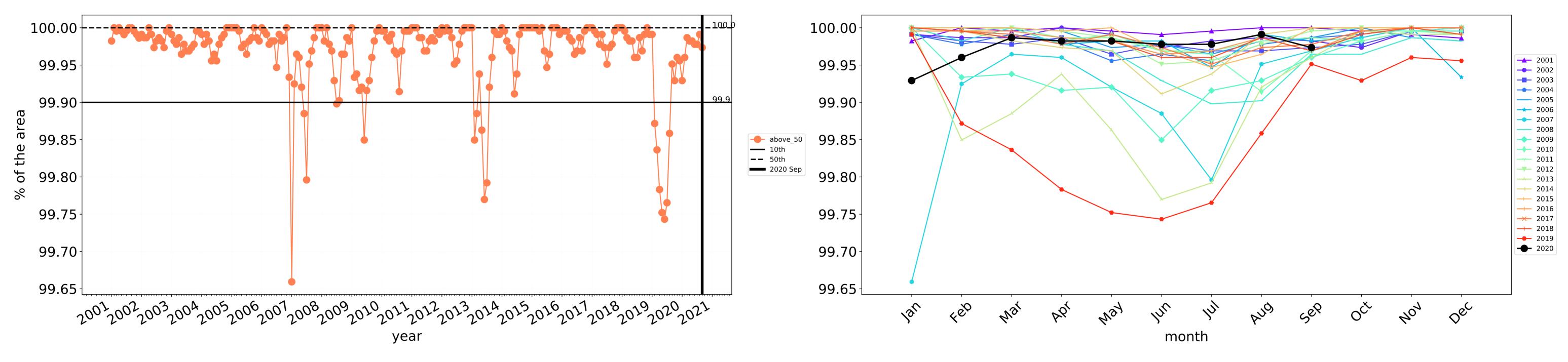
Deciles show where the pixel value lies in the

record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of

records for that month of

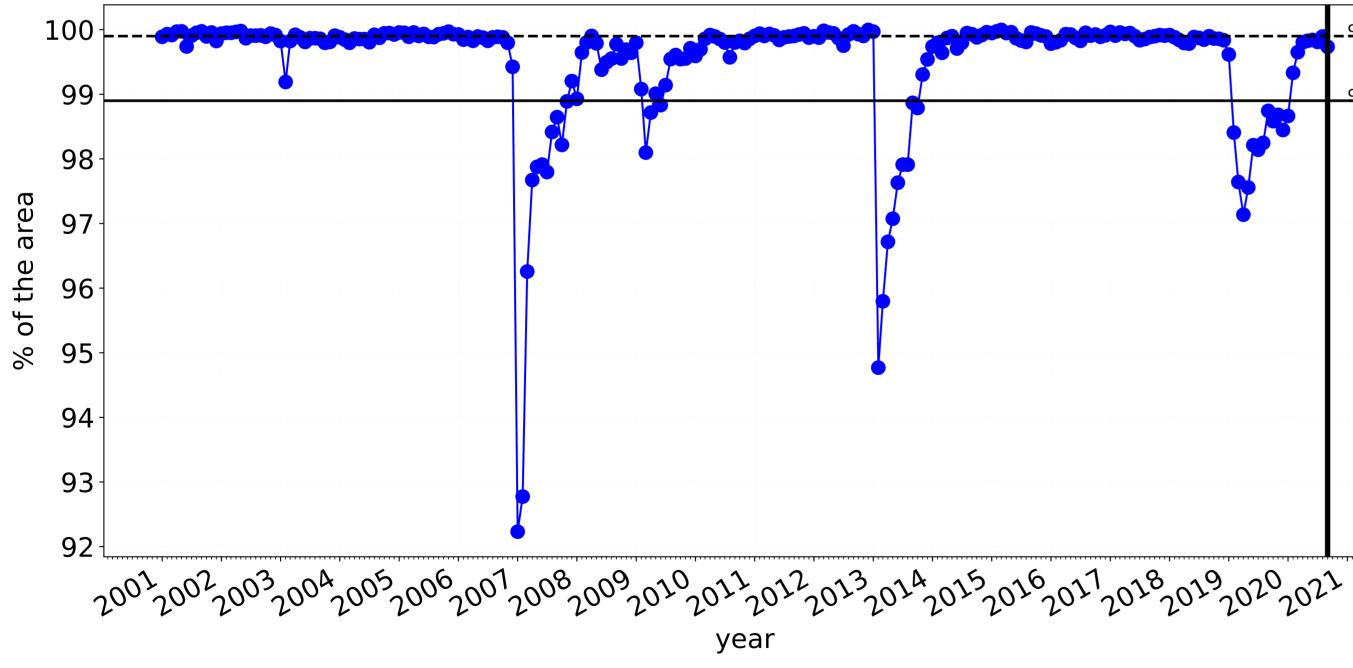
the map using baseline from 2001 to 2019.

Production native forests and plantation forests timeseries



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

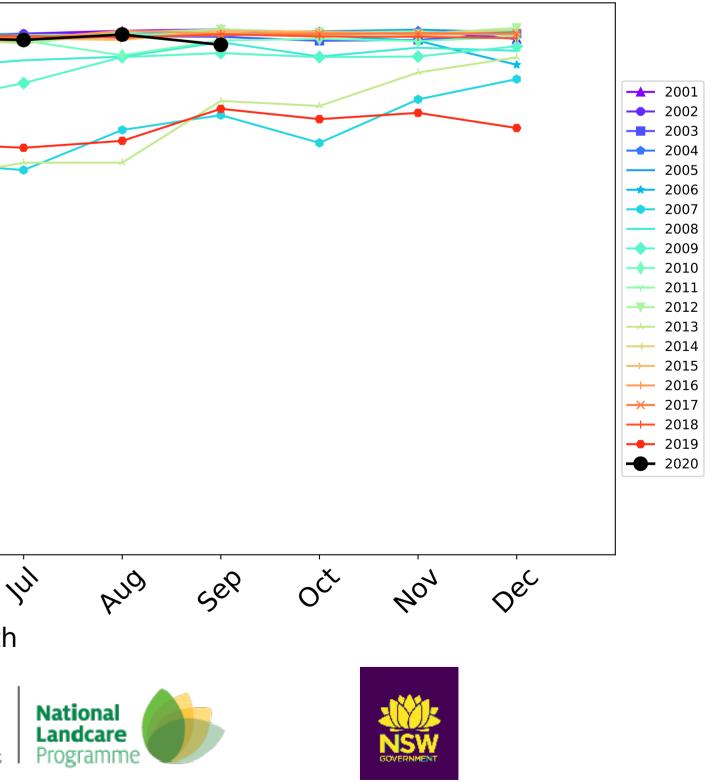
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

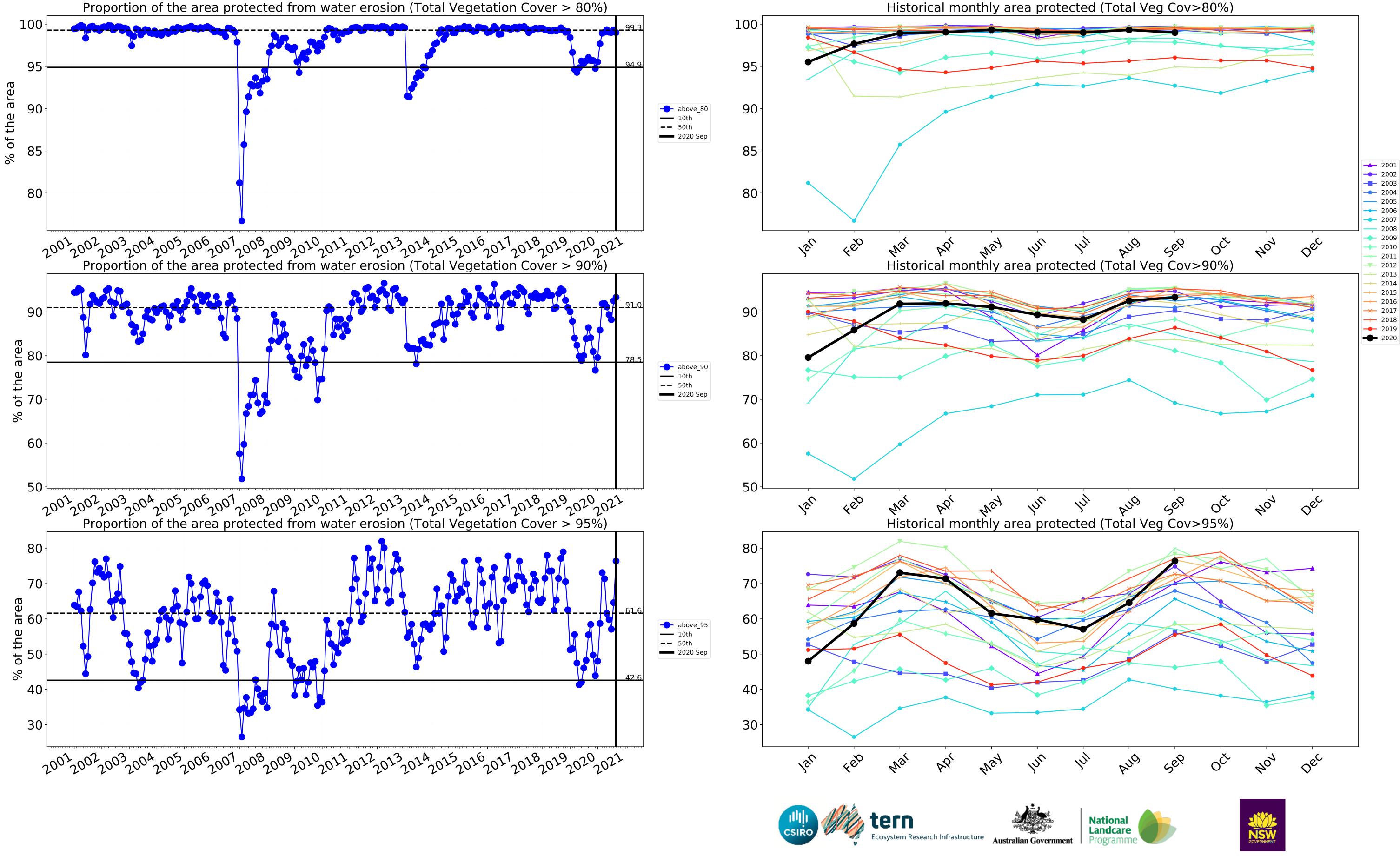


Wind erosion historical monthly area protected (Total Veg Cov >50%)

100 _ 99.9 99 00 98 ---- above_70 **—** 10th 97 **--** 50th **——** 2020 Sep 96 95 94 93 92 feb Jan In way War PQ month tern Ecosystem Research Infrastructure Australian Government

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





West Gippsland (1,685,675 ha and no data 39,969 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	1,685,675	100.0% 1,685,250	99.9% 1,683,150	98.7% 1,663,225	95.9% 1,616,625	71.1% 1,198,875	41.6% 701,850
Conservation and natural environments	273,225	99.9% 272,950	99.5% 271,875	97.3% 265,950	91.8% 250,800	75.7% 206,800	45.3% 123,825
Conservation and natural environments non forest	44,425	99.5% 44,200	97.4% 43,250	87.6% 38,900	73.7% 32,750	47.3% 21,000	24.3% 10,800
Conservation and natural environments Woodland forest	73,225	99.9% 73,175	99.9% 73,125	99.1% 72,600	95.5% 69,925	76.6% 56,125	40.5% 29,675
Conservation and natural environments Forest (non woodland)	155,575	100.0% 155,575	100.0% 155,500	99.3% 154,450	95.2% 148,125	83.4% 129,675	53.6% 83,350
Agriculture	750,200	100.0% 750,175	100.0% 749,925	99.4% 745,500	97.2% 729,375	57.1% 428,025	18.0% 134,750
Grazing	678,050	100.0% 678,025	100.0% 677,800	99.4% 674,025	97.4% 660,350	56.8% 385,025	17.4% 117,900
Grazing non forest	626,800	100.0% 626,775	100.0% 626,550	99.4% 622,975	97.3% 609,725	54.5% 341,850	15.1% 94,725
Grazing - Forest (non woodland)	41,200	100.0% 41,200	100.0% 41,200	99.6% 41,050	98.9% 40,750	85.1% 35,075	49.5% 20,375
Irrigation	62,350	100.0% 62,350	100.0% 62,325	99.1% 61,775	95.7% 59,700	60.9% 37,975	24.1% 15,050
Production native forests and plantation forests	565,075	100.0% 565,050	100.0% 564,925	99.7% 563,575	99.0% 559,500	93.3% 527,450	76.4% 431,575

