### LGA Carrathool\_(A) (NSW) - Vegetation cover soil protection report Aug 2019

This report provides information about vegetation covering the soil surface for a region during a single month with comparison to previous years. Vegetation cover indicates where soil is likely to be protected from wind and or water (hillslope) erosion. Results are shown for the whole region (polygon) and also separated by land use and tree cover. Different land uses are likely to have different cover patterns and targets. Reporting is most reliable with less than 20% tree cover.

Carrathool (A)

- Context
  - o Map: Land use and forest cover
  - o Chart: Land use and forest cover area
- Total vegetation cover for this month
  - o Map: vegetation cover classified into 4 classes
  - o Chart: vegetation cover area classified into 4 classes
- Areas protected from erosion for the month
  - o Map: wind erosion protection (>50% cover)
  - o Map: water erosion protection (>70% cover)
- Comparison with previous years
  - o Map: anomaly compare this month to the average cover from the same month in previous years
  - o Map: deciles rank this month against the same month in previous years
- Time series
  - o Wind erosion protection time series: percentage of the area of the region with greater than 50% cover for each month in the archive (orange lines)
  - o Water erosion protection time series: percentage of the area of the region with greater than 70% cover for each month of the archive (blue lines).
  - o Rainfall: millimetres rainfall each month (black lines)
- Time series stacked by year
  - o Wind erosion protection time series: percentage of the area of the region with greater than 50% cover for each month in the archive (orange lines) in case of 5th percentile is less than 80i
  - o Water erosion protection time series: percentage of the area of the region with greater than 70% cover for each month of the archive (blue lines). in case of 5th percentile is less than 80
- Water erosion protection on higher slopes. As slope increases, more cover is required to control water erosion. The thresholds reported are:
  - o the percentage area with pixels greater than 80% total clover
  - o the percentage area with pixels greater than 90% total clover
  - o the percentage area with pixels greater than 95% total clover

The following pages repeat the above sequence for each land use and forest cover class. For example

- All agricultural lands, that is grazing, cropping plus Horticulture (depending on what land use is present)
- Grazing lands by forest classes if present
- Cropping lands
- Irrigation lands
- Protected areas by forest classes if present

### **Explanatory notes:**

This report has been generated using MODIS fractional vegetation cover information available in Rangelands and Pasture Productivity (RAPP) map tool. The report is based on an analysis of 500 metre pixels. Pixels with greater than or equal to 50% vegetation cover are generally considered to be protected from or have reduced soil loss by wind erosion, and pixels with greater than or equal to 70% vegetation cover are generally considered to also be protected from or have reduced soil loss from water (hillslope) erosion. Report used baseline from 2001 to 2019 for each month to generate anomalies and deciles. And it used threshold of 1% to create land use forest cover reports. Higher cover thresholds may be required for erosion protection in some regions. This report will be less applicable in areas with sparse forest (20-50% tree cover) or dense forest (> 50% tree cover). Therefore land use classes are divided by tree cover: 1) No forest is when there is less than 20% tree cover 2) Sparse forest, is when there is less than 20 to 50 % tree cover 3) Dense forest is greater than 50% tree 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 2019**

### Land use and forest cover

Landuse map of area

based on 2015

catchment scale landuse and

Australia's National

where no forest is <

sparse is 20 to 50%

Anomaly show how many percetage points each

pixel is from

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.

the mean. That

and dense > 50% tree

Forest Inventory,

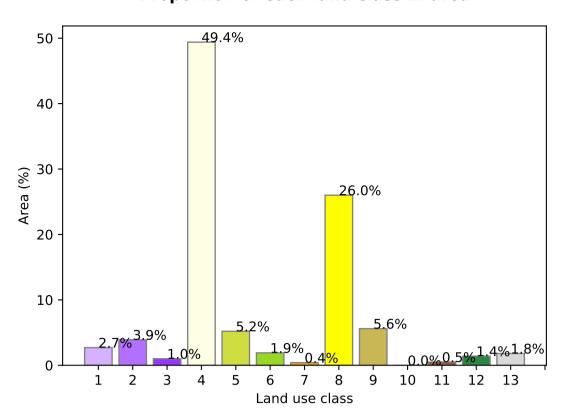
20% tree cover,

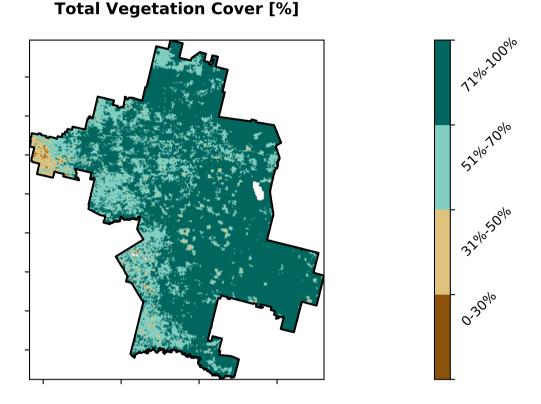
cover.

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

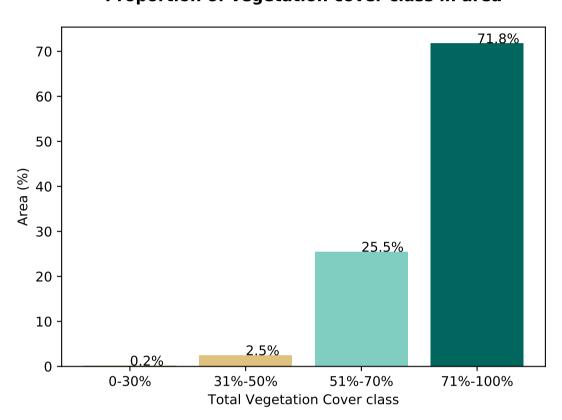
13 Other uses

### **Proportion of each land class in area**

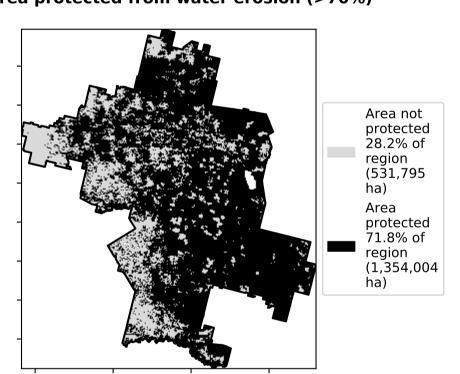




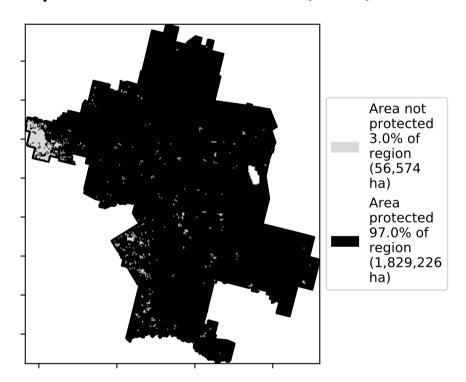
**Proportion of vegetation cover class in area** 



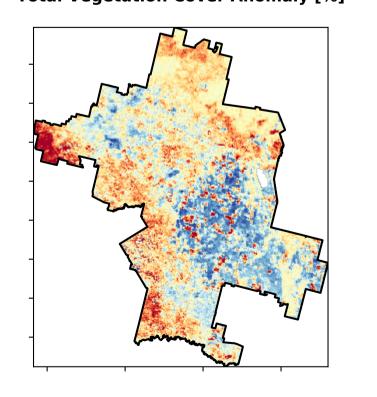
### % Area protected from water erosion (>70%)

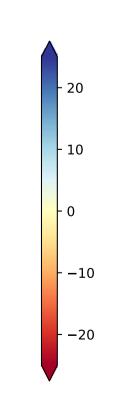


% Area protected from wind erosion (>50%)

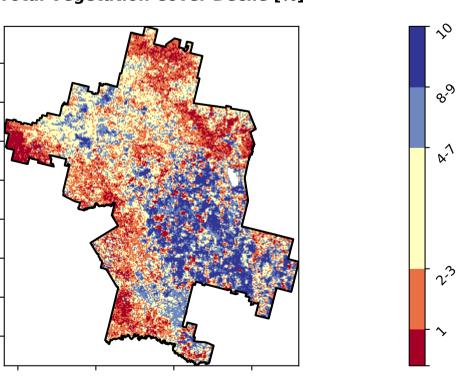


### **Total Vegetation Cover Anomaly [%]**





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.





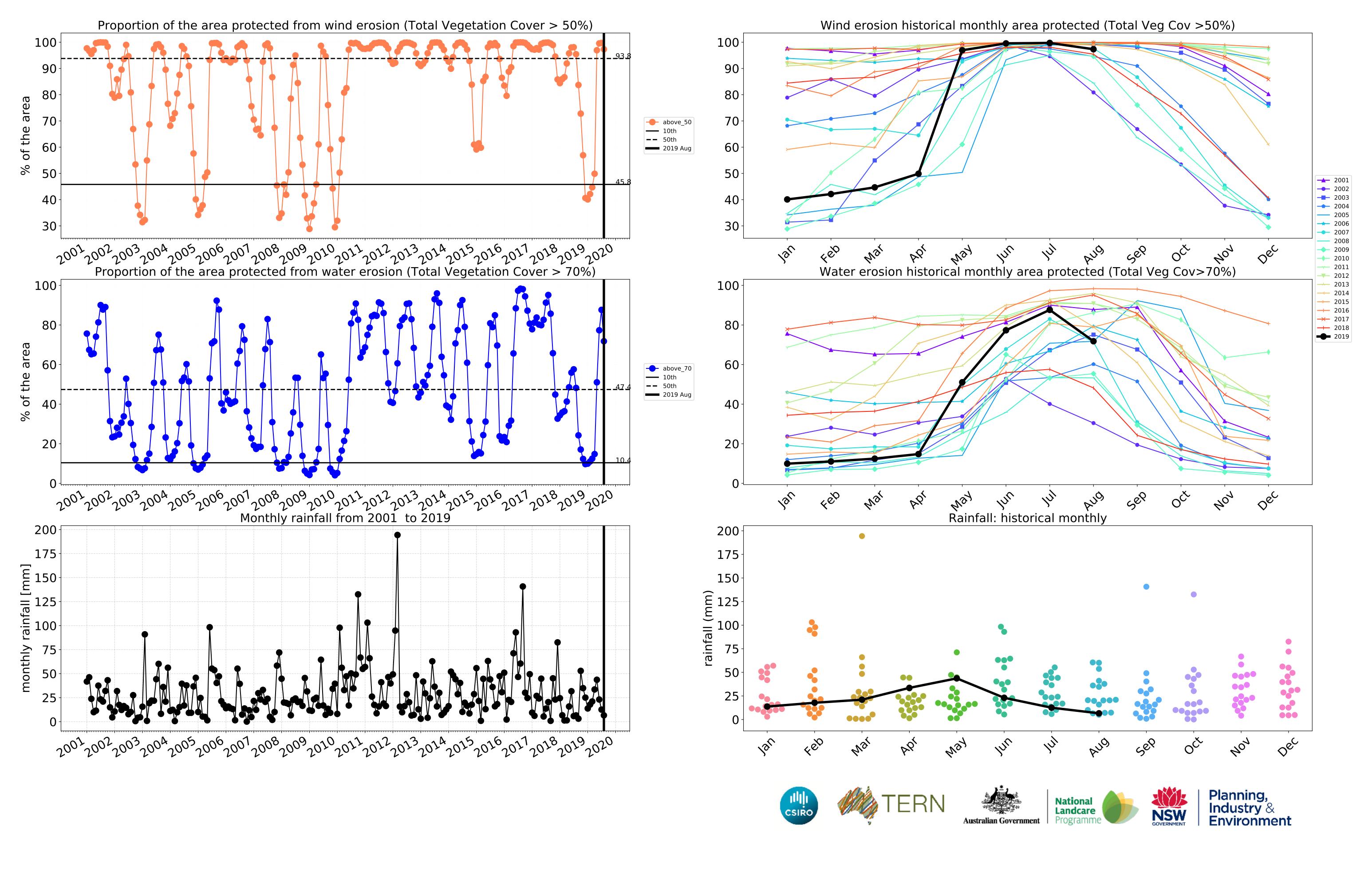












### **Conservation and natural environments**

### Land use and forest cover

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

pixel is from

is, red pixels are about 20% lower than the

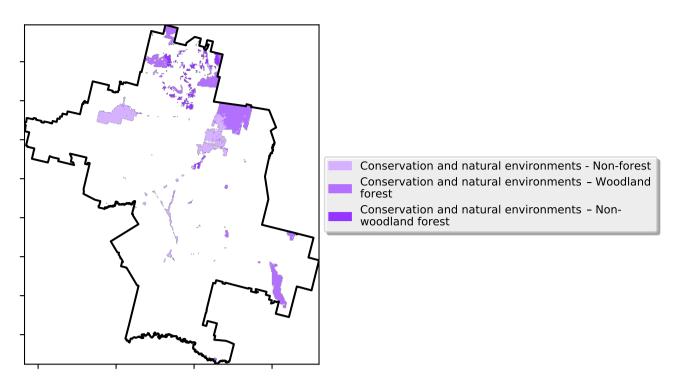
mean of that

pixel. The mean

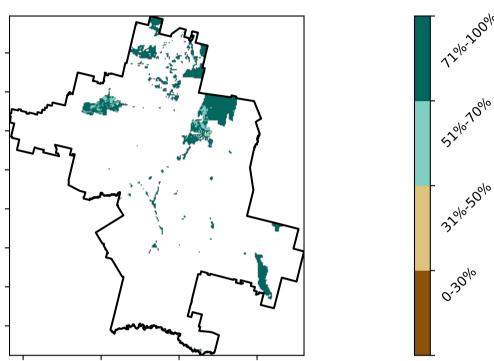
using baseline from 2001 to 2019.

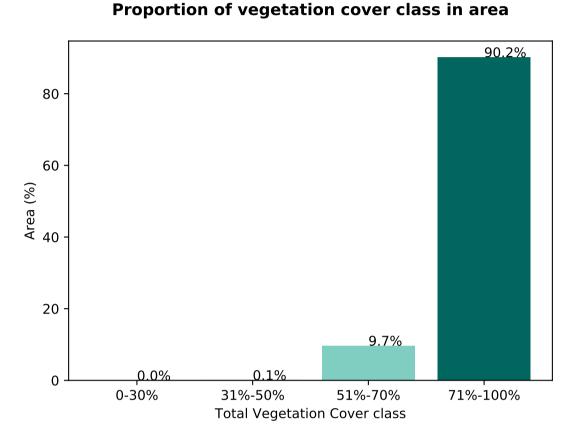
is only for the month of the map

the mean. That

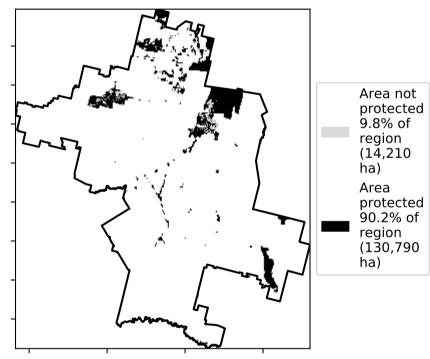


### **Total Vegetation Cover [%]**



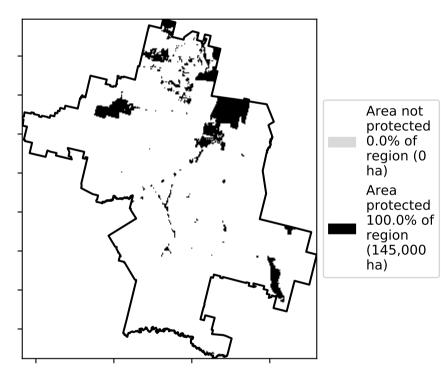


### % Area protected from water erosion (>70%)

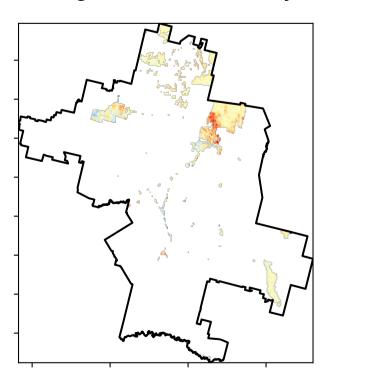


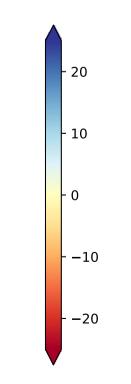
### protected 9.8% of

% Area protected from wind erosion (>50%)

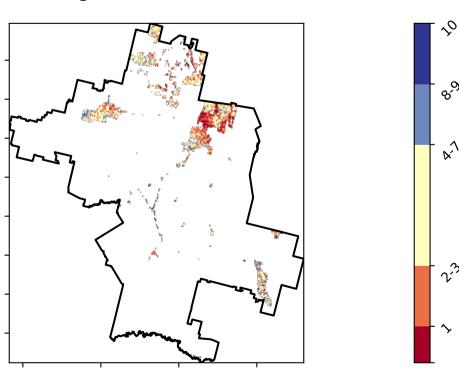


### **Total Vegetation Cover Anomaly [%]**





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.







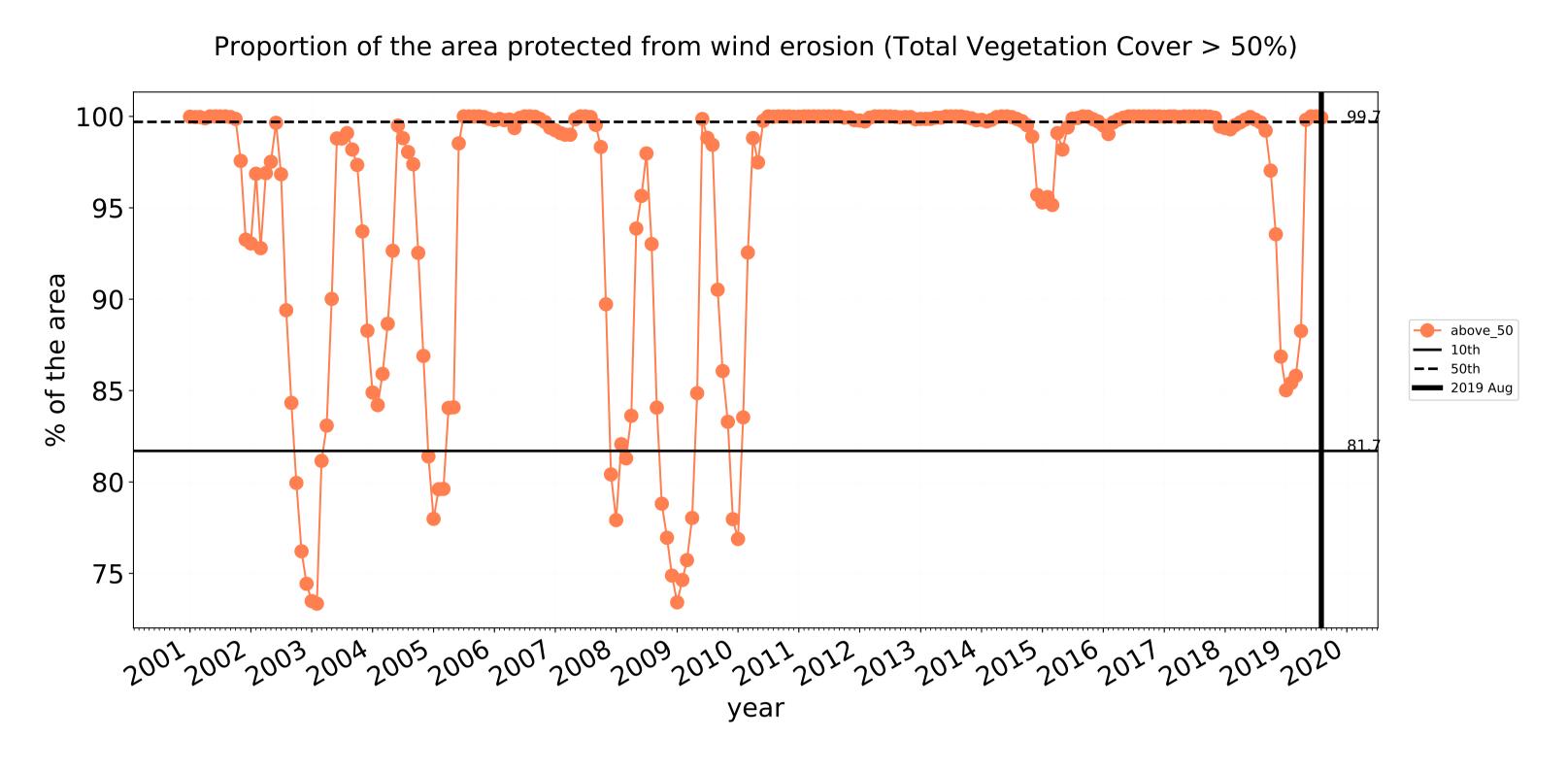


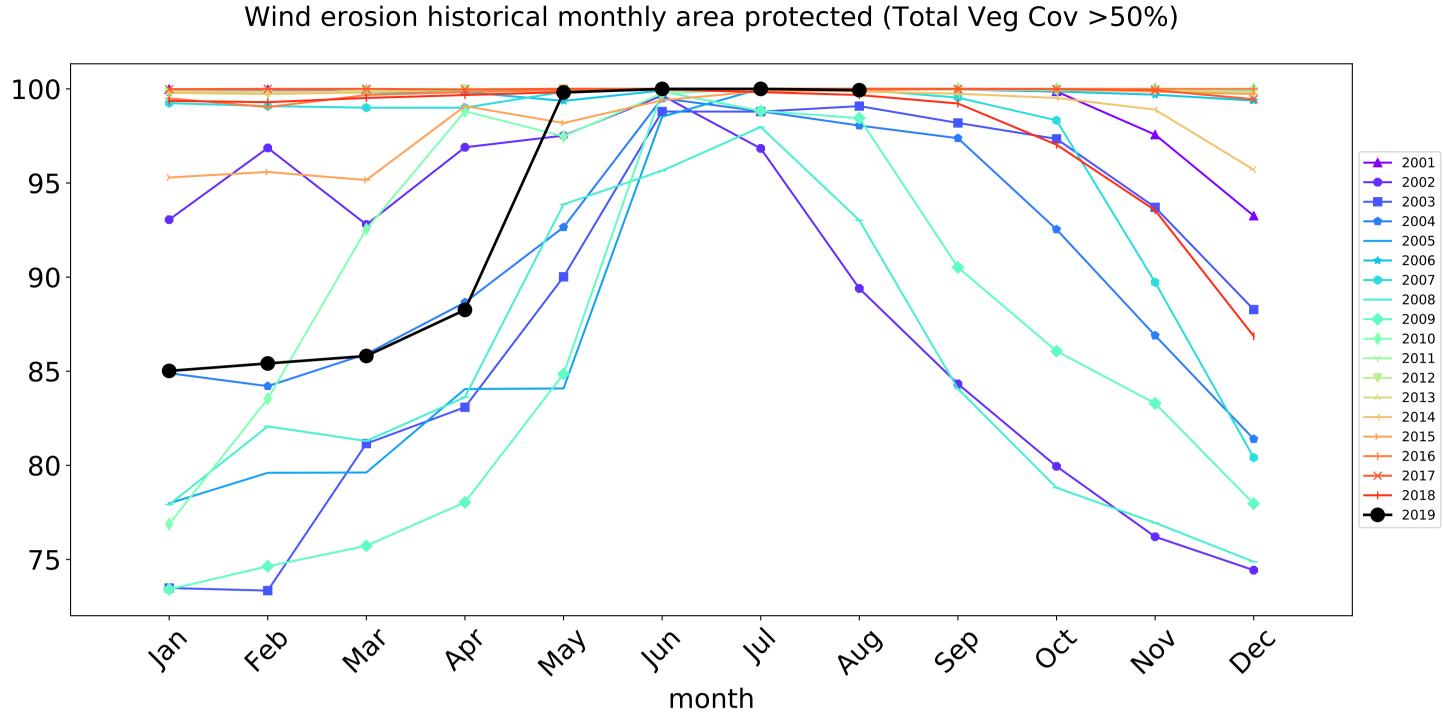


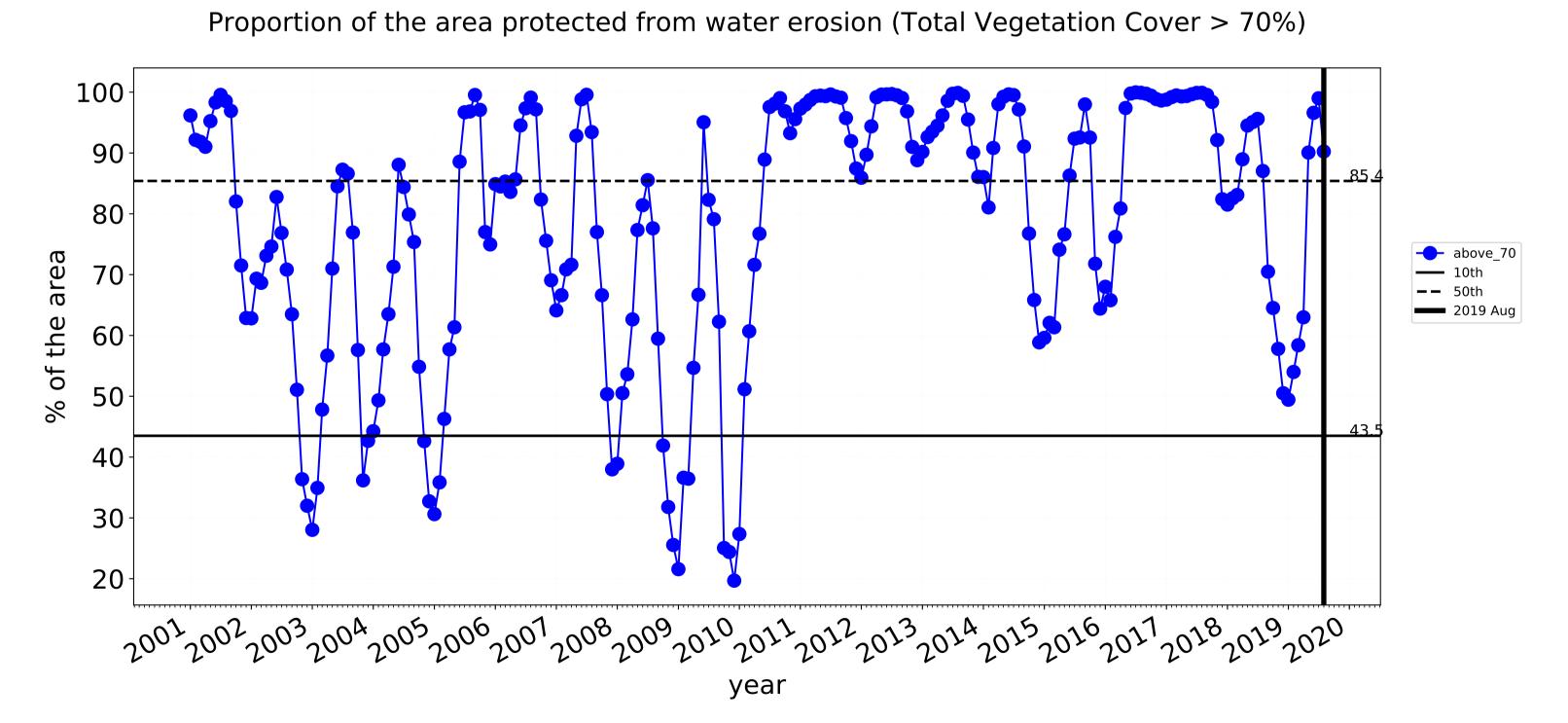


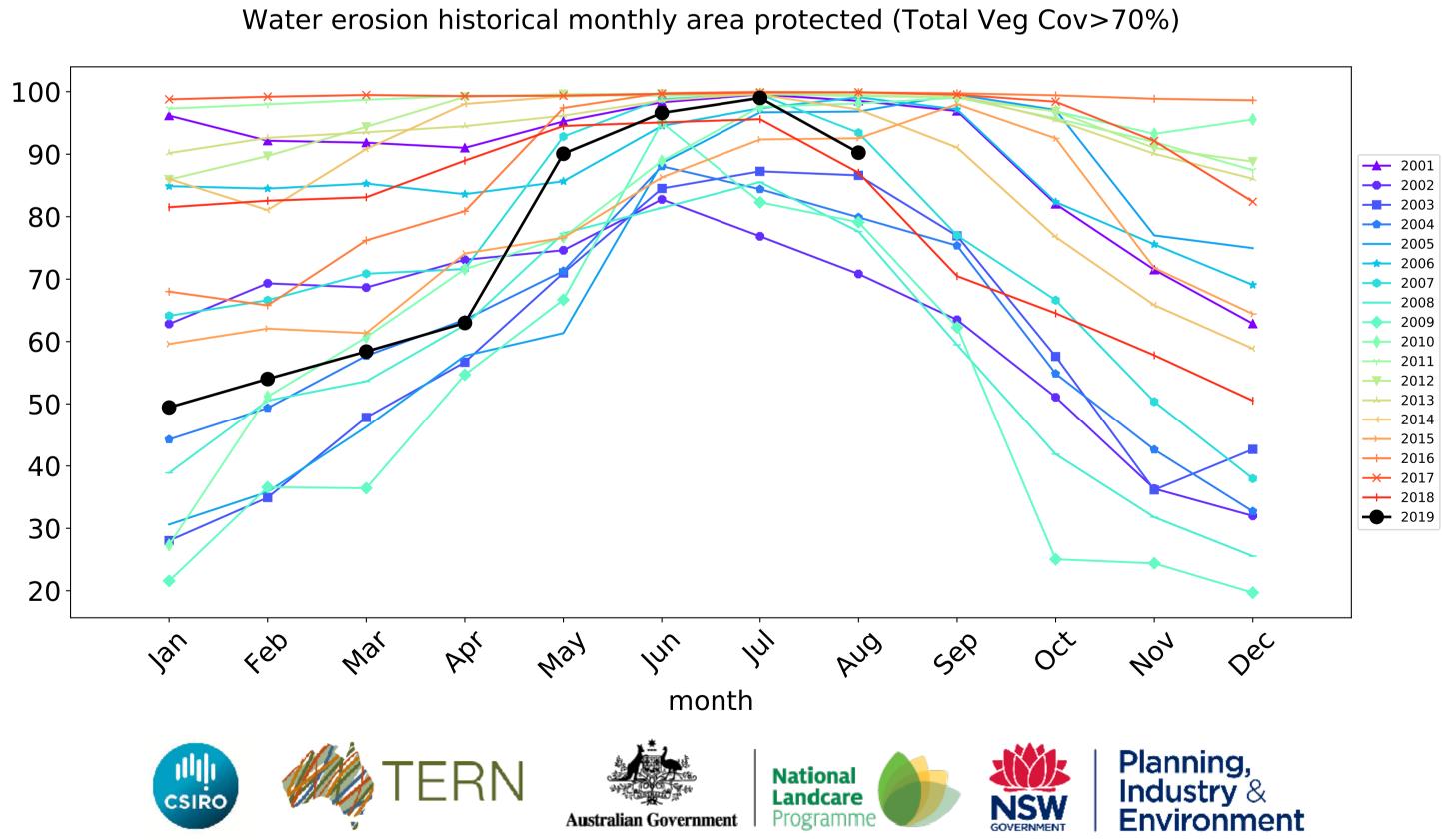


### **Conservation and natural environments timeseries**









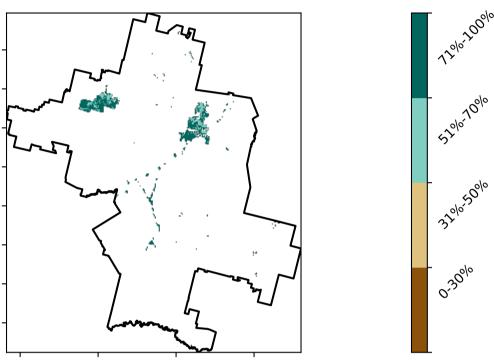
### **Conservation and natural environments non forest**

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

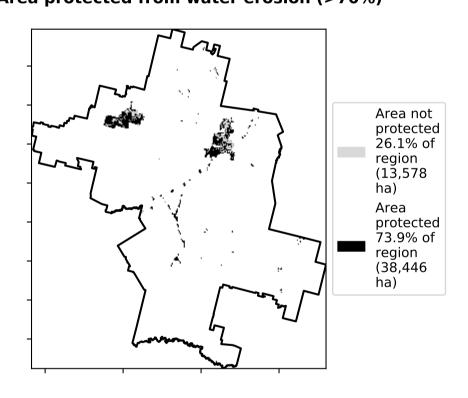
## Conservation and natural environments - Non-forest

### Total Vegetation Cover [%]

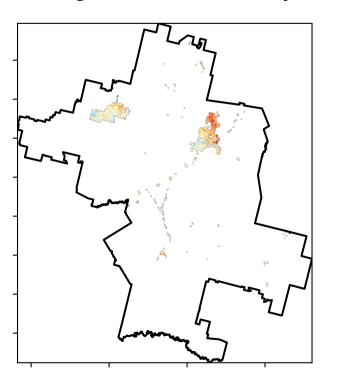
Land use and forest cover

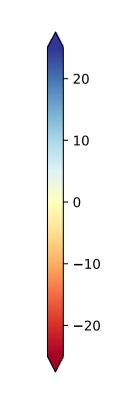


### % Area protected from water erosion (>70%)



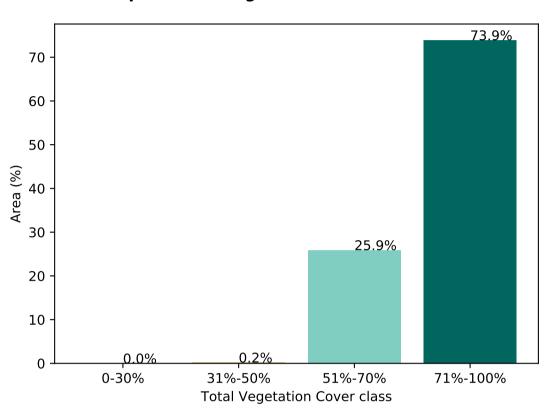
### **Total Vegetation Cover Anomaly [%]**



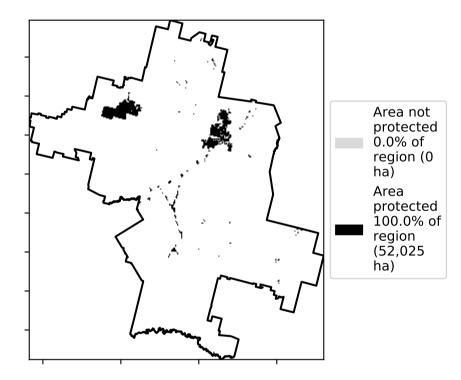


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

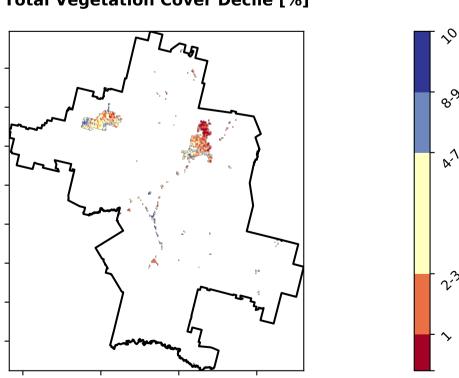
### Proportion of vegetation cover class in area



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



### Total Vegetation Cover Decile [%]





Anomaly show how many percetage points each

pixel is from

is, red pixels are about 20% lower than the

mean of that

pixel. The mean

using baseline from 2001 to 2019.

is only for the month of the map

the mean. That



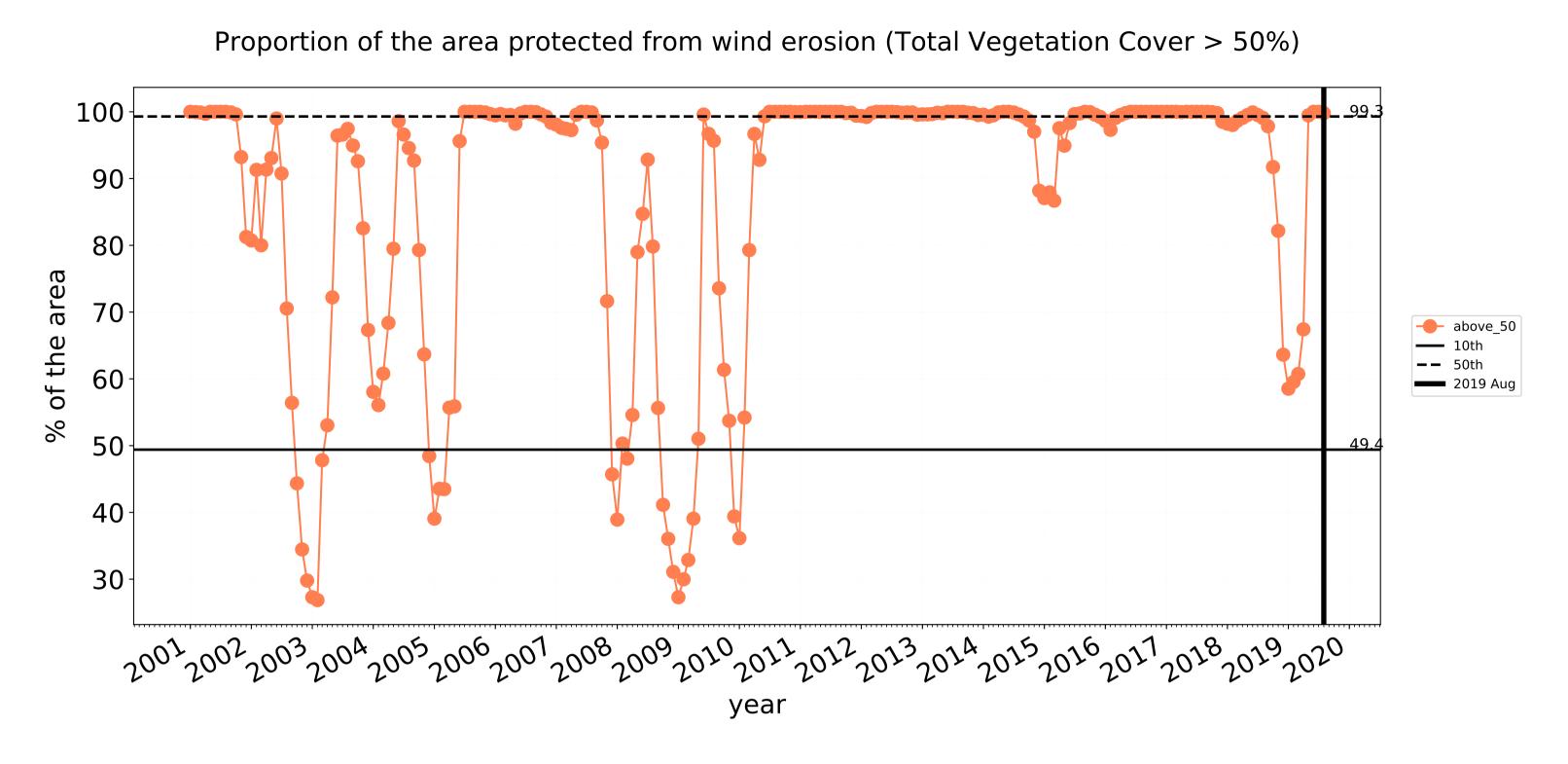


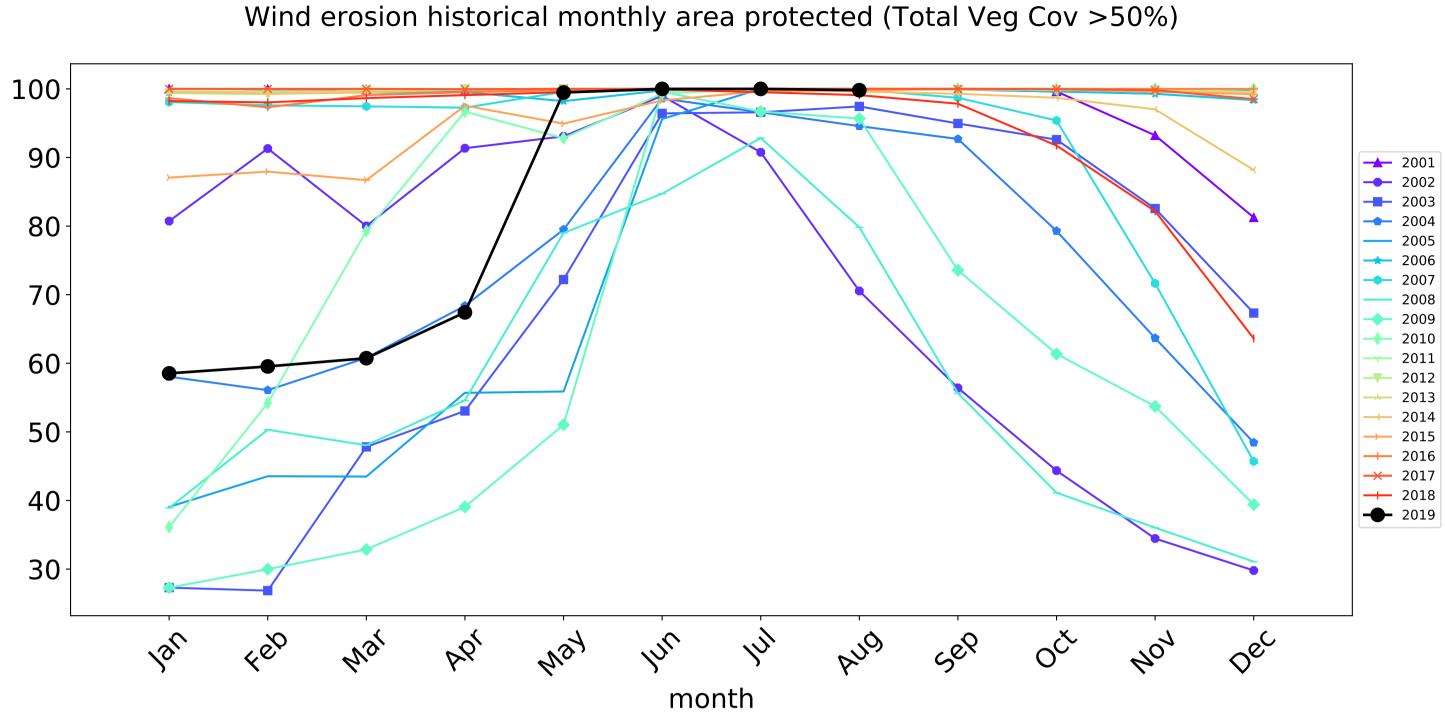


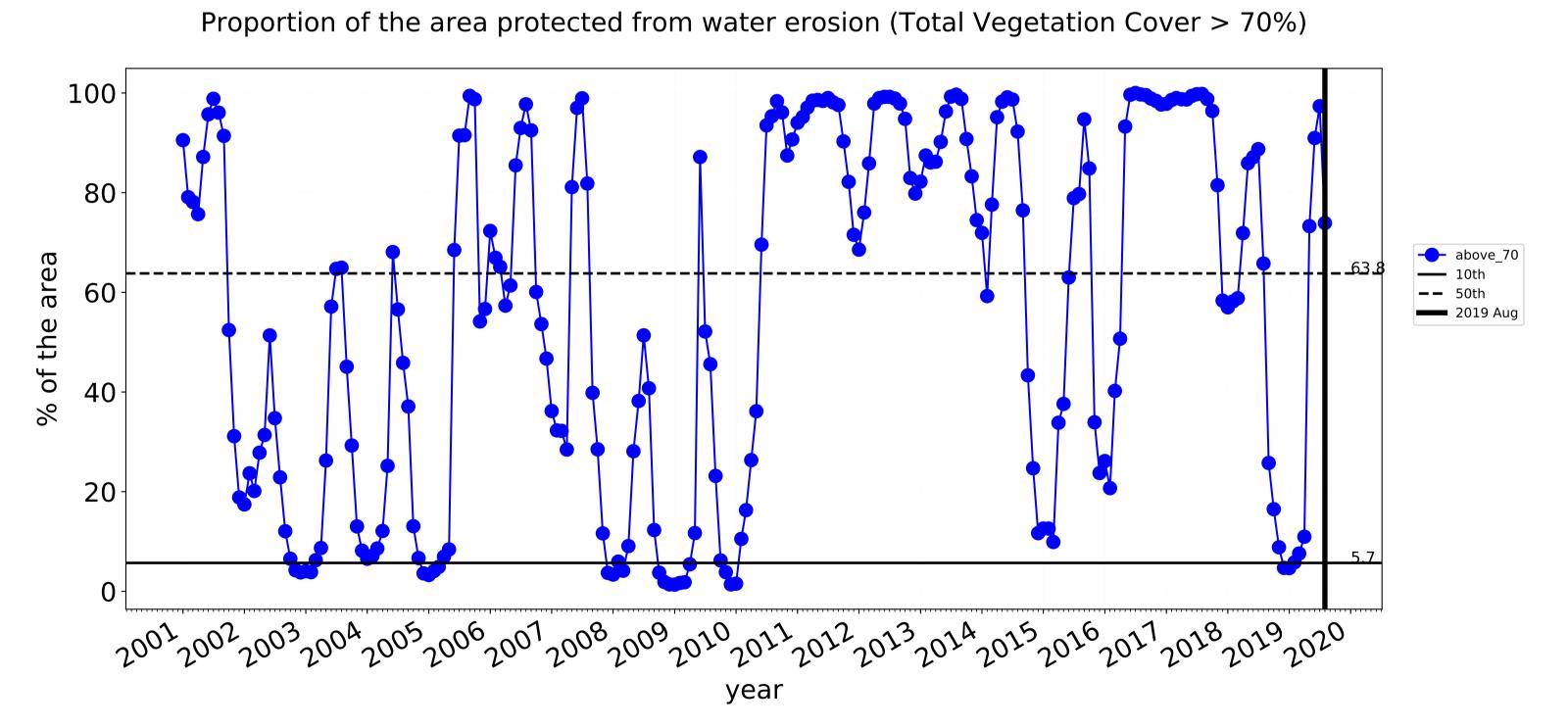


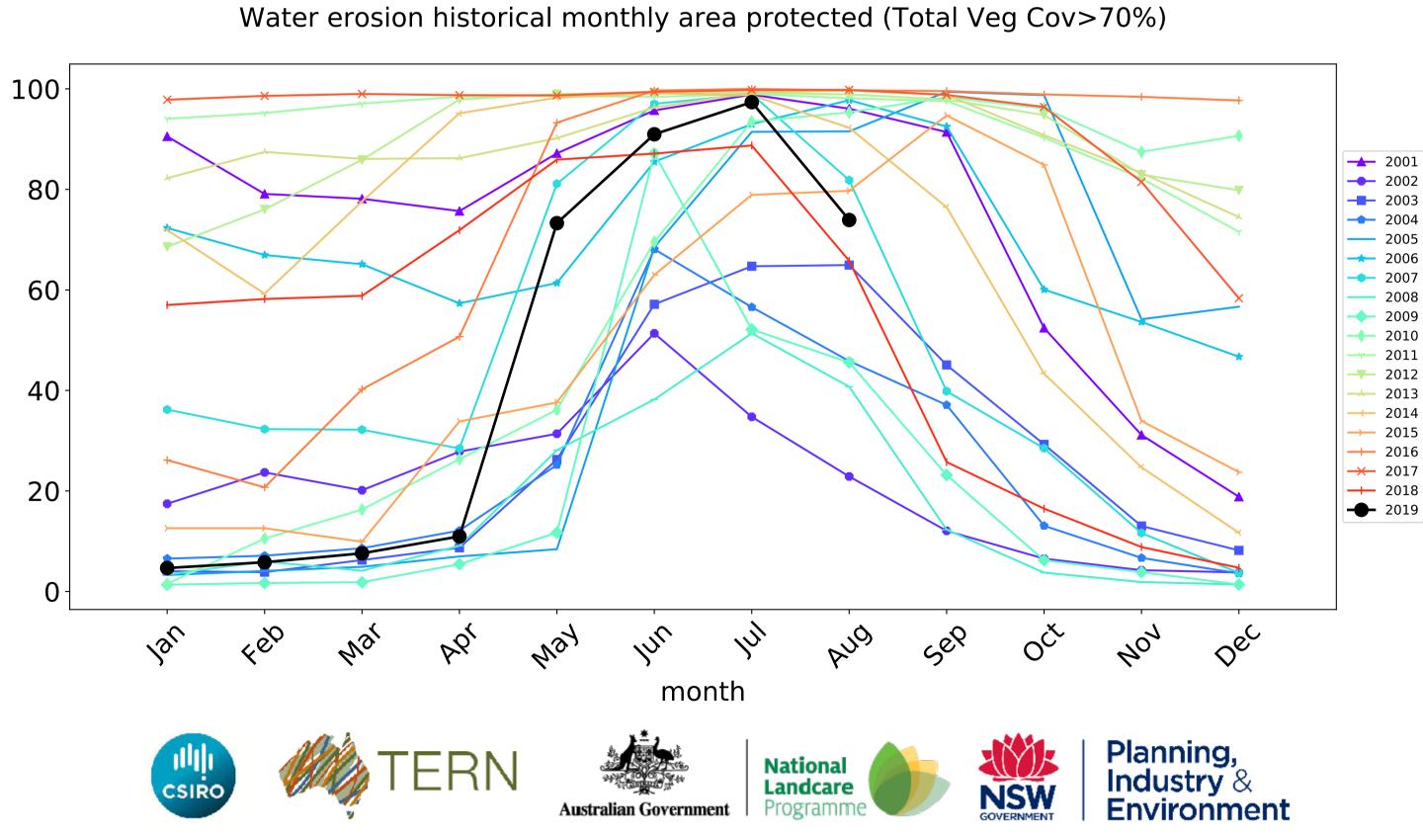


### **Conservation and natural environments non forest timeseries**









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

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

pixel is from

is, red pixels are about 20% lower than the

mean of that pixel. The mean

is only for the month of the map

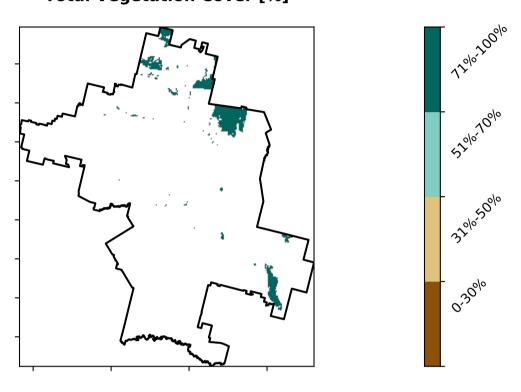
using baseline from 2001 to 2019.

the mean. That

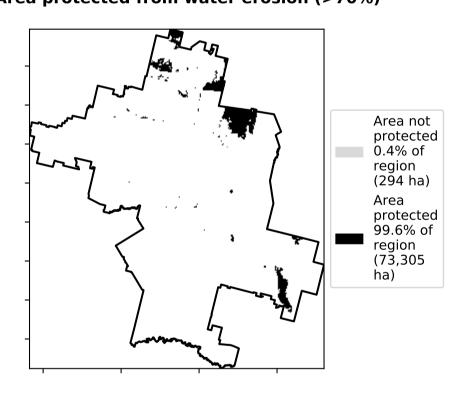
# Conservation and natural environments – Woodland forest

### **Total Vegetation Cover [%]**

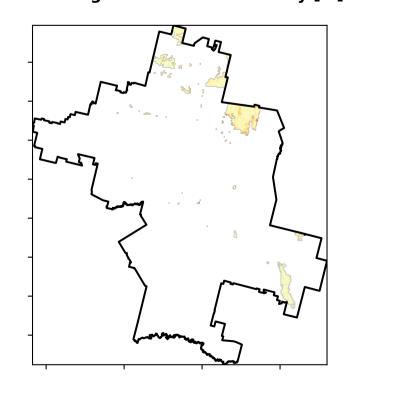
Land use and forest cover



### % Area protected from water erosion (>70%)

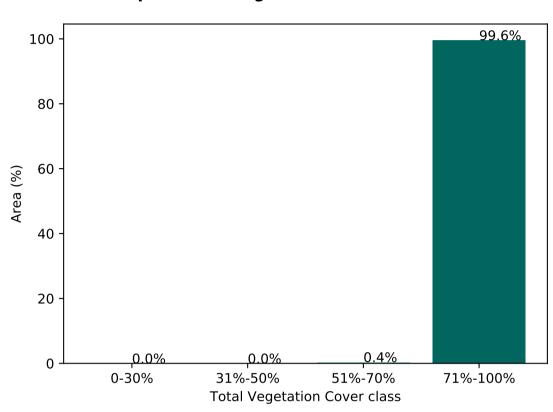


### Total Vegetation Cover Anomaly [%]

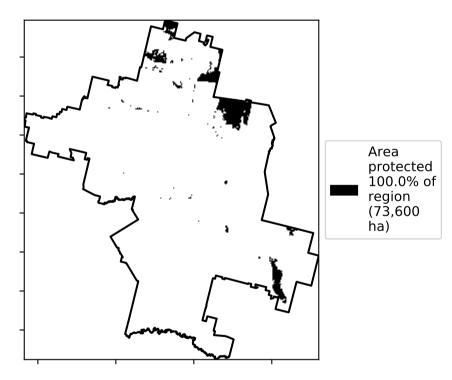


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### **Proportion of vegetation cover class in area**



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



### Total Vegetation Cover Decile [%]















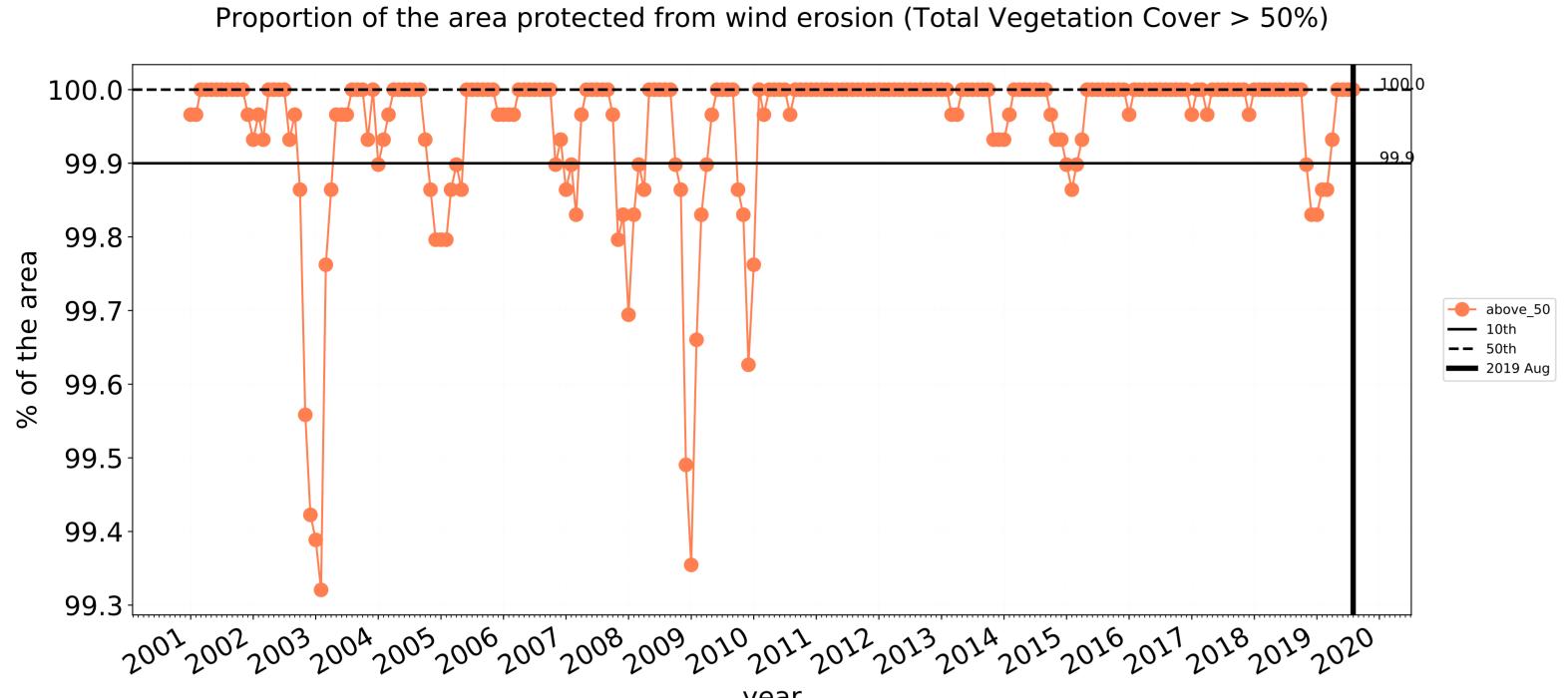
- 20

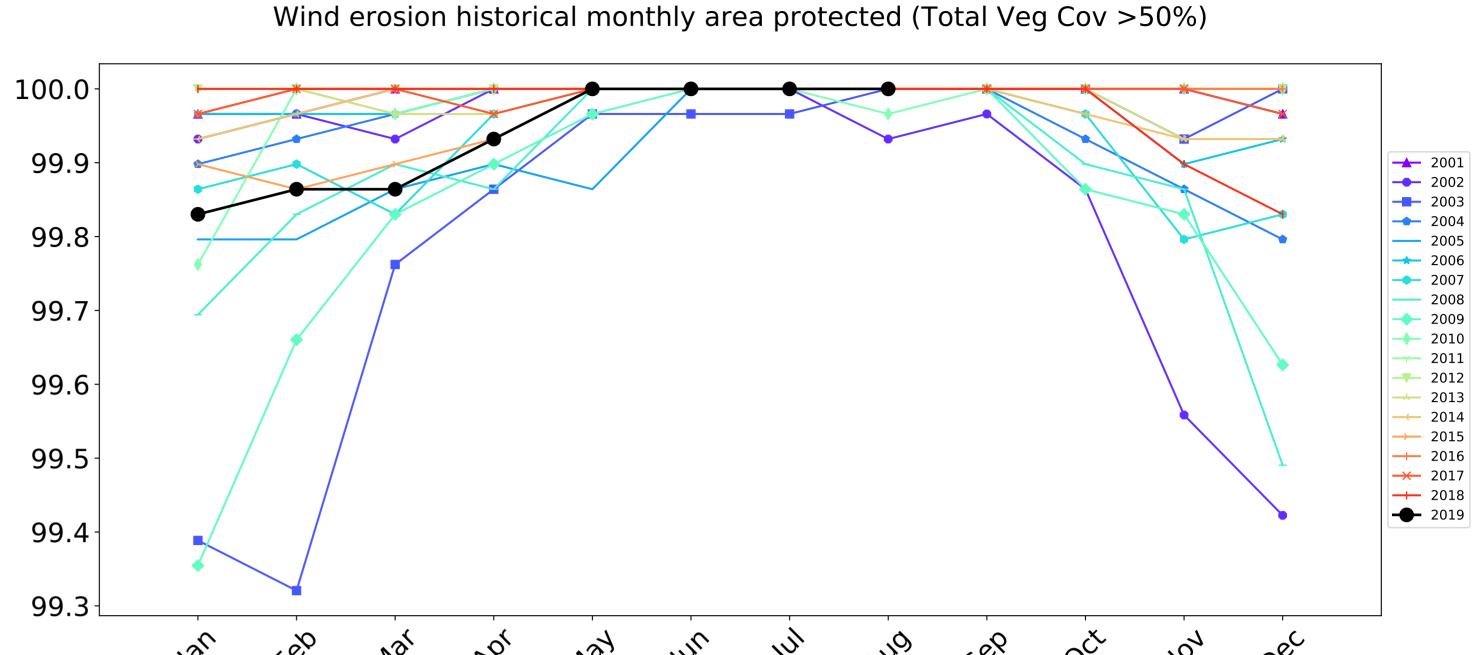
- 10

0

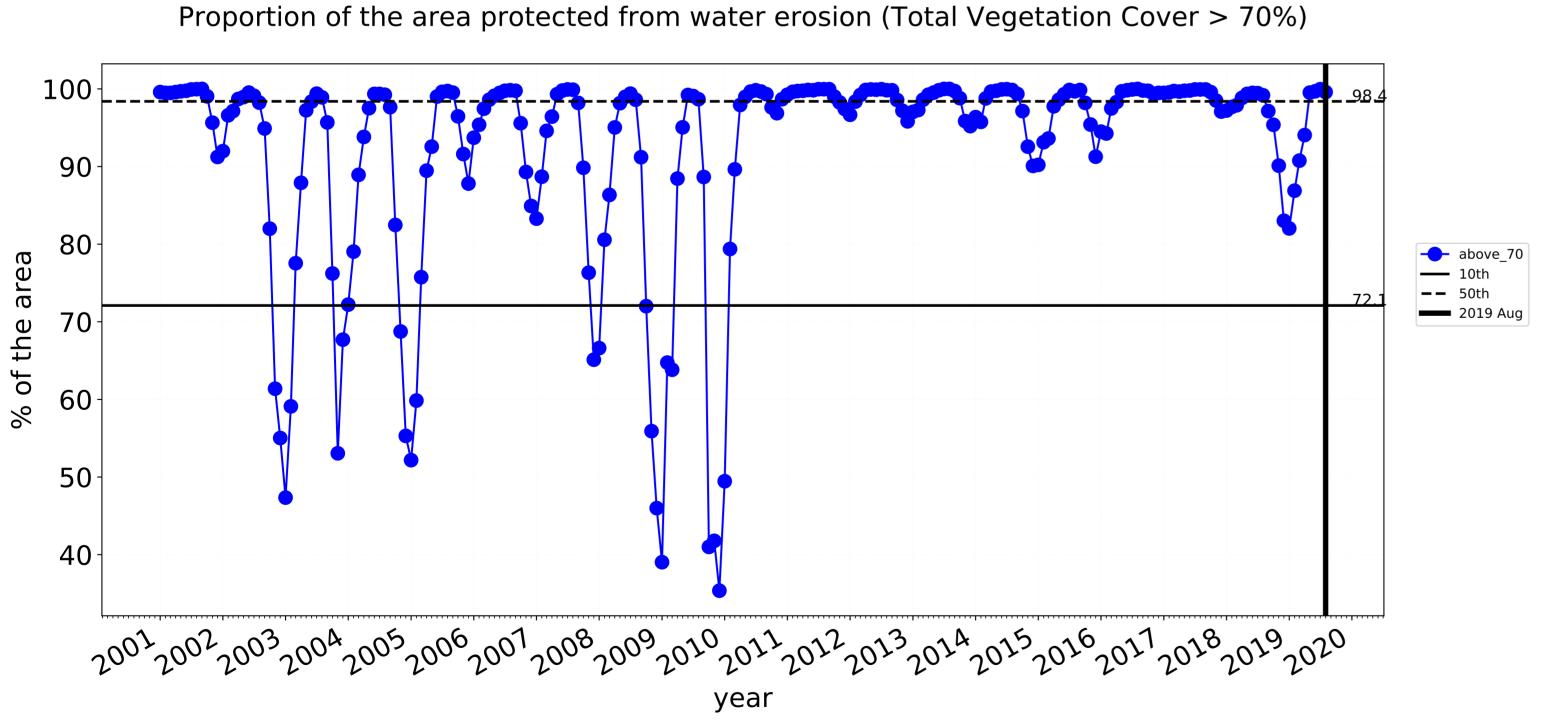
-10

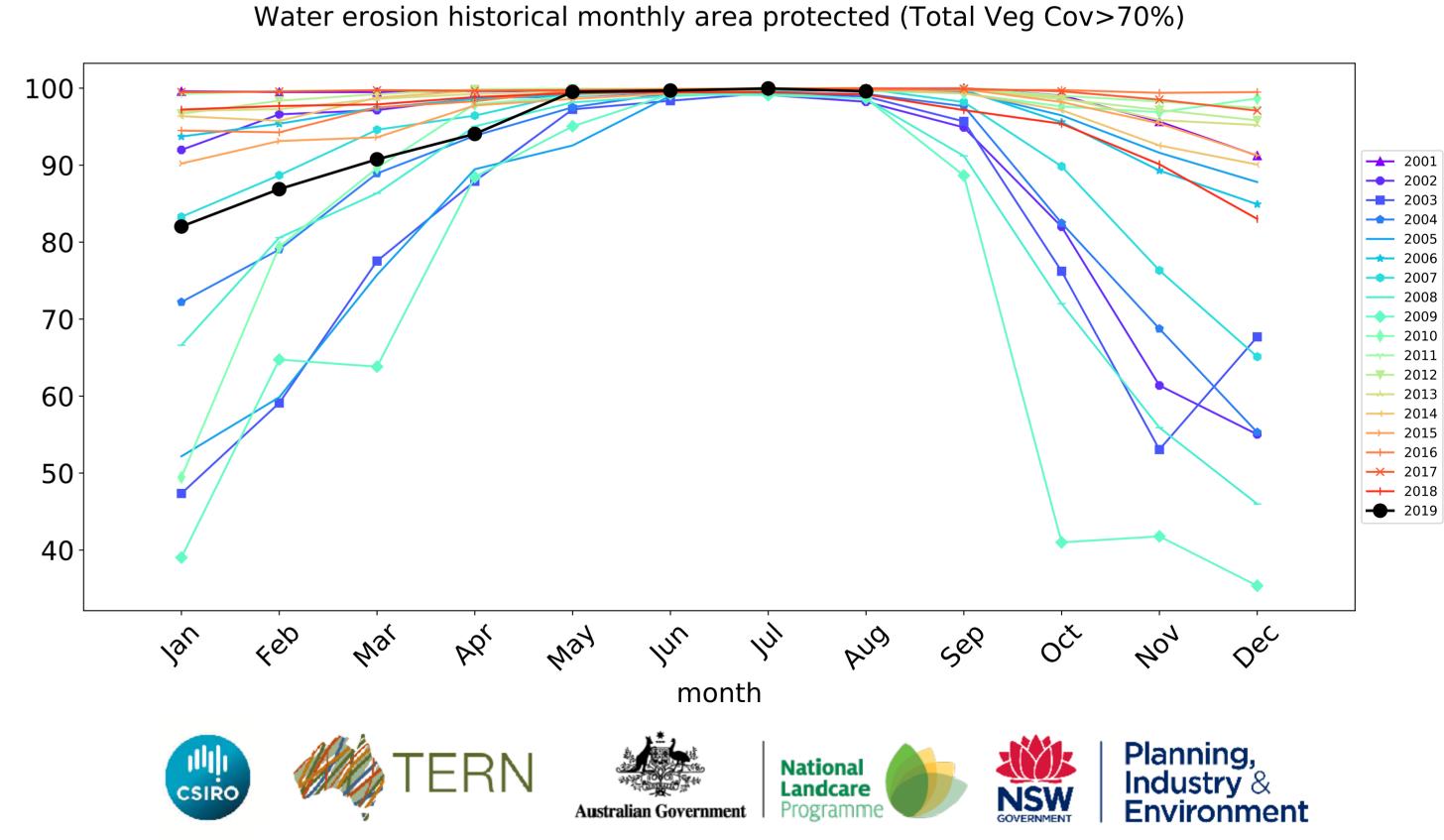
**-**20





month





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

Land use and forest cover

### Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

pixel is from

is, red pixels are about 20% lower than the mean of that

the mean. That

pixel. The mean

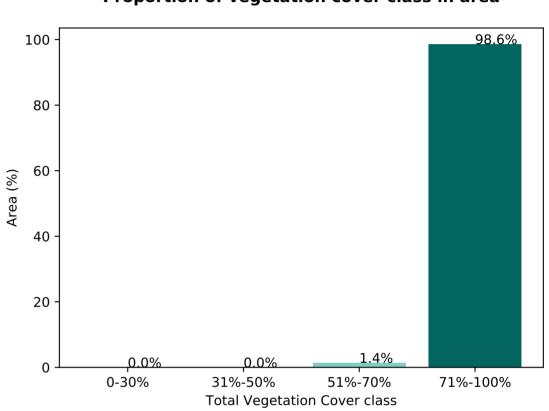
is only for the month of the map using baseline from 2001 to 2019.

## Conservation and natural environments - Non-woodland forest

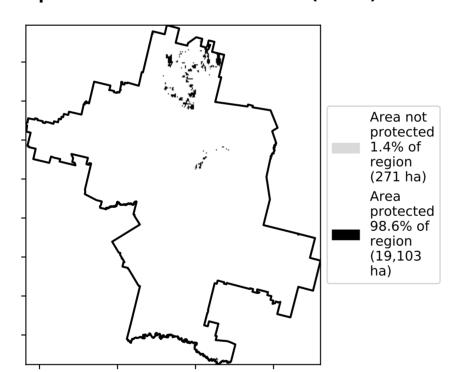
### **Total Vegetation Cover [%]**



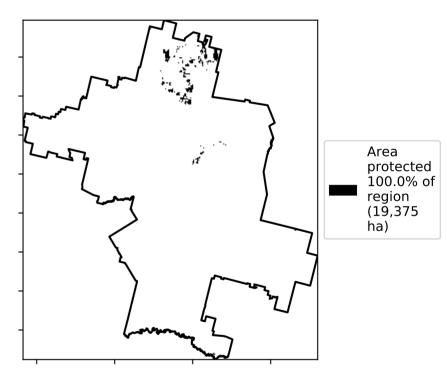
### Proportion of vegetation cover class in area



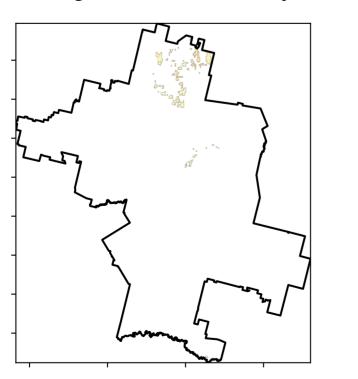
### % Area protected from water erosion (>70%)

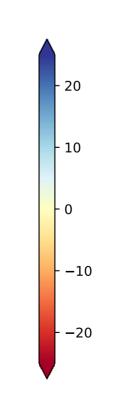


% Area protected from wind erosion (>50%)

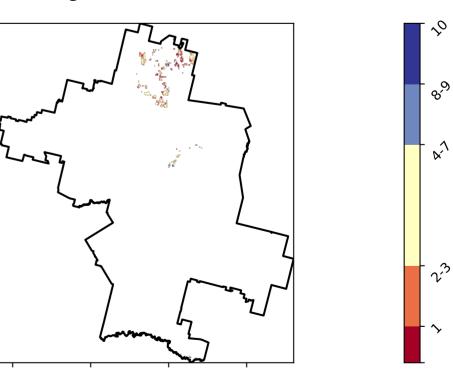


### **Total Vegetation Cover Anomaly [%]**





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.





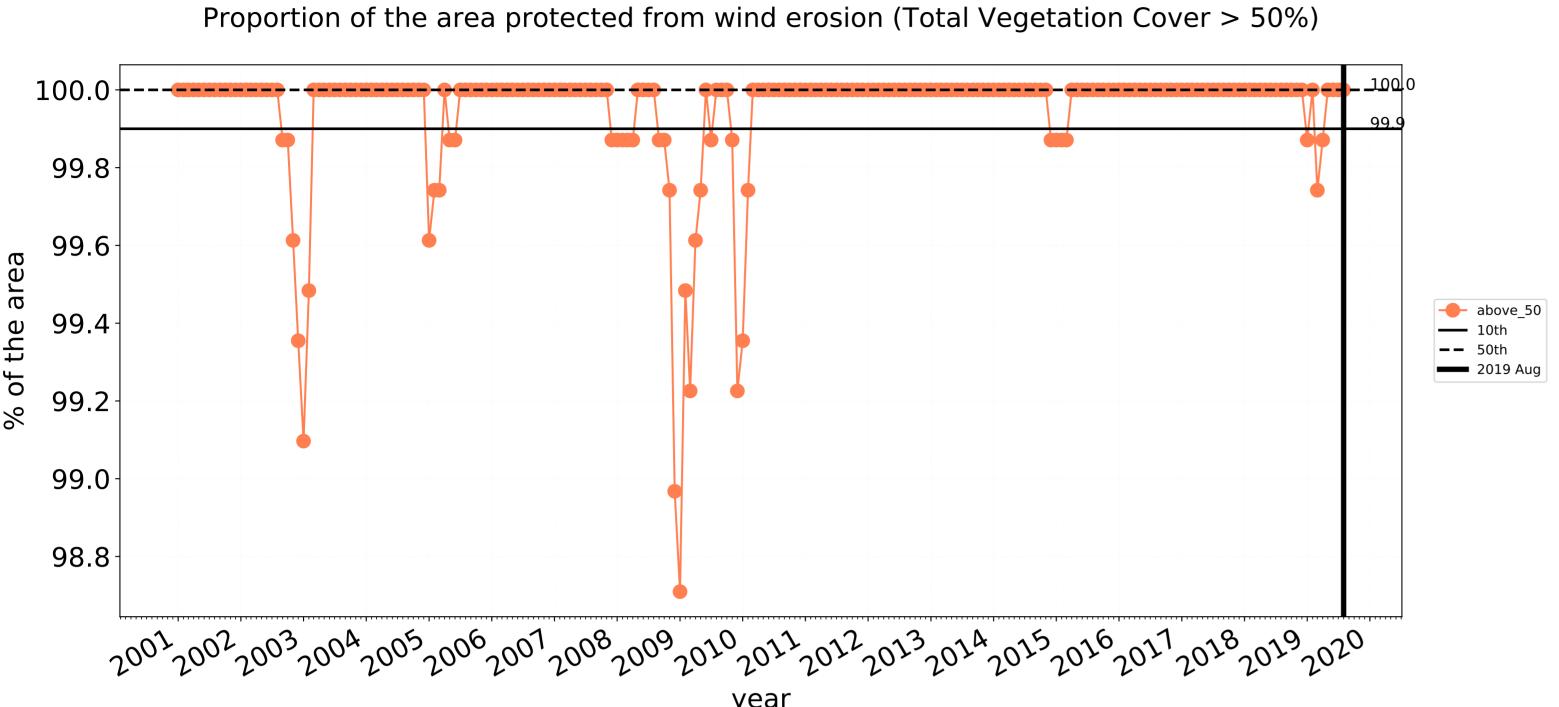


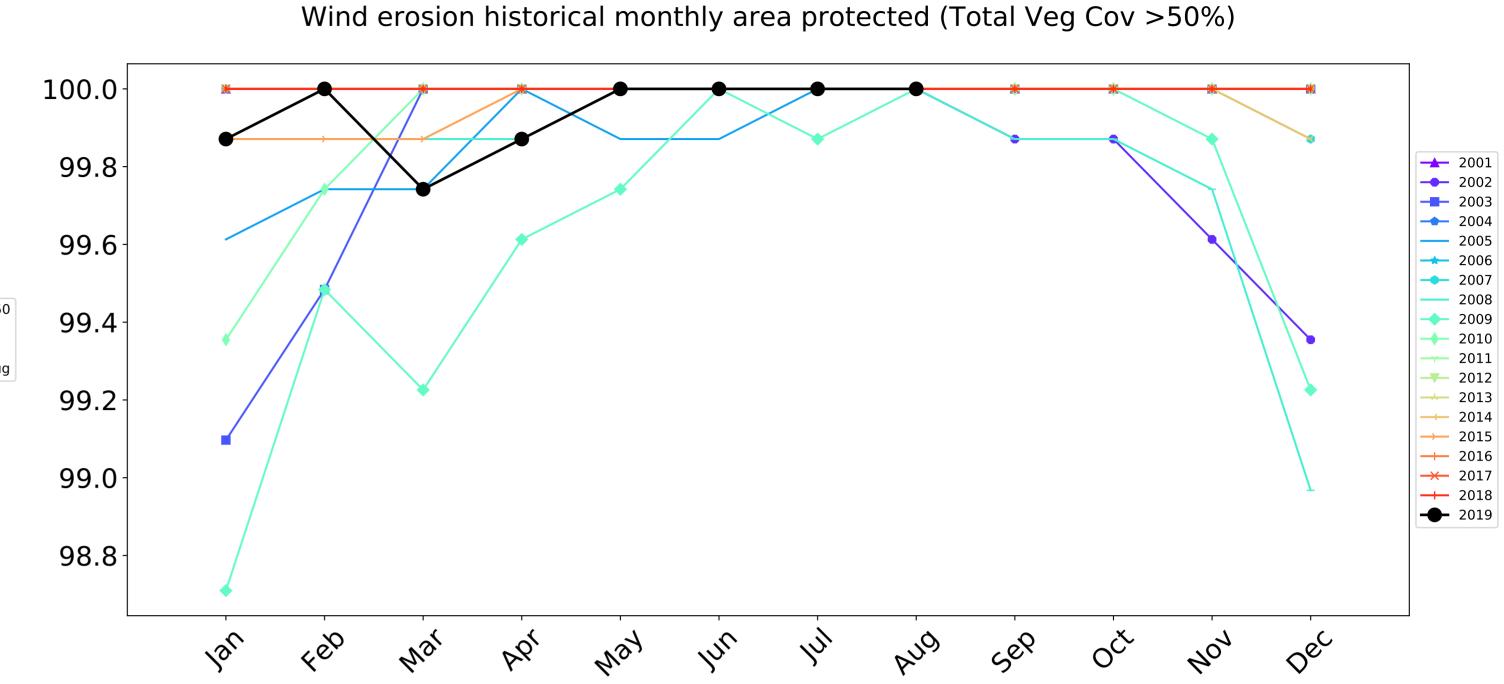




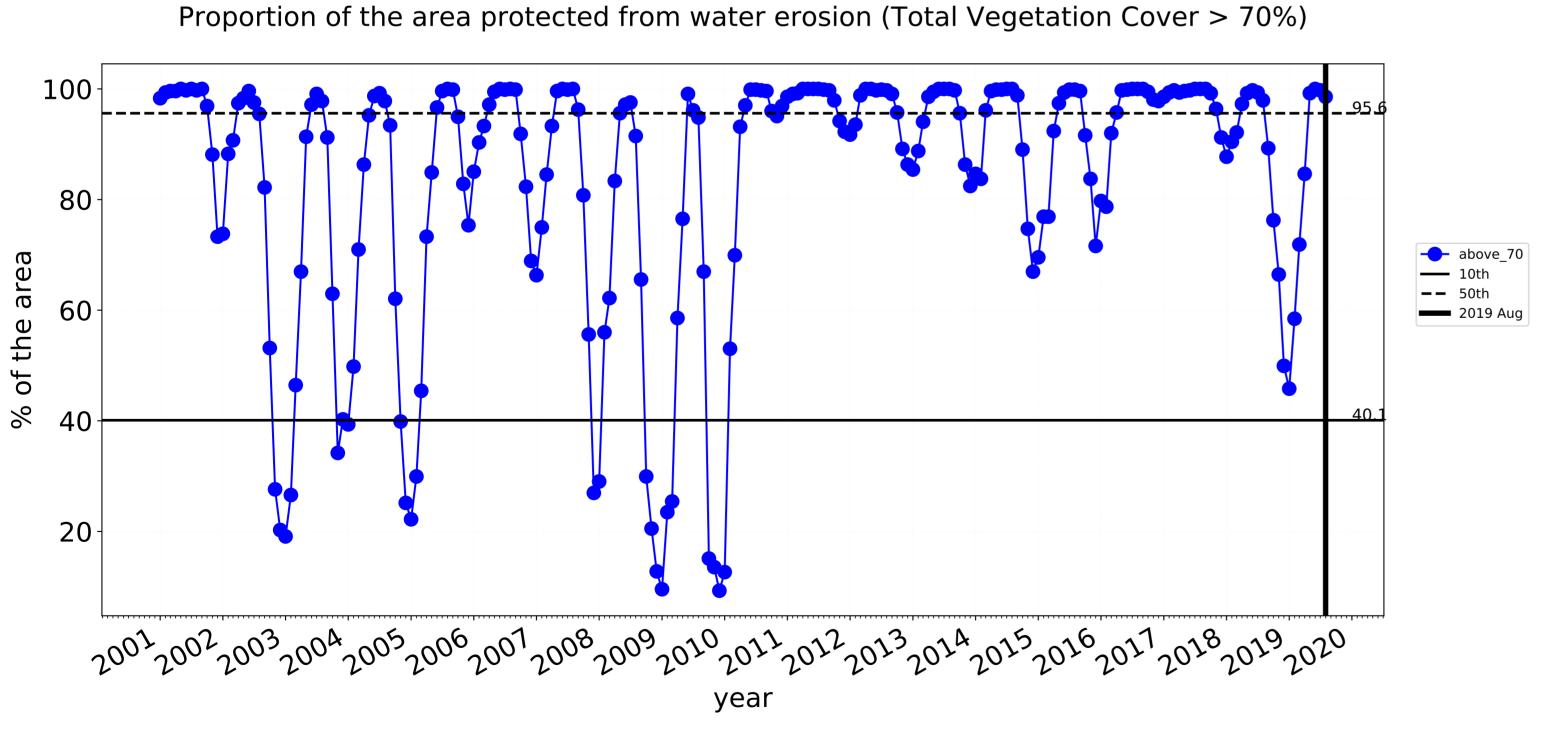


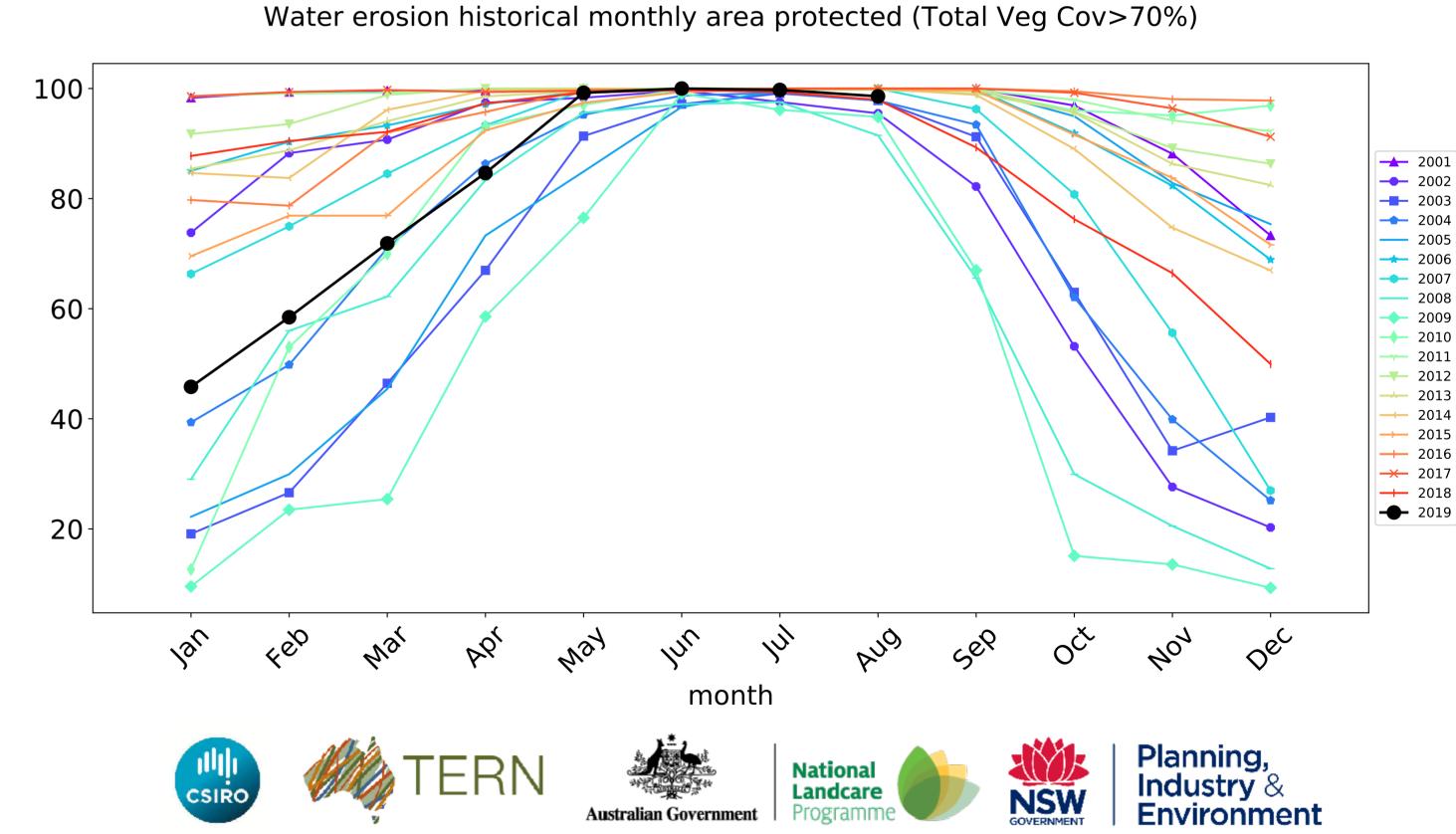






month





### **Agriculture**

### Land use and forest cover

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

pixel is from

is, red pixels are about 20% lower than the

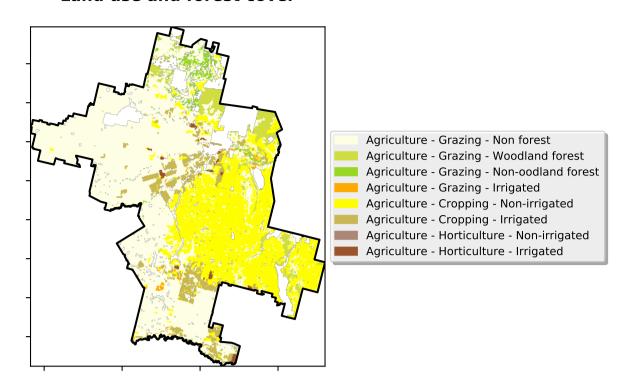
mean of that

pixel. The mean

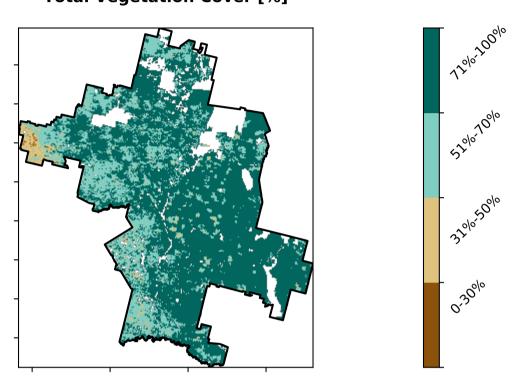
using baseline from 2001 to 2019.

is only for the month of the map

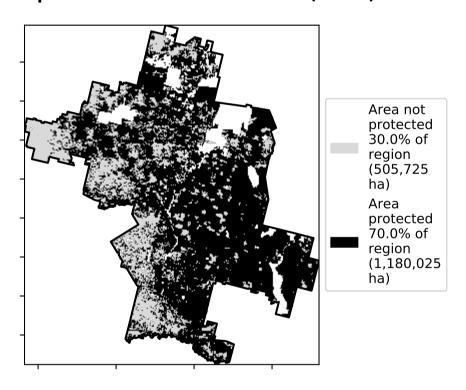
the mean. That



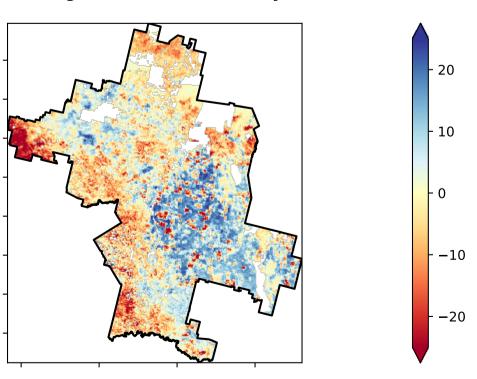
### **Total Vegetation Cover [%]**



### % Area protected from water erosion (>70%)

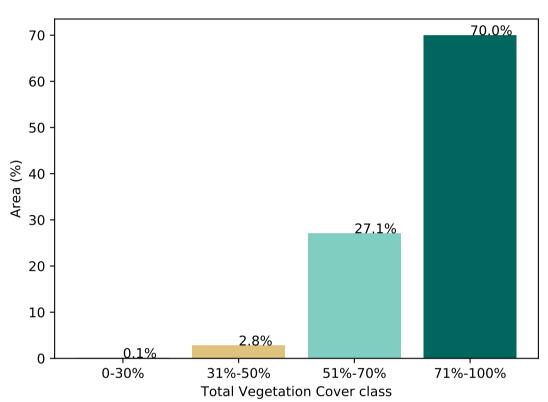


### **Total Vegetation Cover Anomaly [%]**

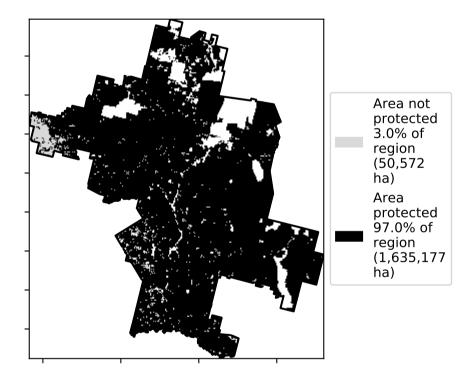


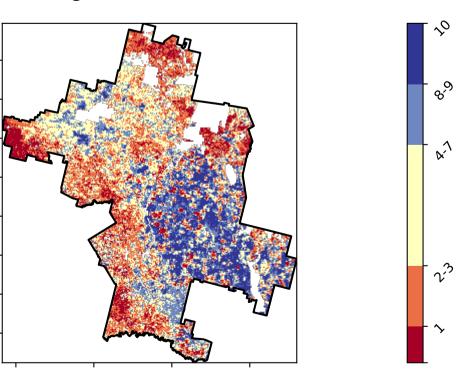
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### **Proportion of vegetation cover class in area**



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









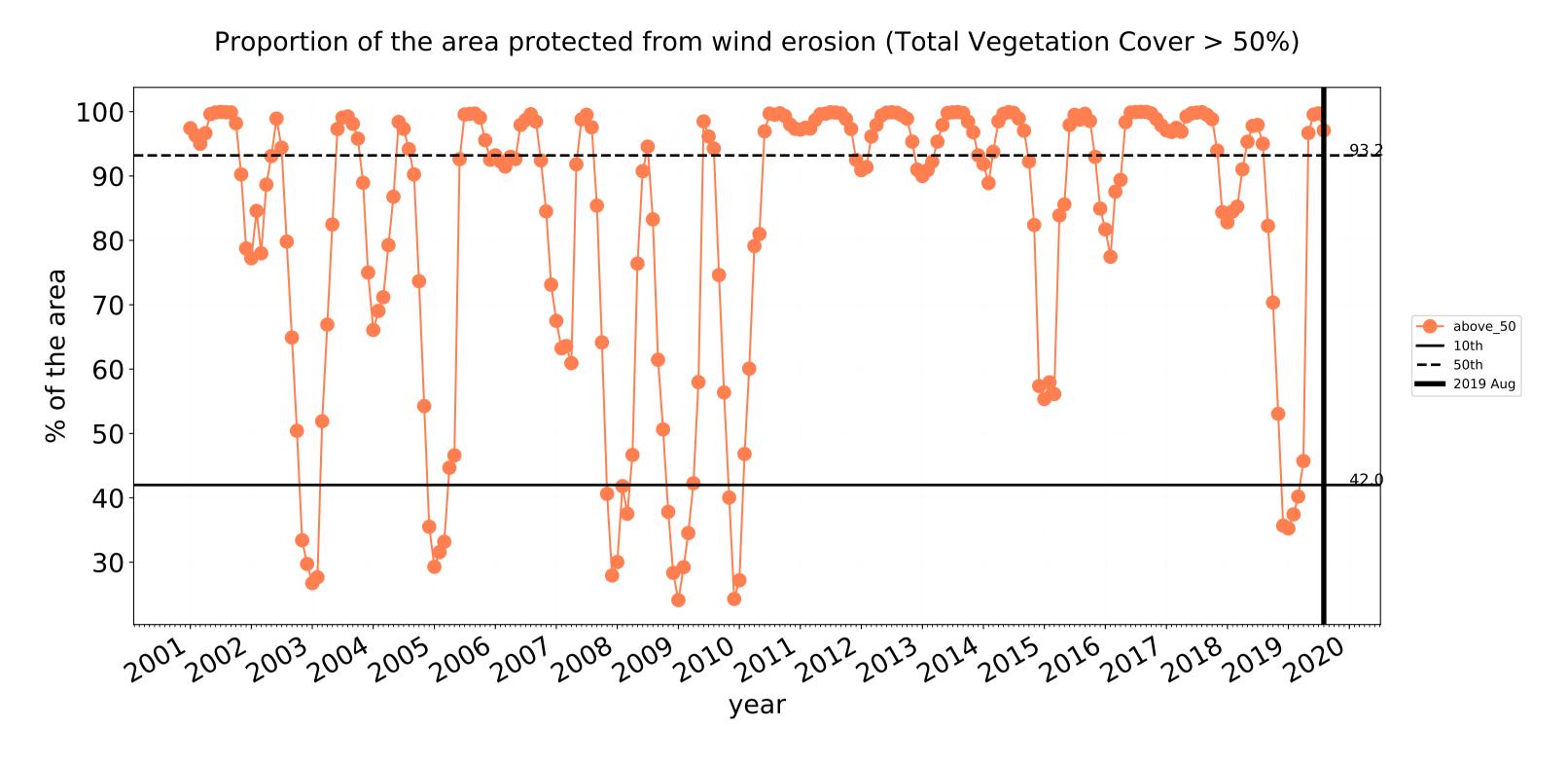


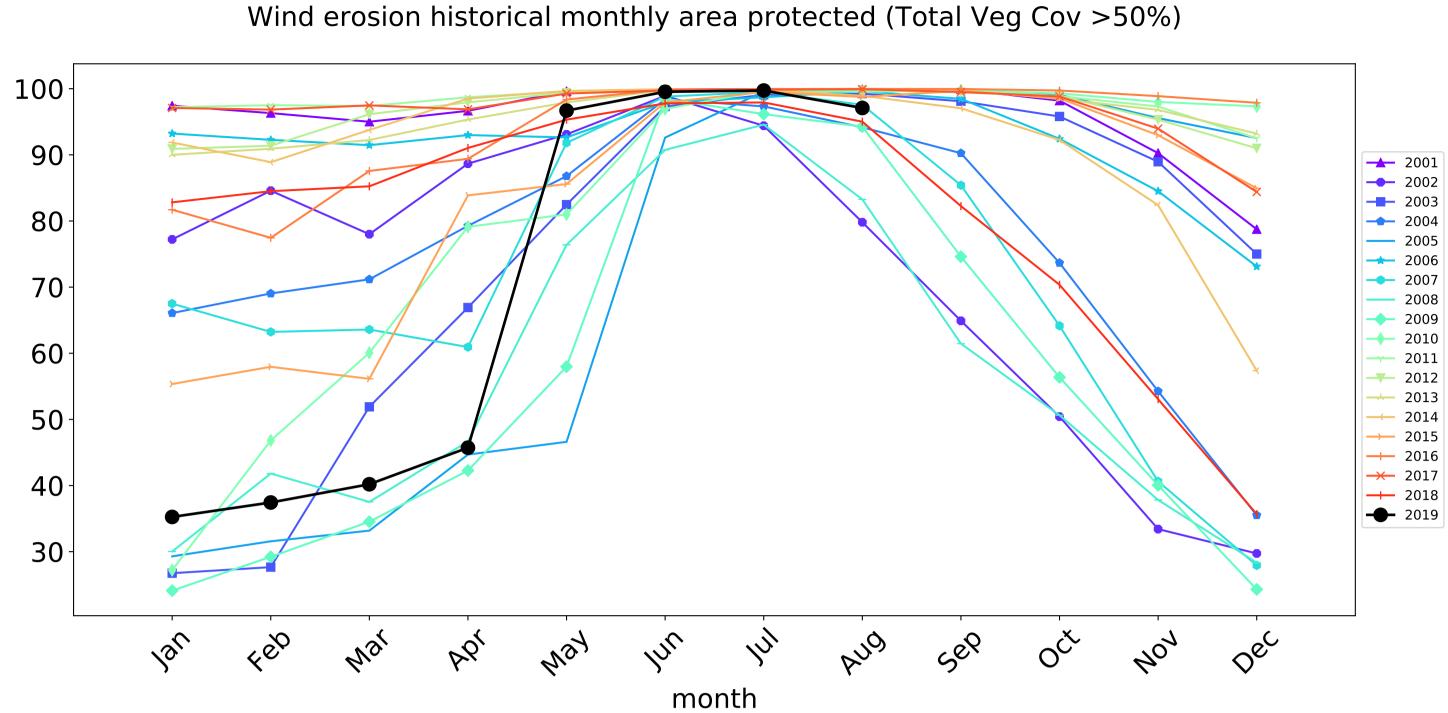


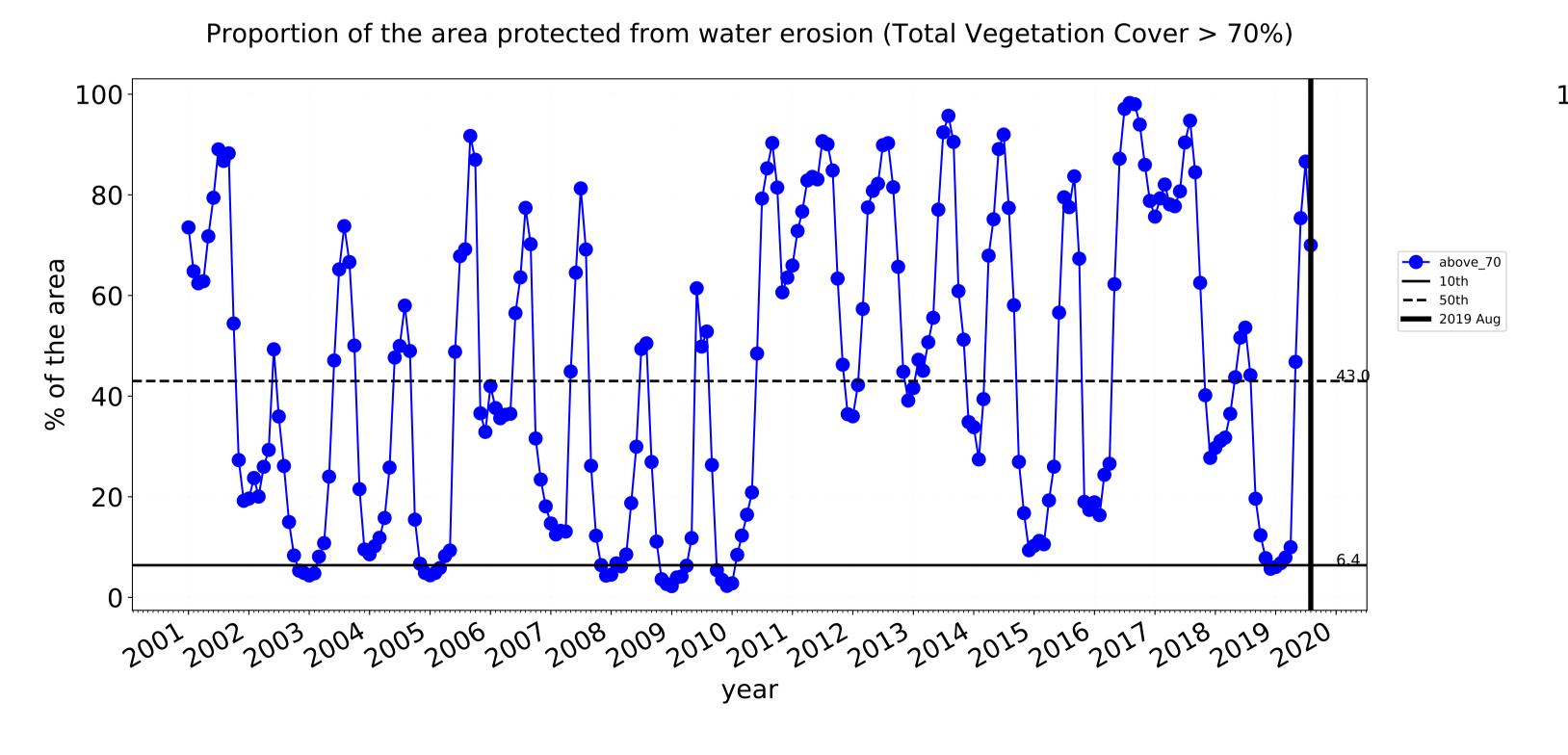


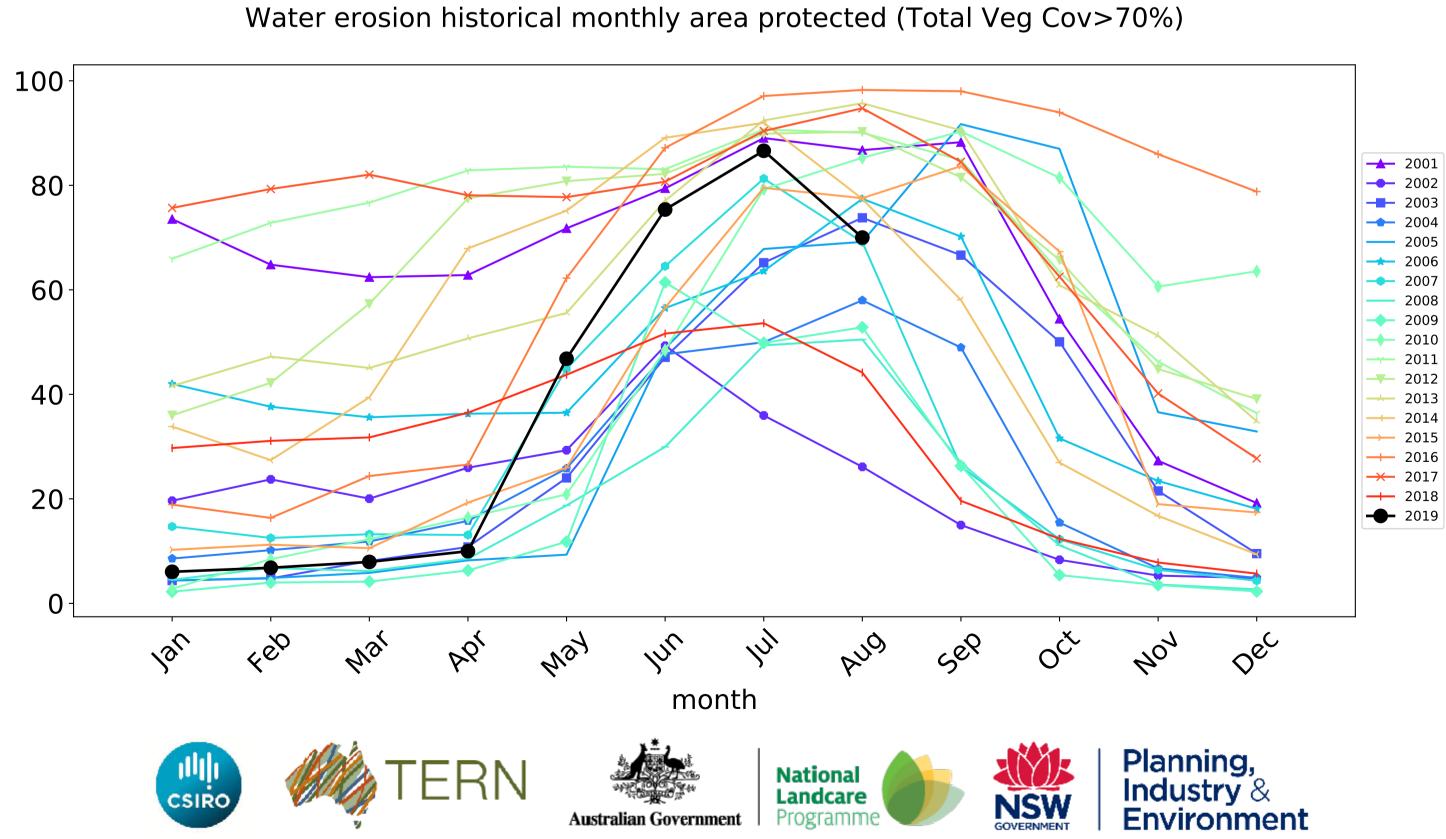


### **Agriculture timeseries**









### **Grazing**

### Land use and forest cover

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

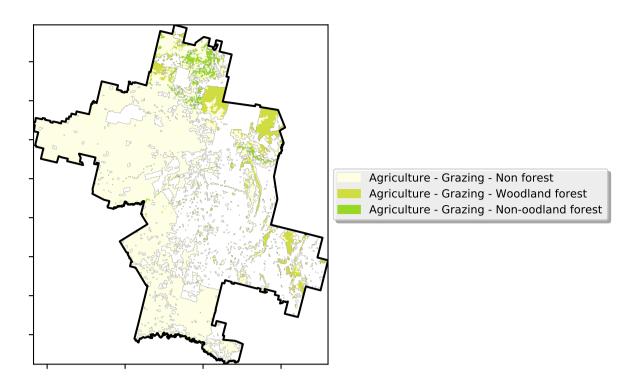
pixel is from the mean. That

is, red pixels are about 20% lower than the

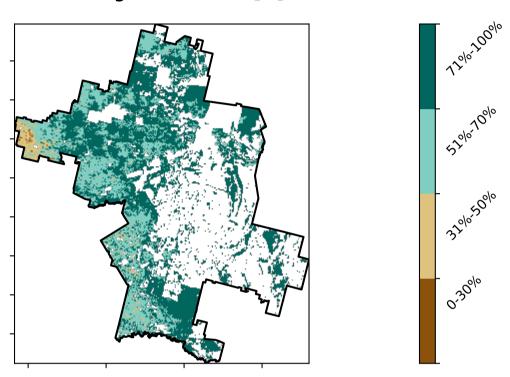
mean of that

using baseline from 2001 to 2019.

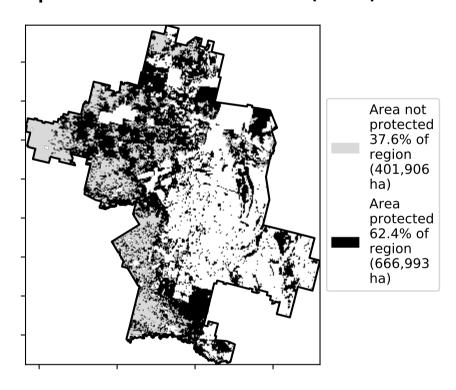
pixel. The mean is only for the month of the map



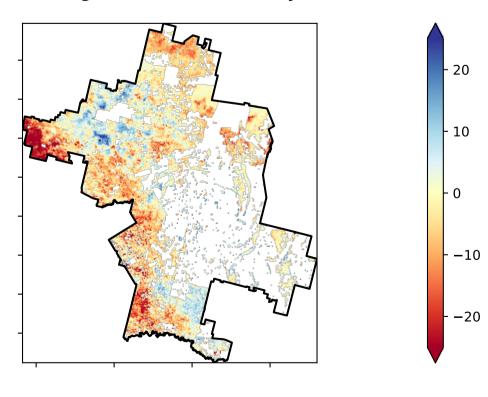
### **Total Vegetation Cover [%]**



### % Area protected from water erosion (>70%)

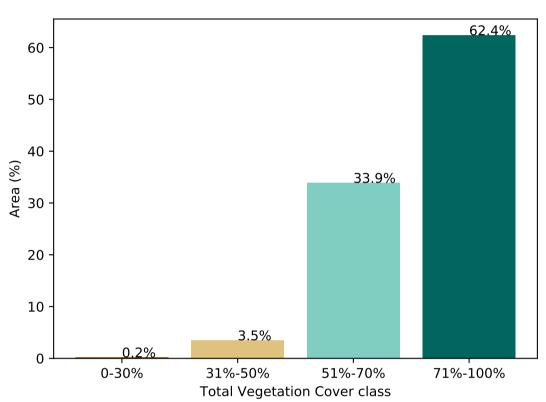


### **Total Vegetation Cover Anomaly [%]**

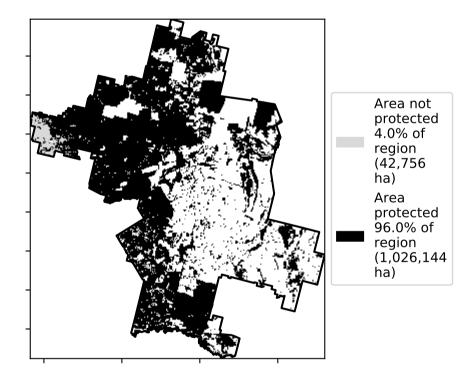


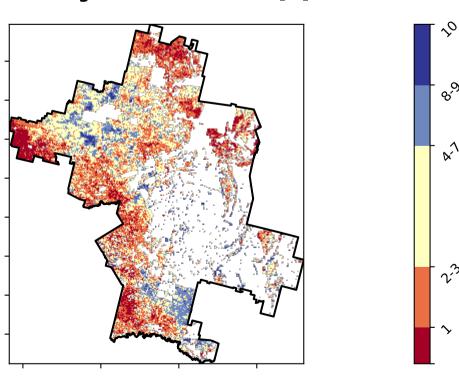
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### **Proportion of vegetation cover class in area**



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









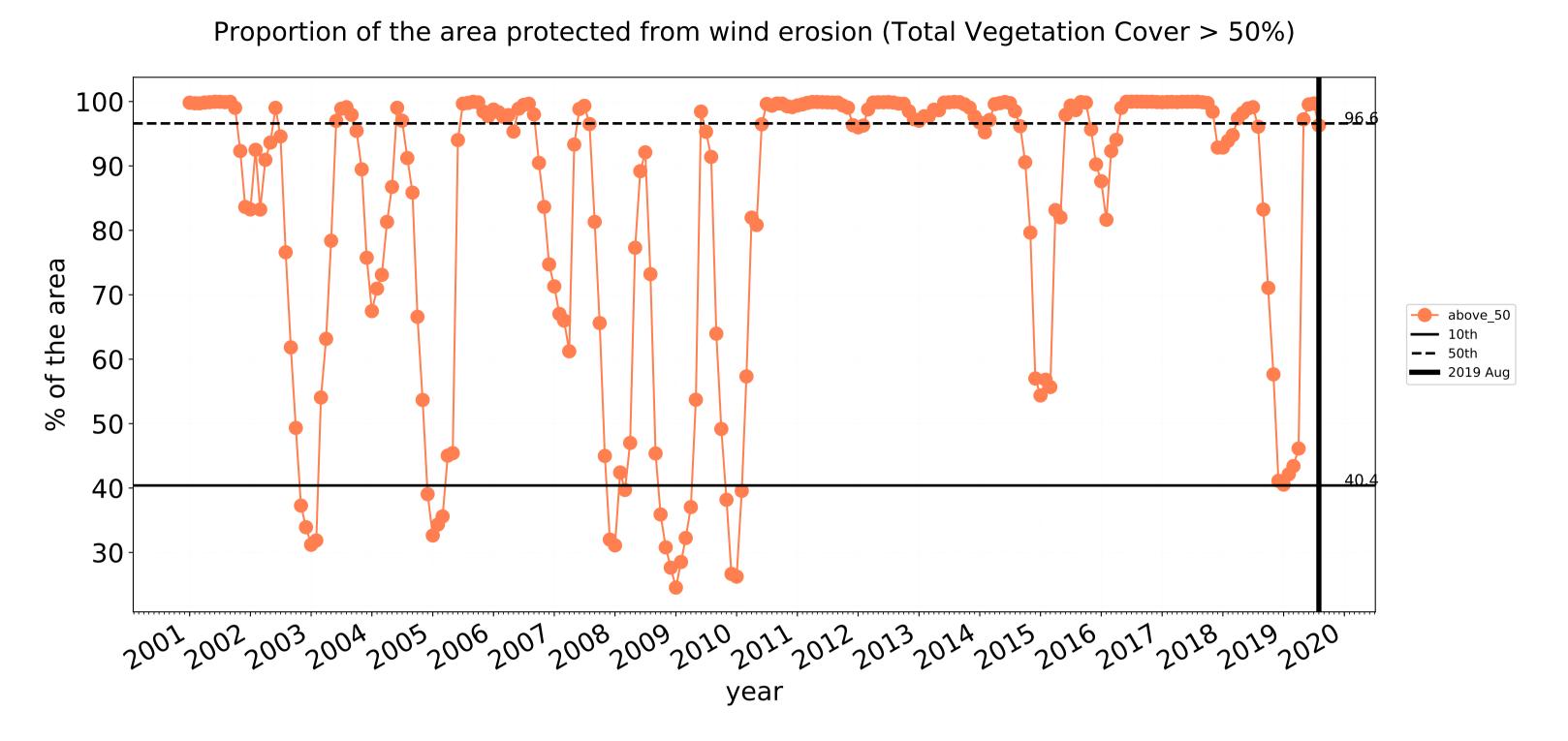


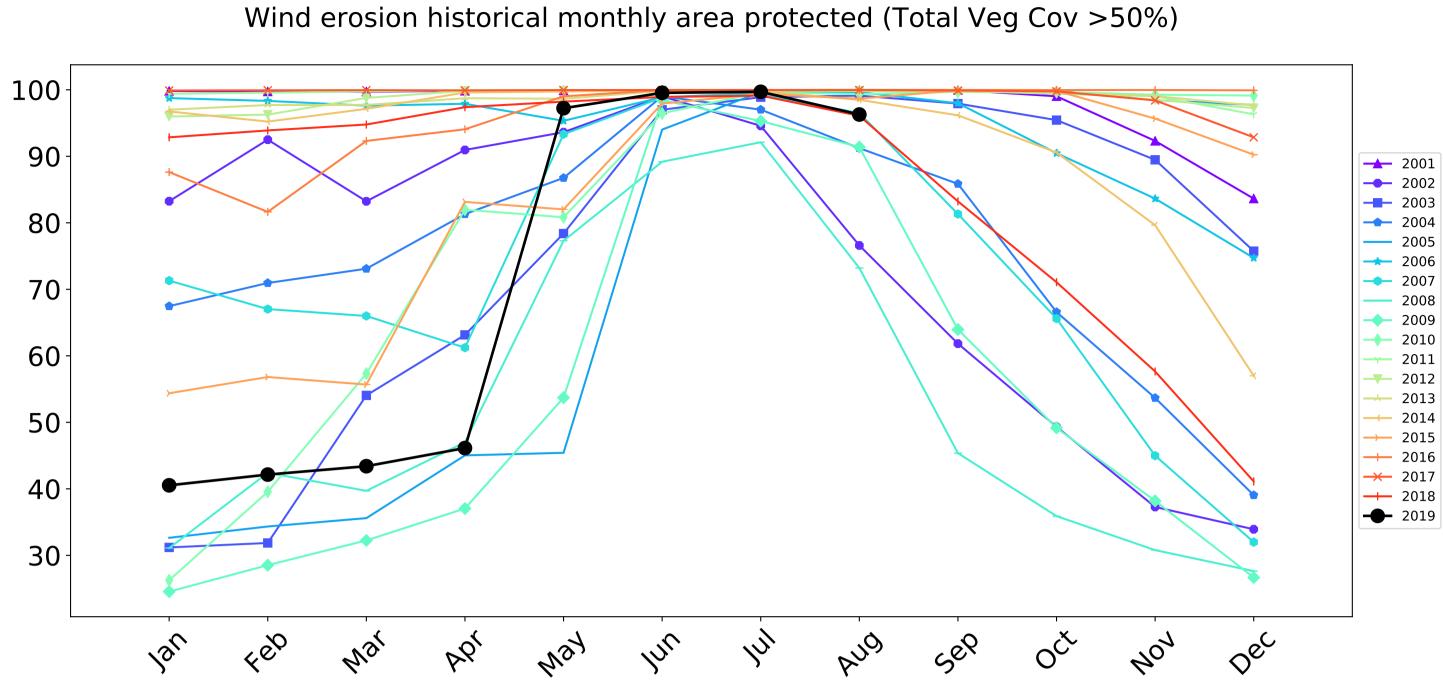




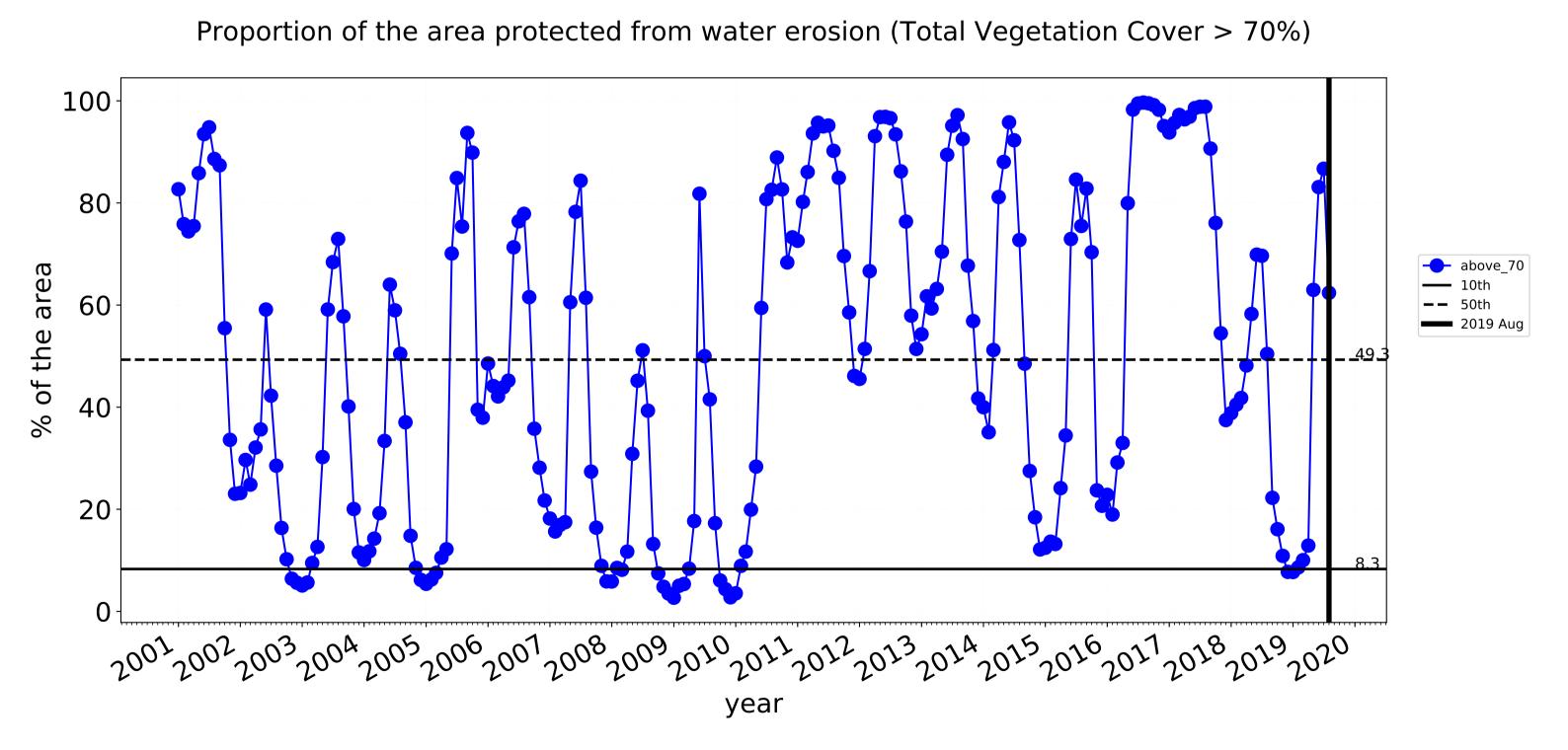


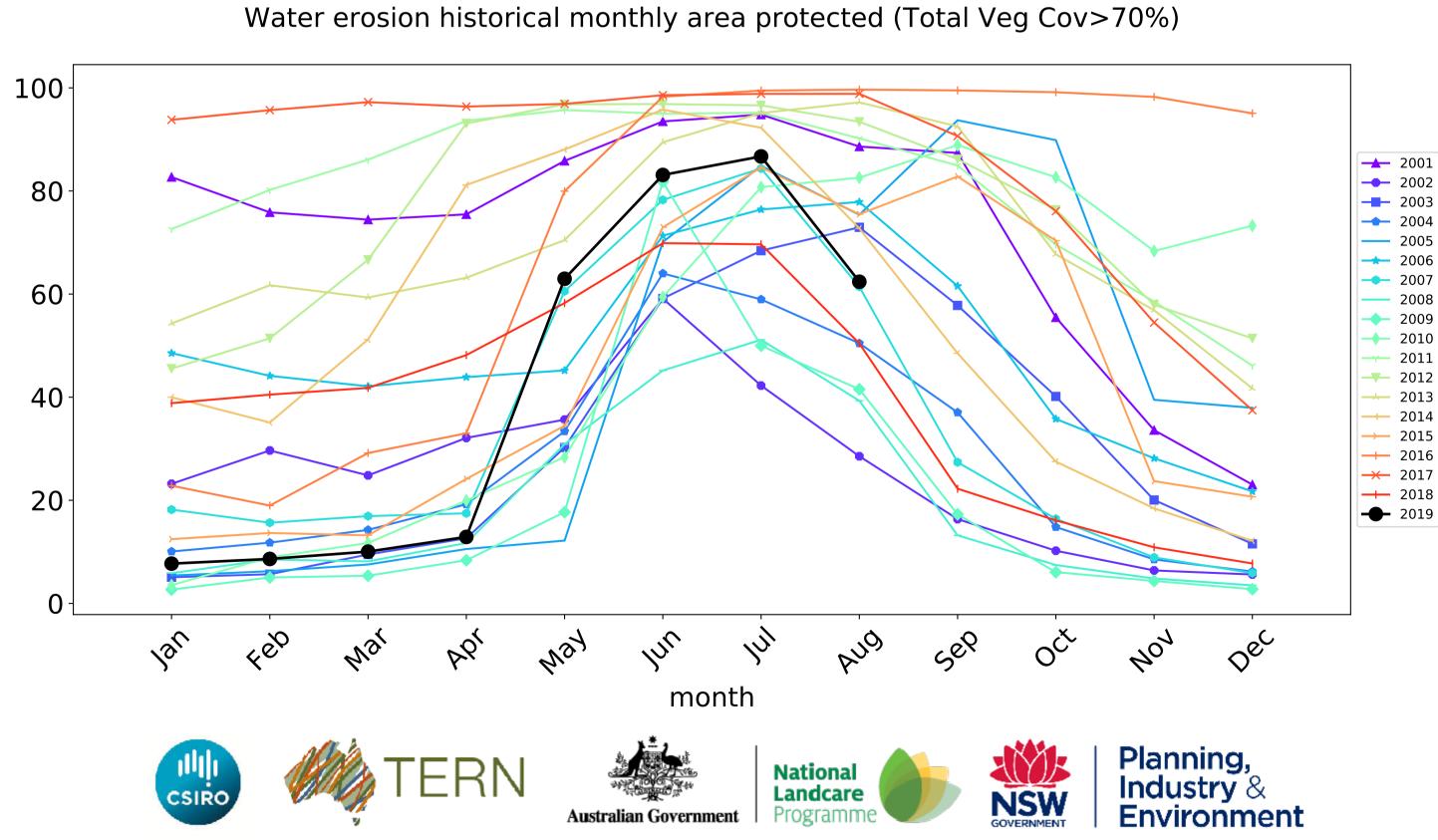
### **Grazing timeseries**





month





### **Grazing non forest**

### Land use and forest cover

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

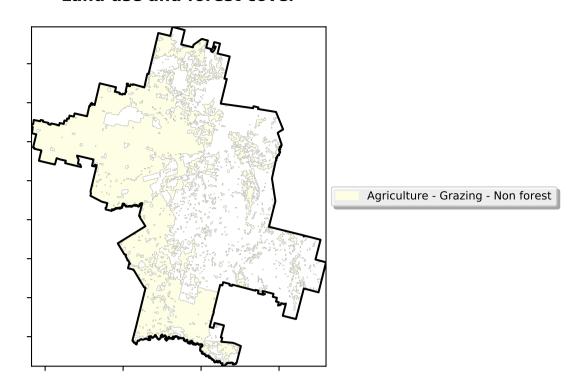
pixel is from

is, red pixels are about 20% lower than the

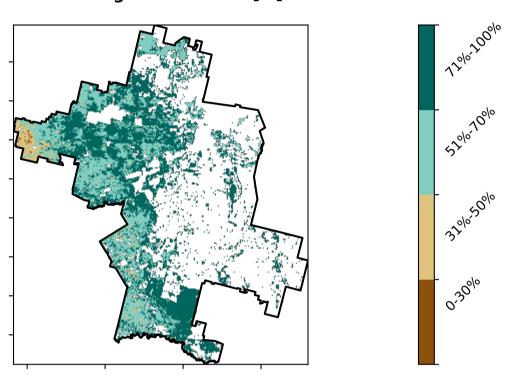
mean of that

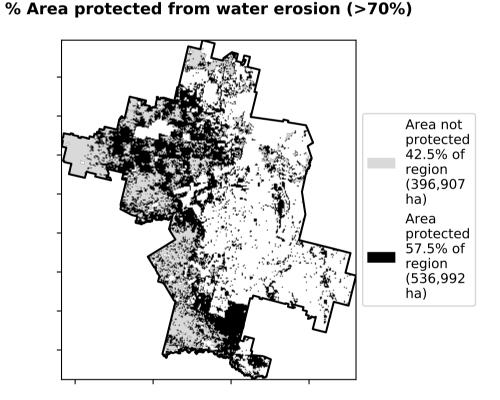
pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

the mean. That

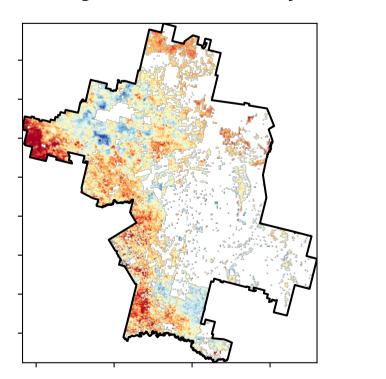


### **Total Vegetation Cover [%]**





### **Total Vegetation Cover Anomaly [%]**

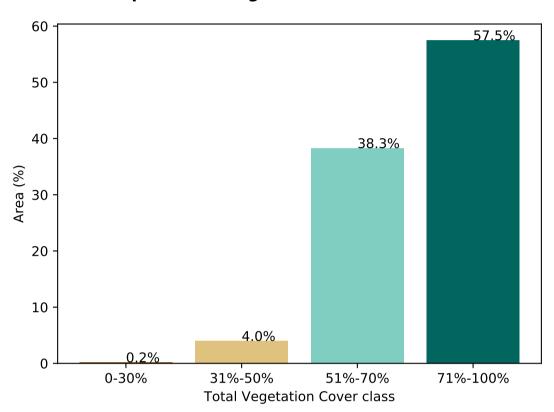


- 20 Deciles show where the pixel value lies in the - 10 record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019. -10

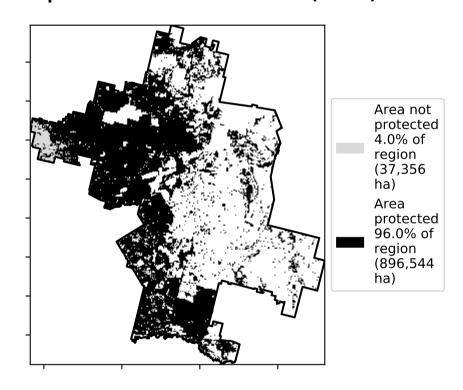
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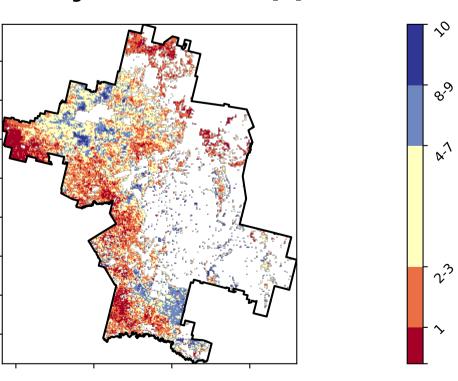
**-**20

### **Proportion of vegetation cover class in area**



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









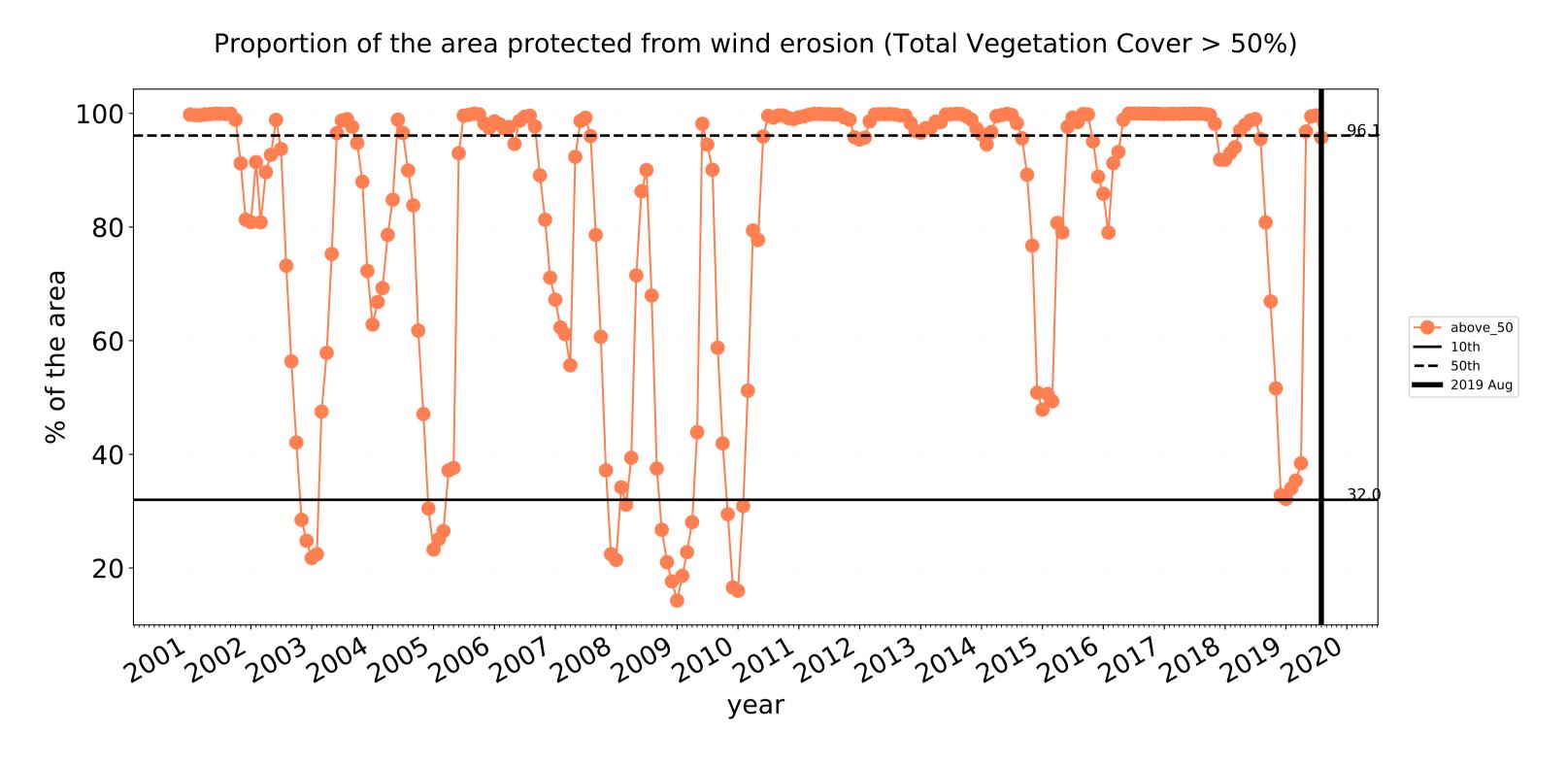


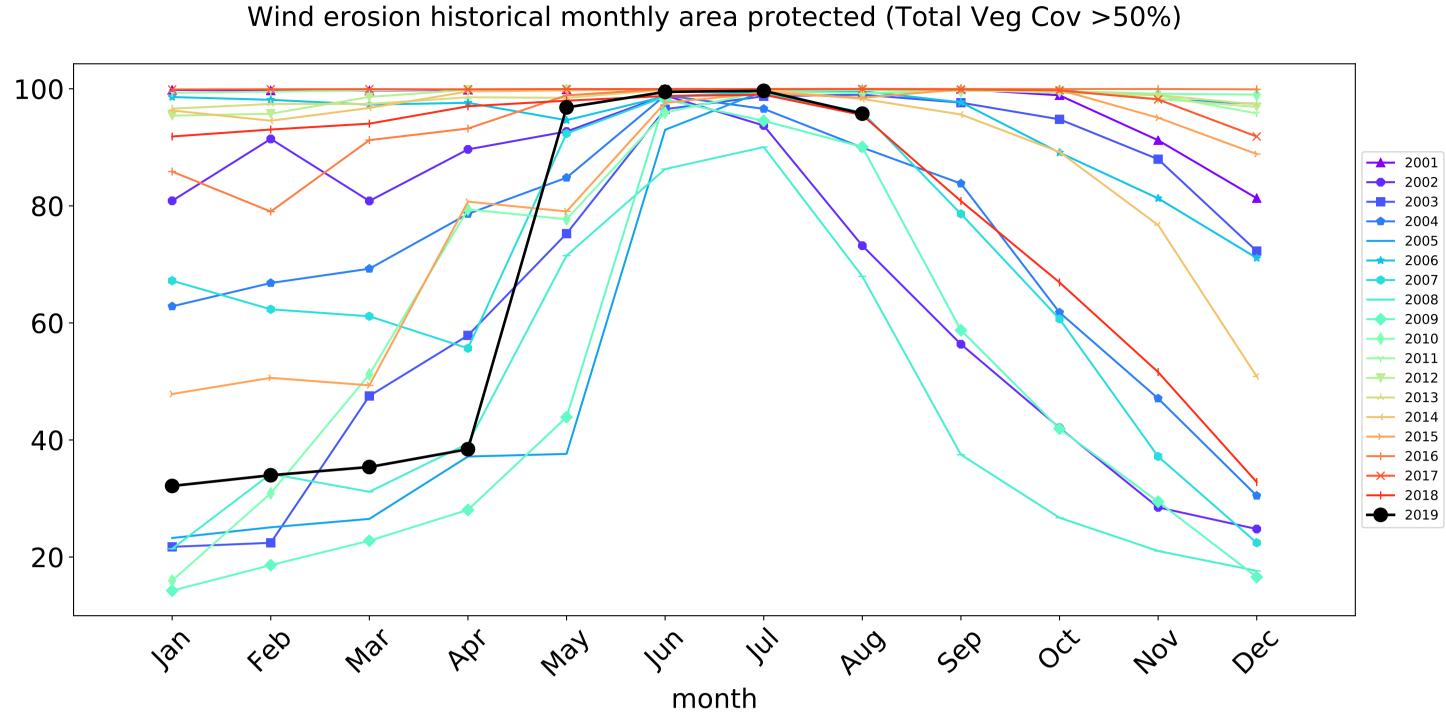


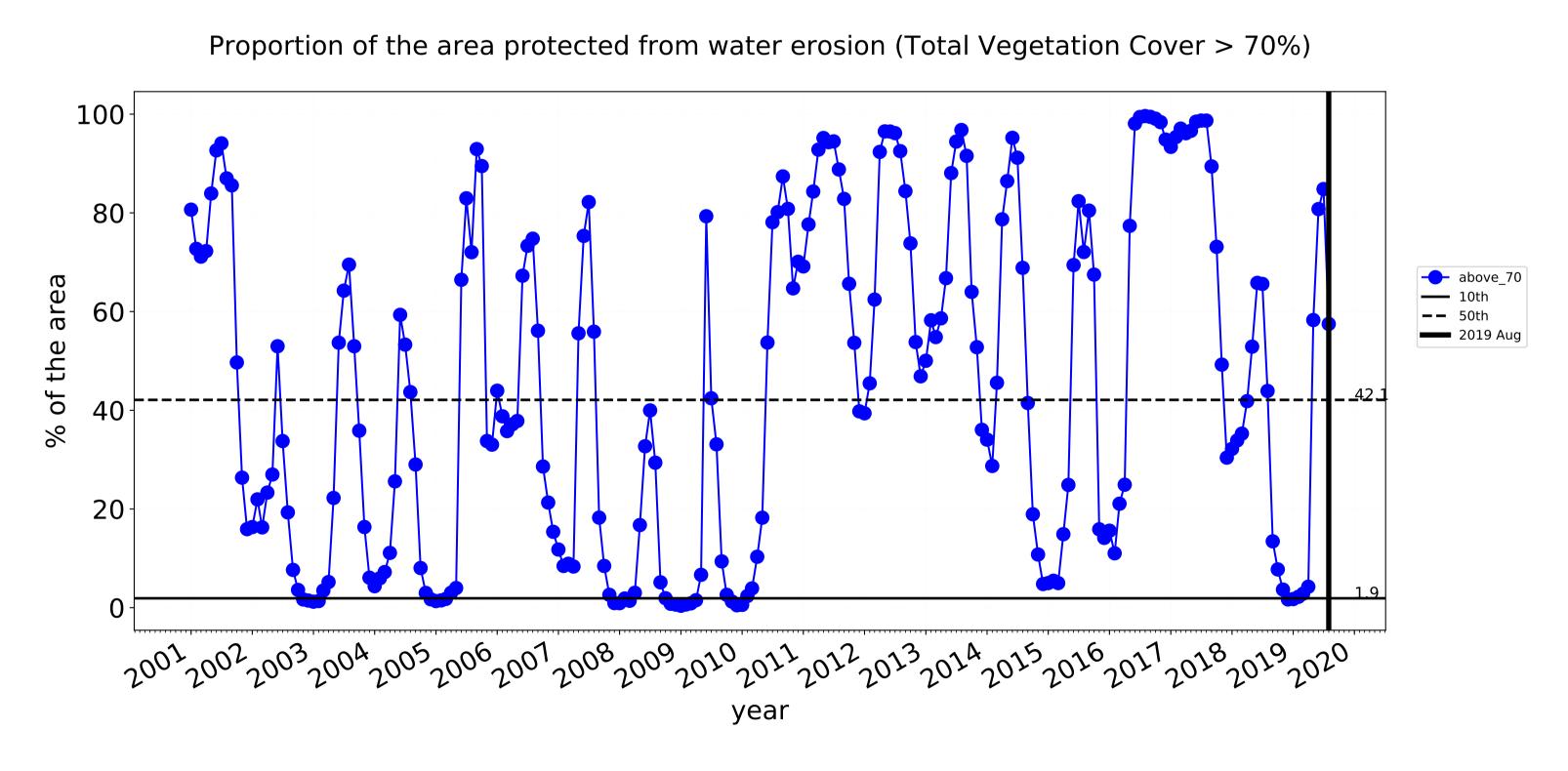


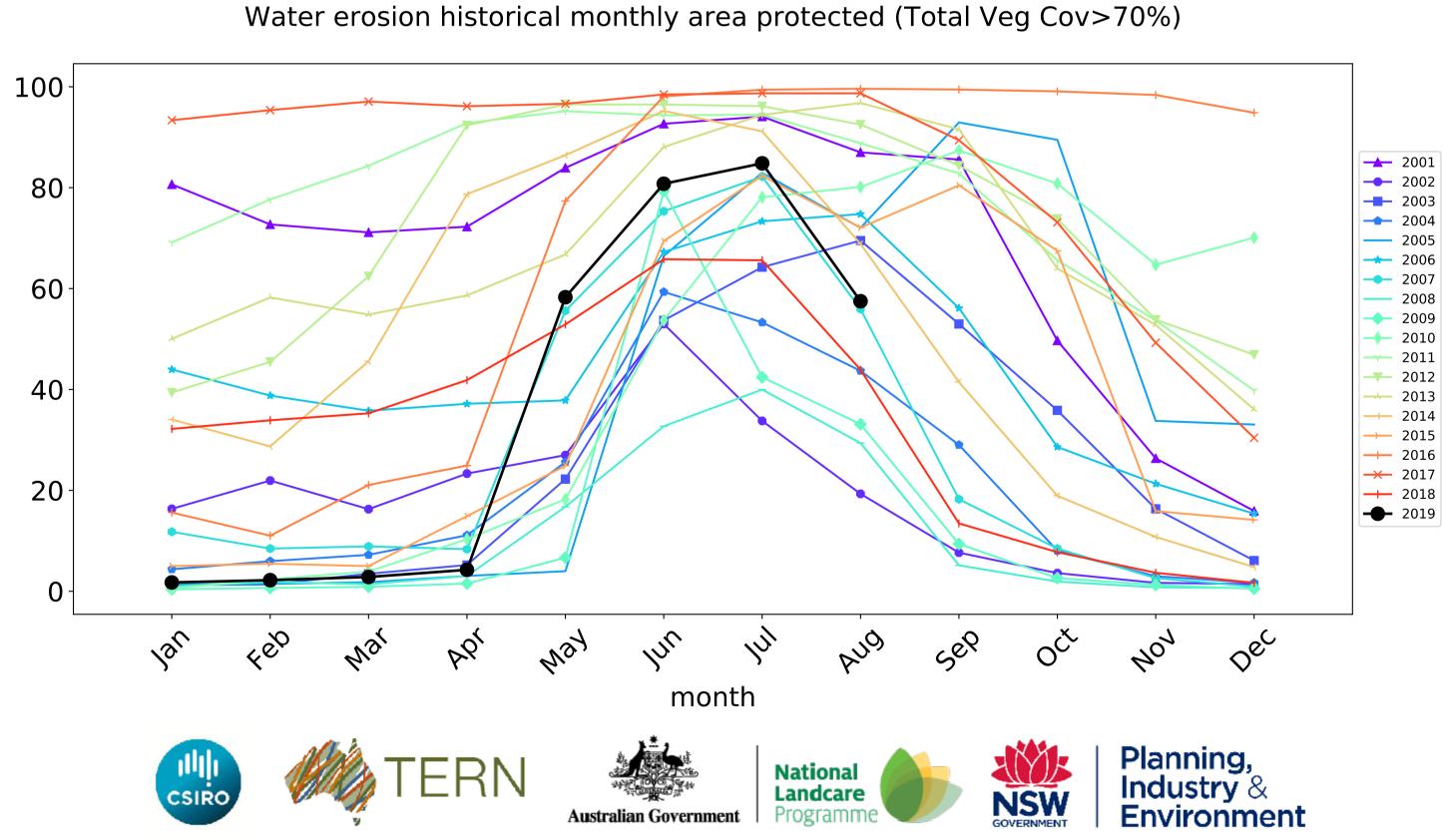


### **Grazing non forest timeseries**









### **Grazing Woodland forest**

### Land use and forest cover

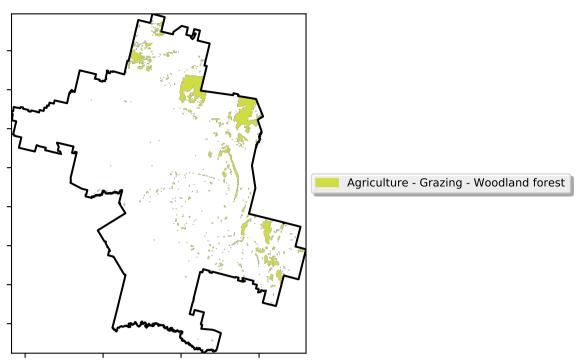
Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

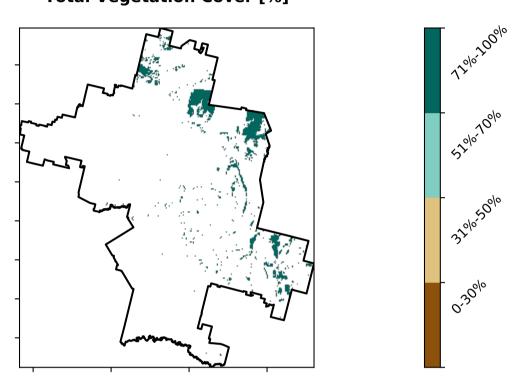
pixel is from the mean. That

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

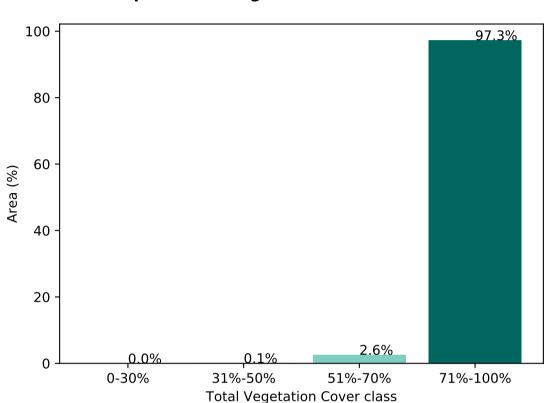
is, red pixels are about 20% lower than the mean of that



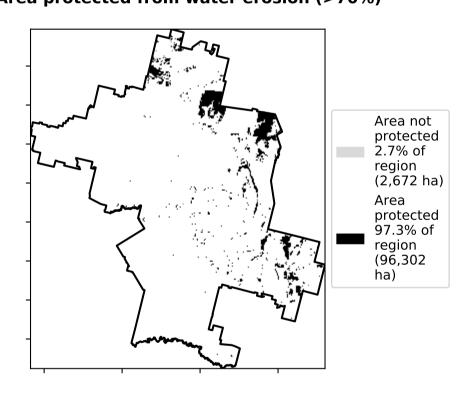
### **Total Vegetation Cover [%]**



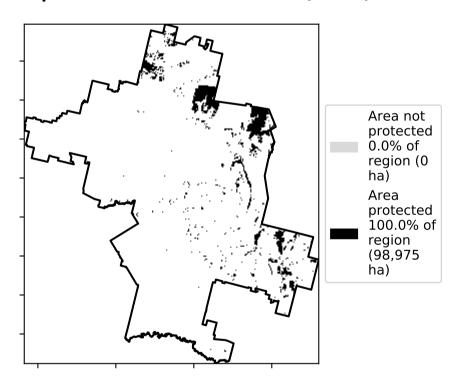
### **Proportion of vegetation cover class in area**



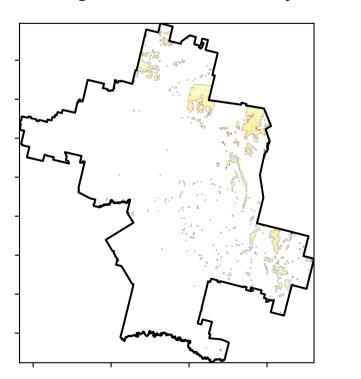
### % Area protected from water erosion (>70%)

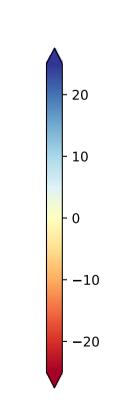


% Area protected from wind erosion (>50%)

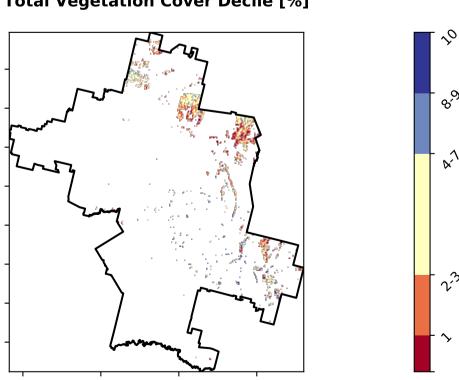


### **Total Vegetation Cover Anomaly [%]**





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.







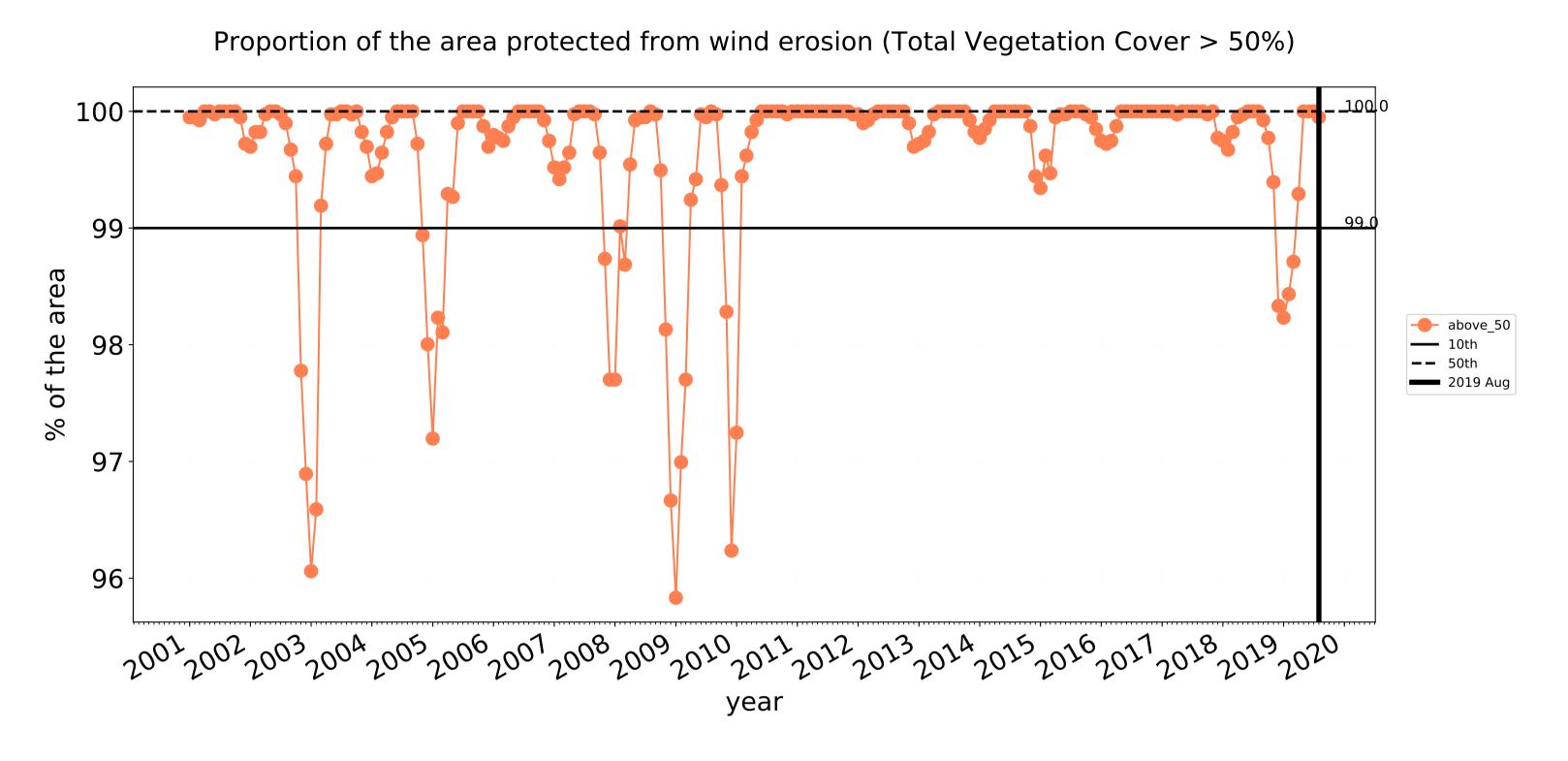


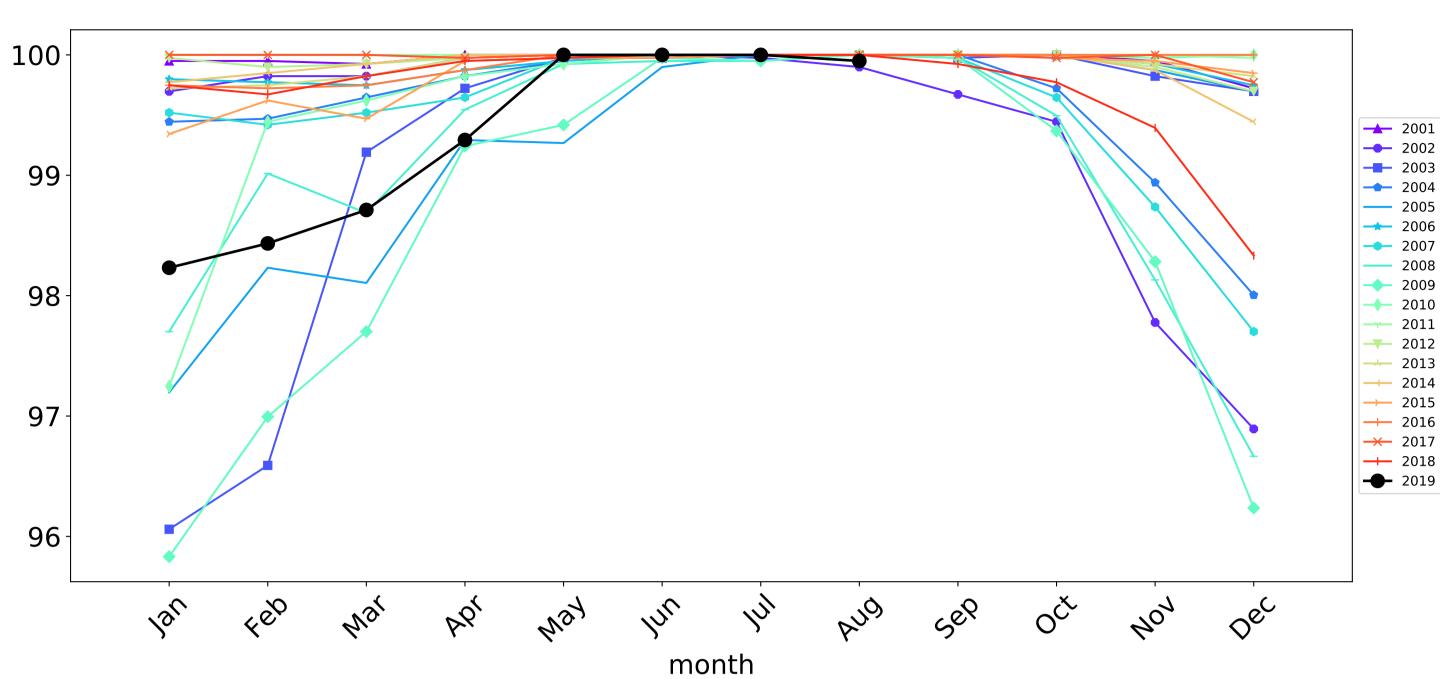




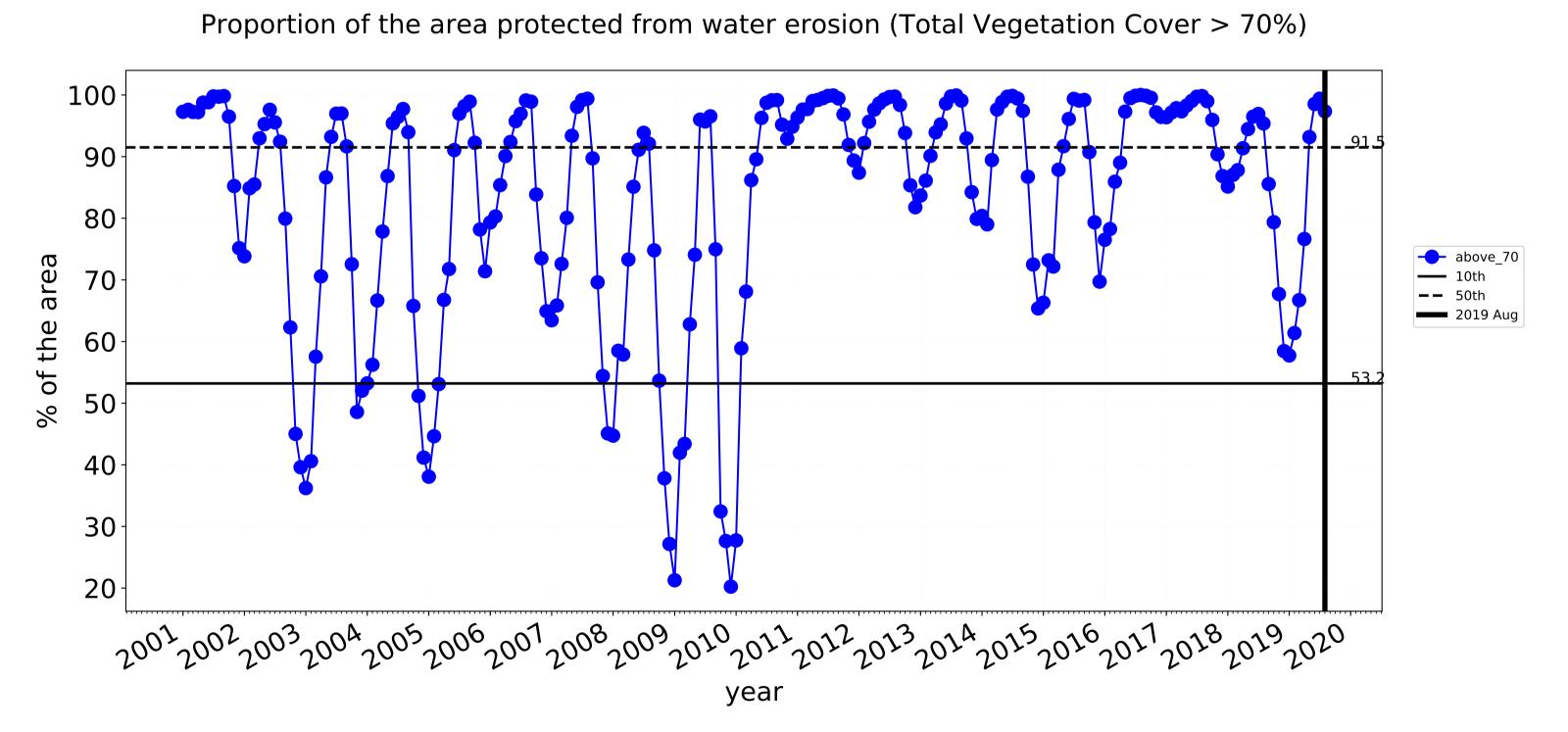


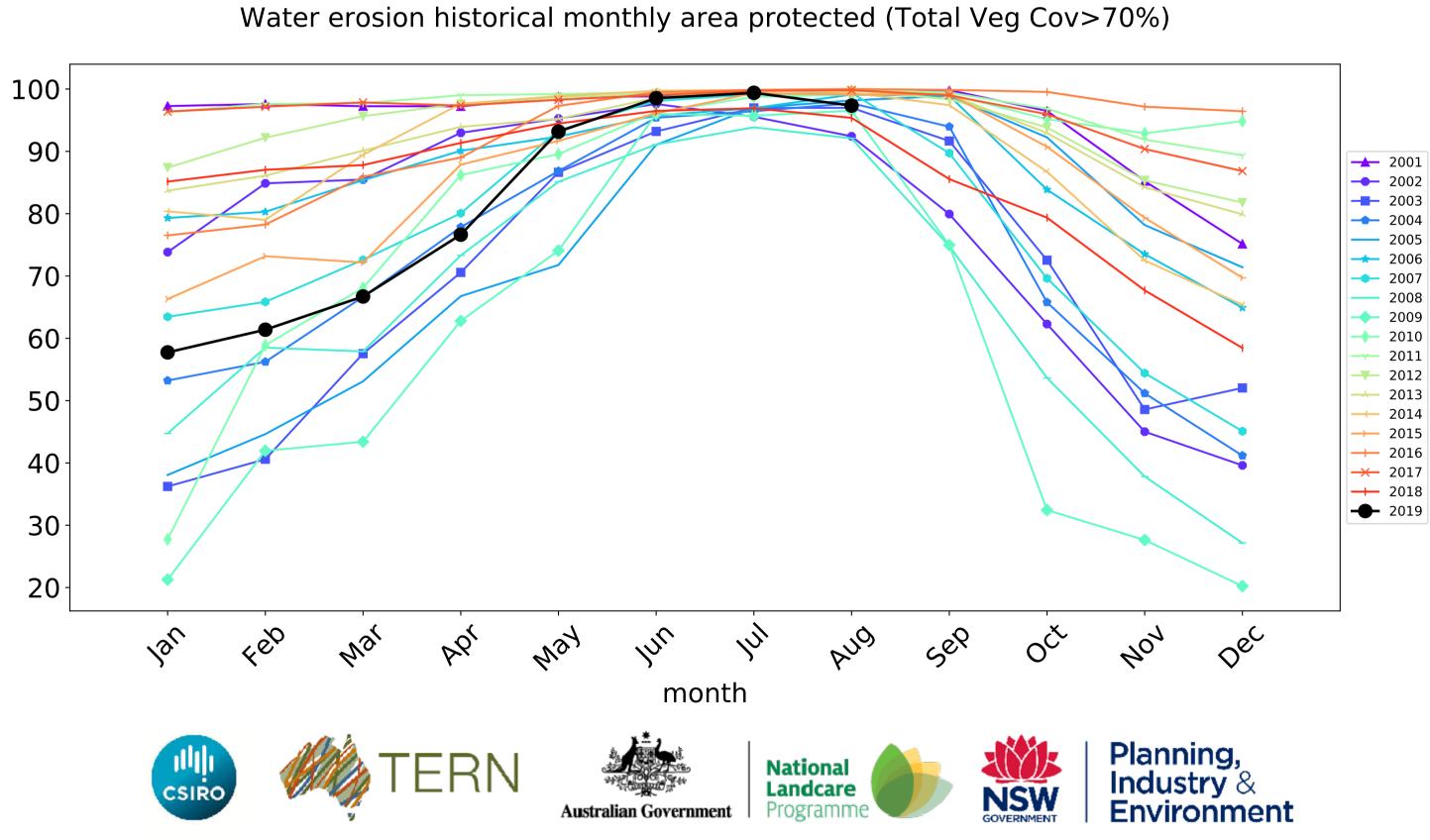
### **Grazing Woodland forest timeseries**





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





### **Grazing - Forest (non woodland)**

### Land use and forest cover

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

pixel is from

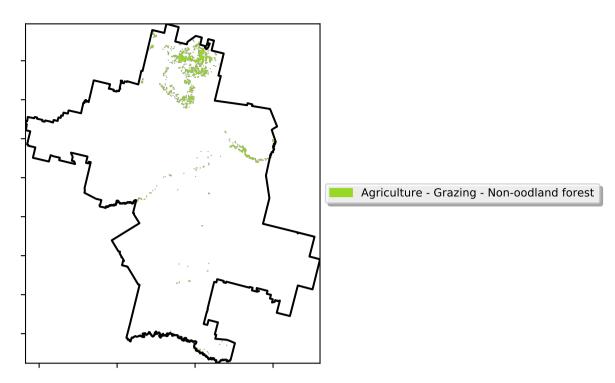
is, red pixels are about 20% lower than the

mean of that pixel. The mean

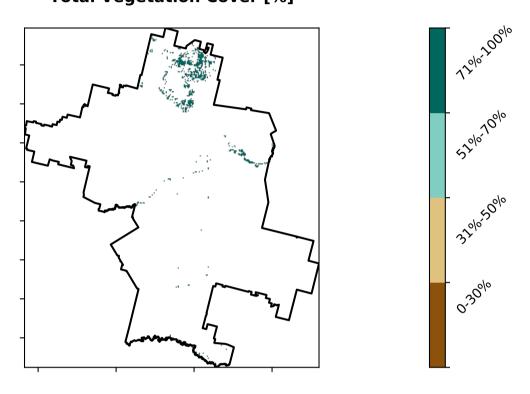
is only for the month of the map

using baseline from 2001 to 2019.

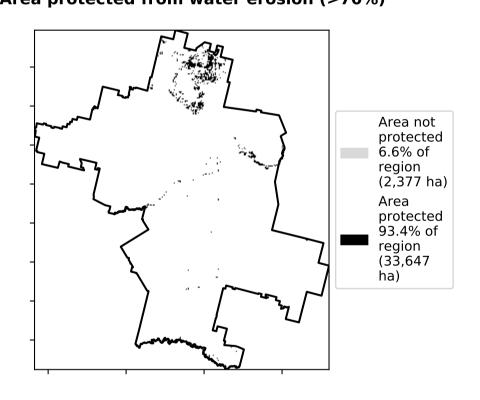
the mean. That



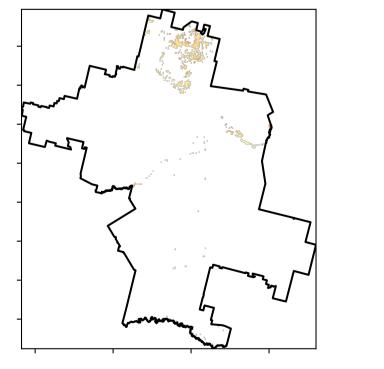
### **Total Vegetation Cover [%]**

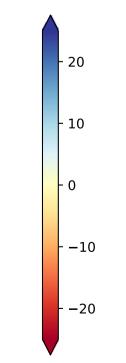


### % Area protected from water erosion (>70%)



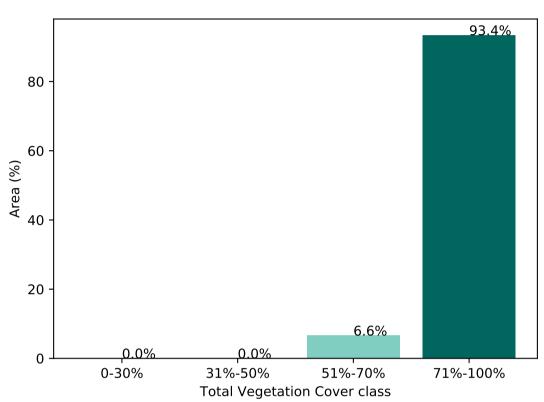
### **Total Vegetation Cover Anomaly [%]**



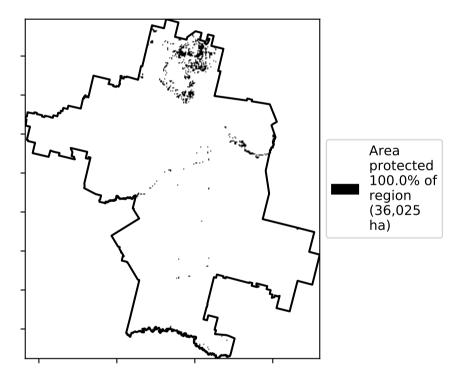


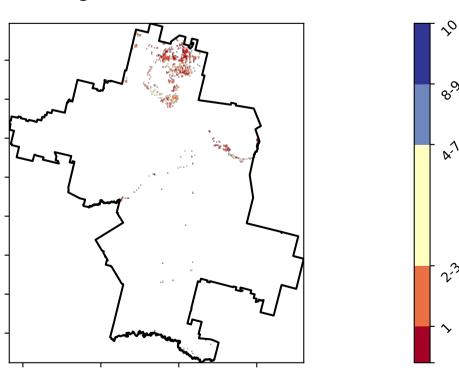
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### **Proportion of vegetation cover class in area**



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







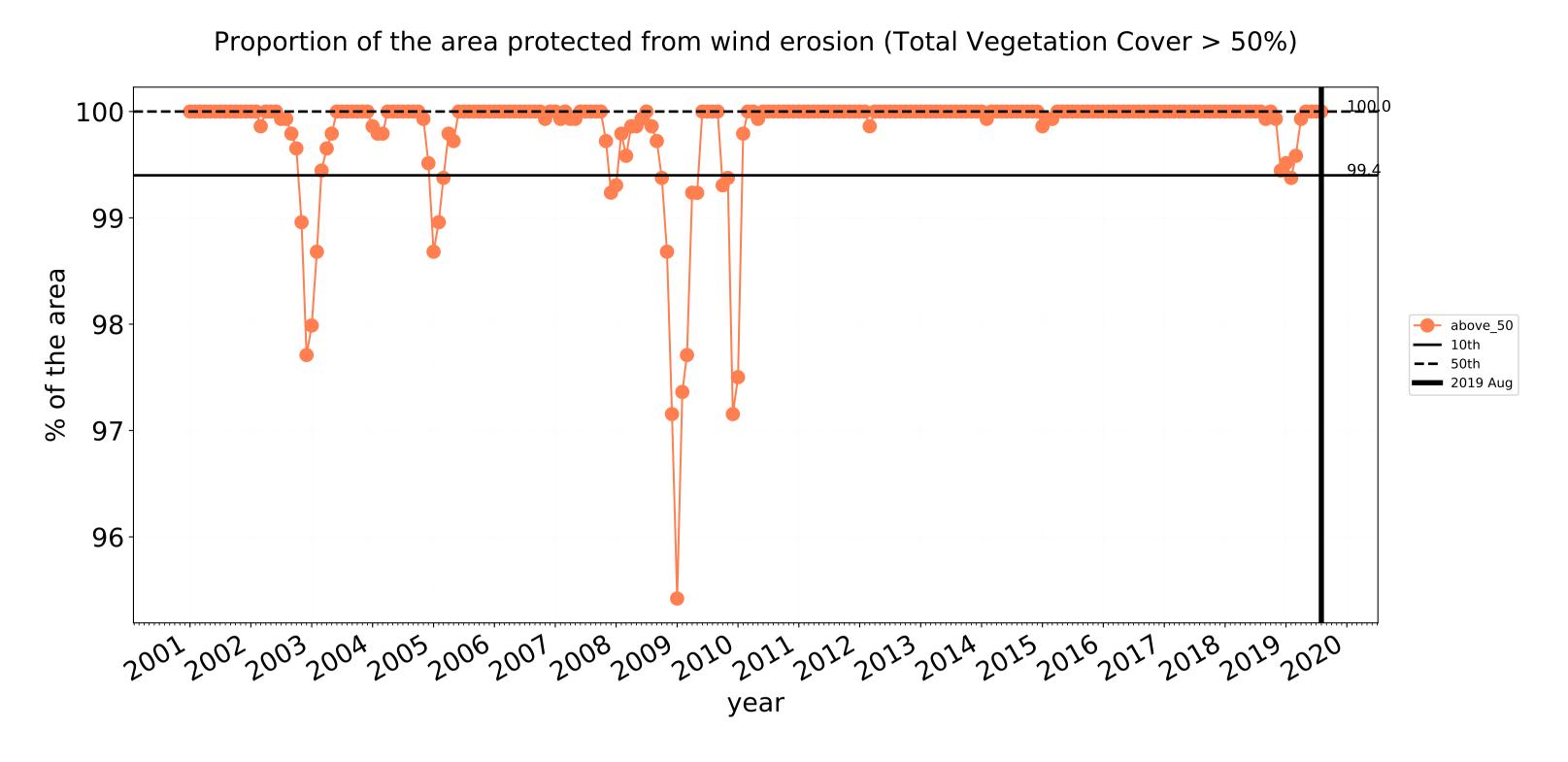


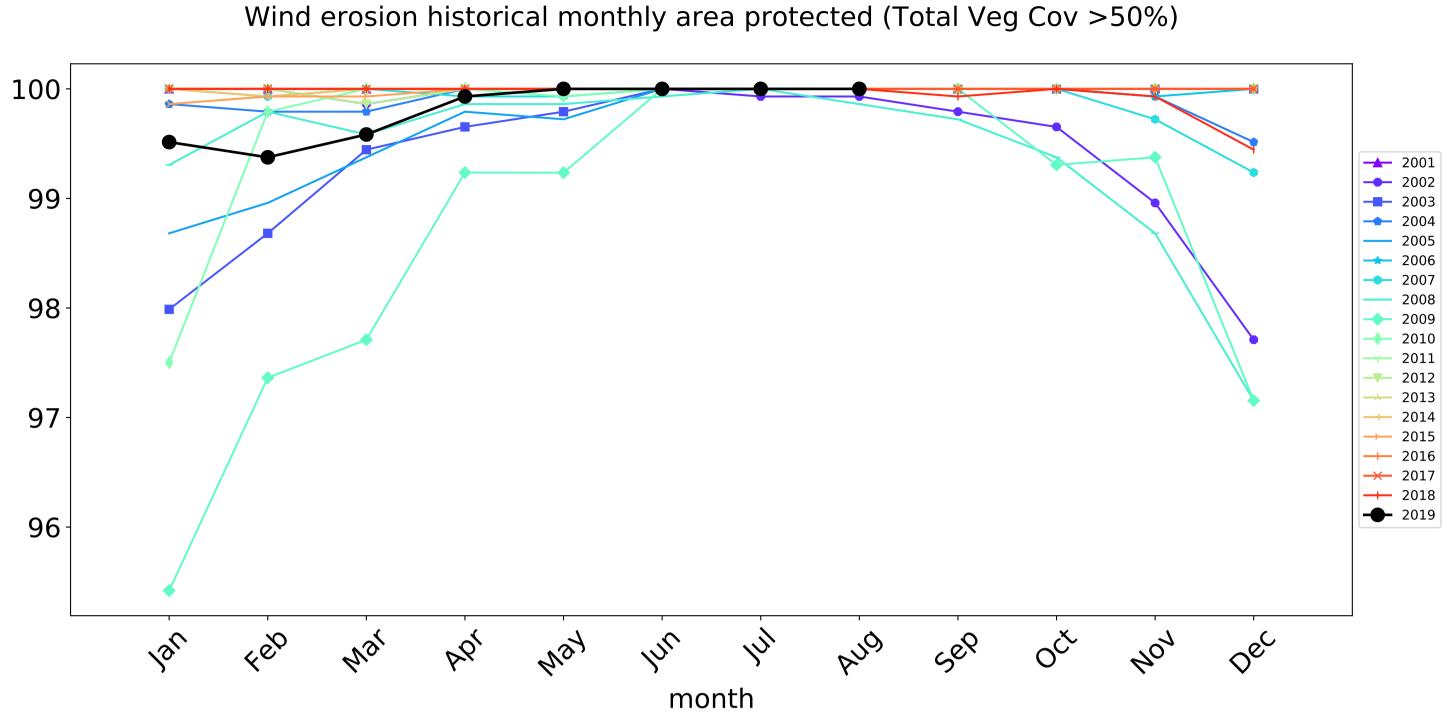


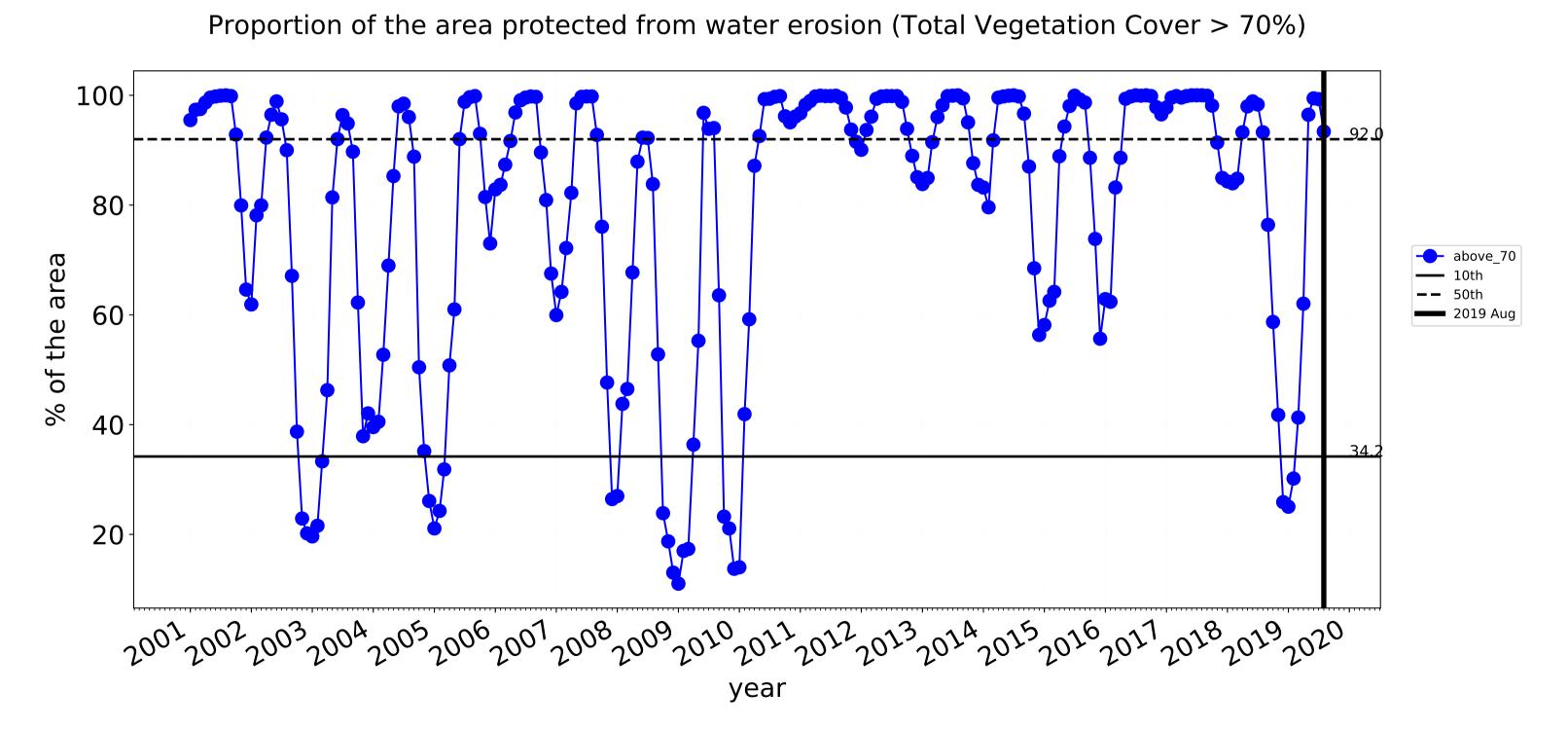


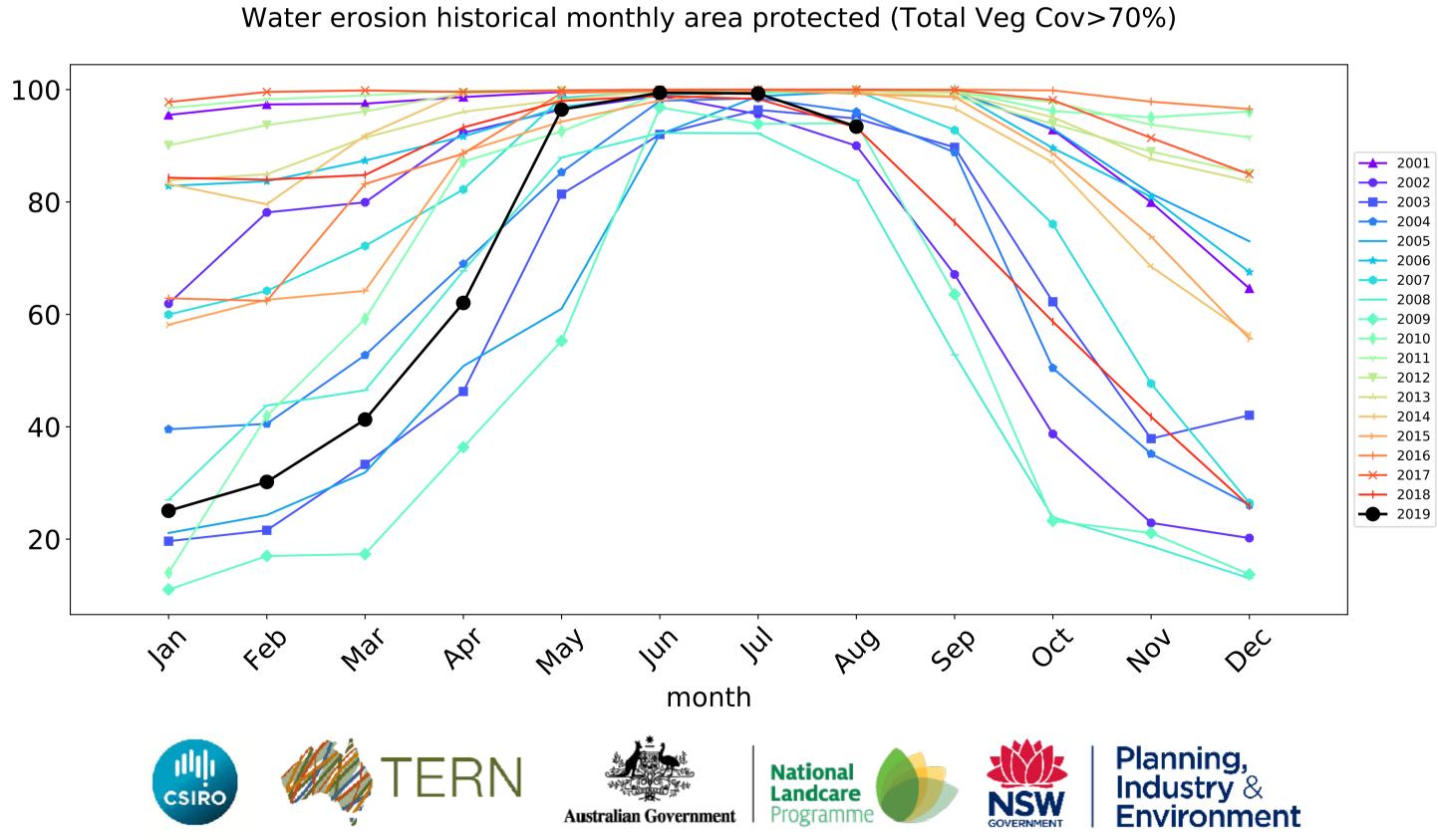












### **Cropping**

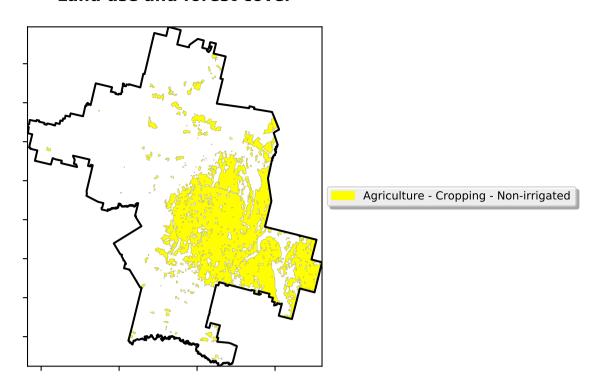
### Land use and forest cover

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

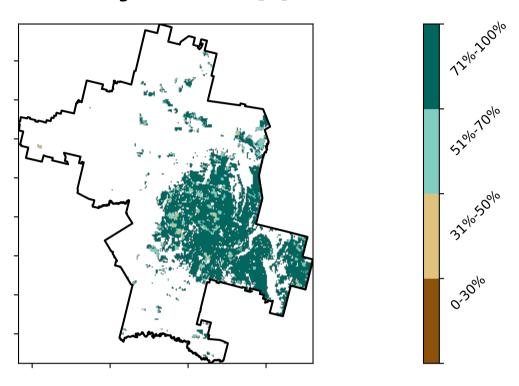
Anomaly show how many percetage points each

pinel is from the mean. That is, red pixels are about 20% lower than the mean of that

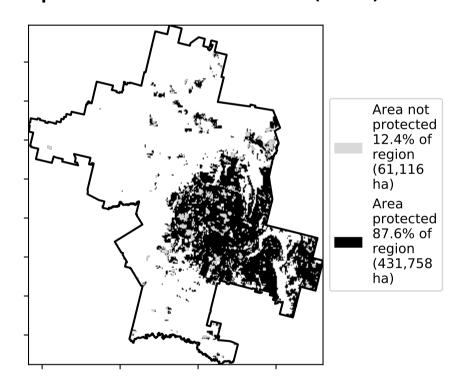
pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



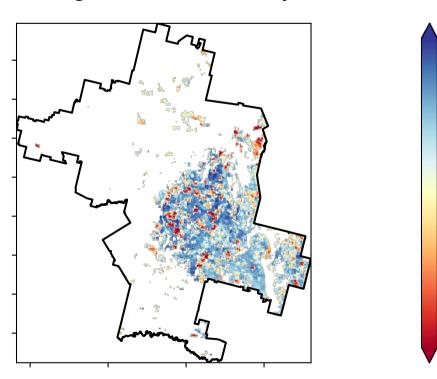
### **Total Vegetation Cover [%]**



### % Area protected from water erosion (>70%)

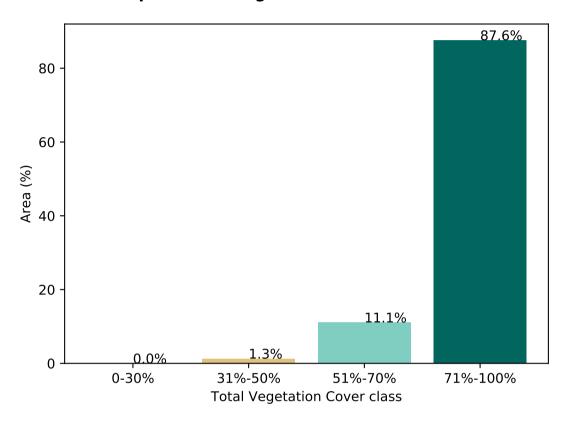


### **Total Vegetation Cover Anomaly [%]**

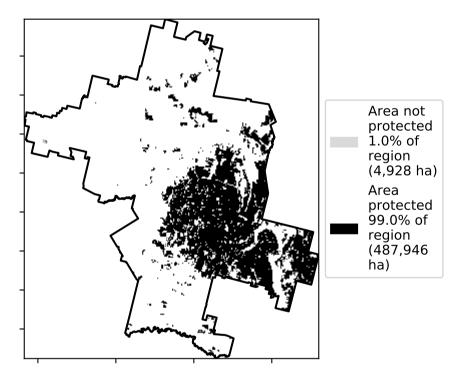


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

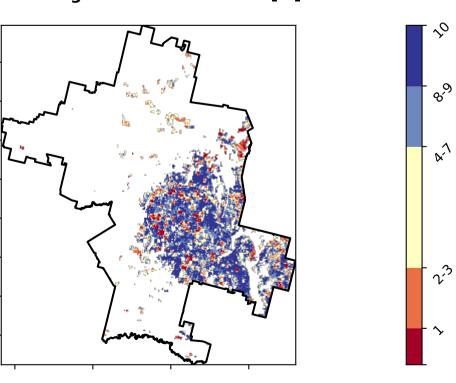
### **Proportion of vegetation cover class in area**



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



### Total Vegetation Cover Decile [%]















- 20

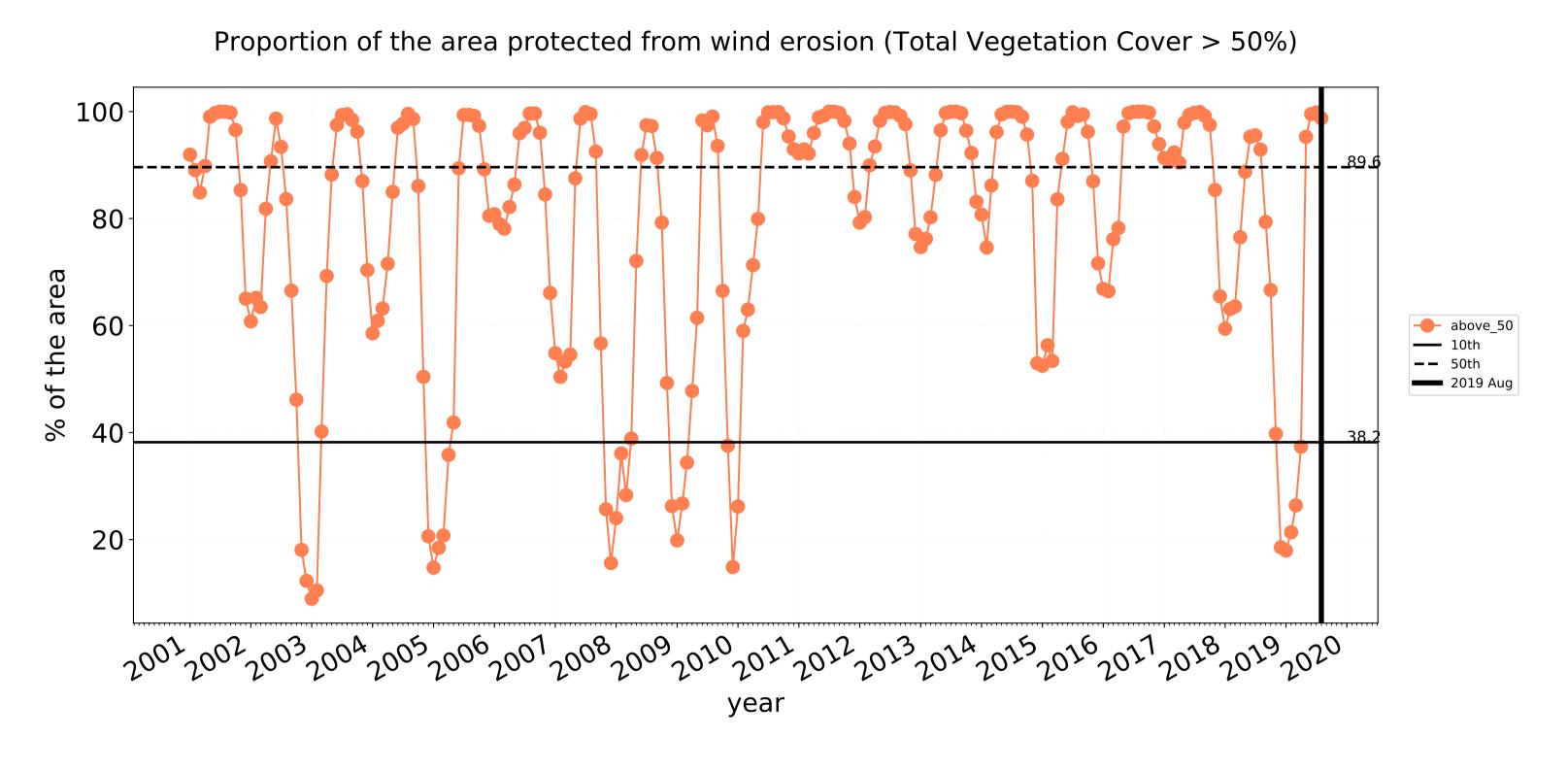
- 10

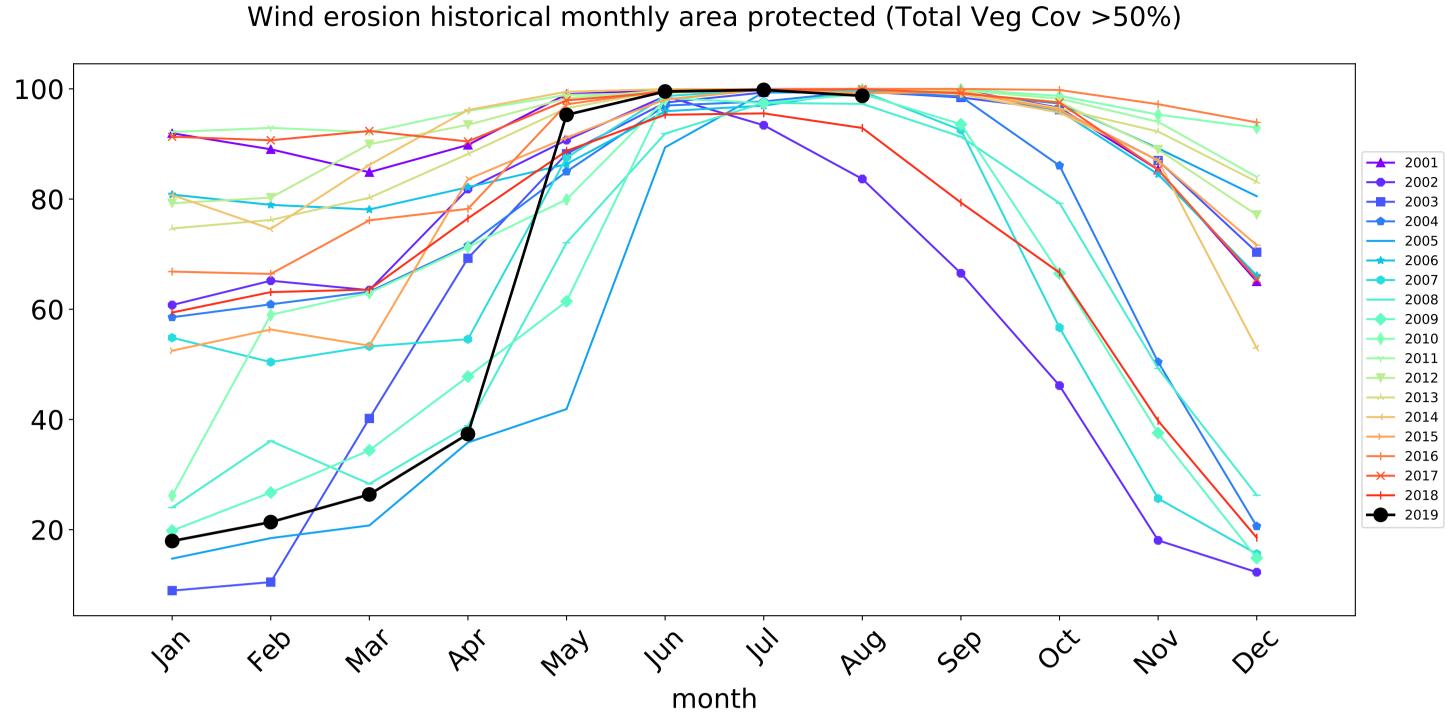
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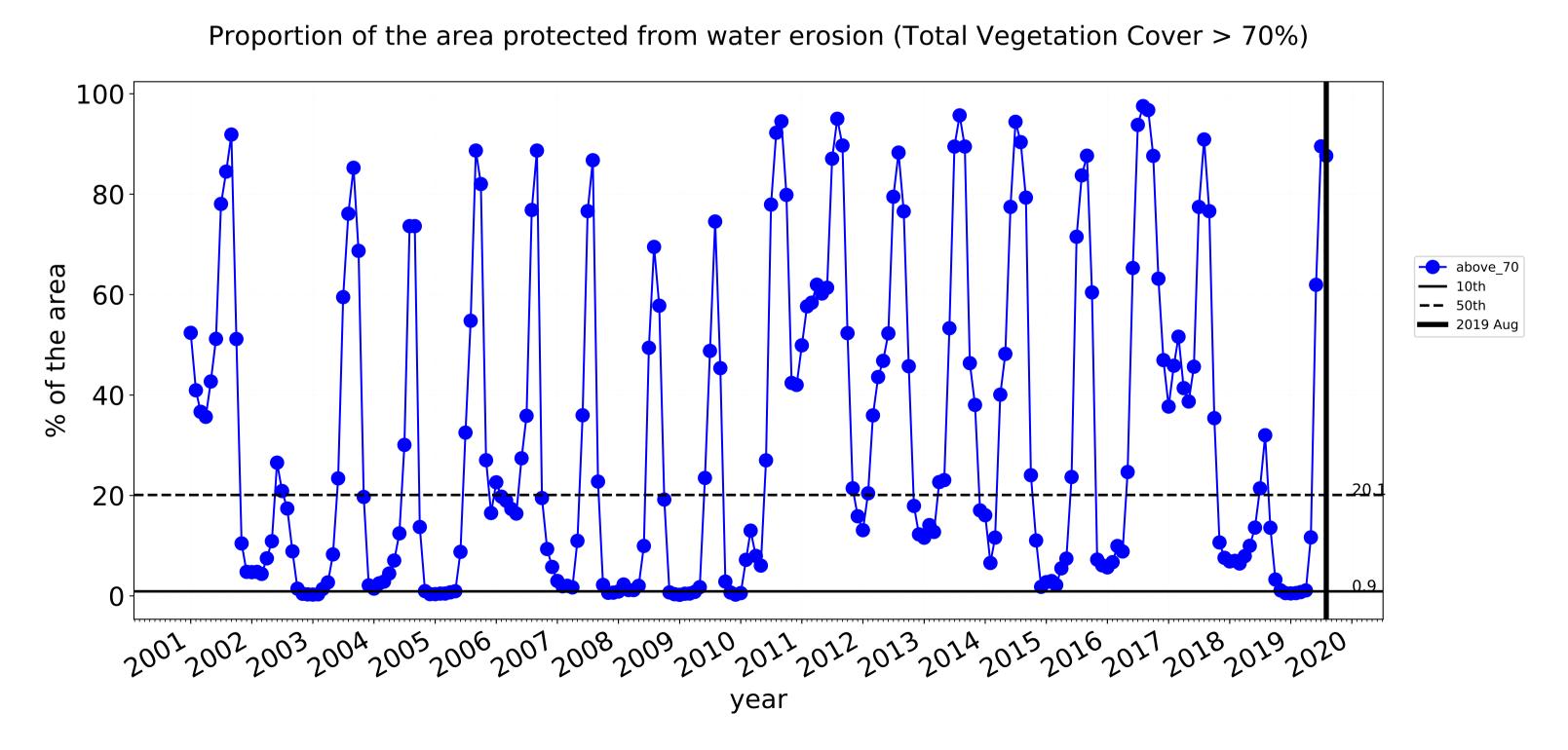
-10

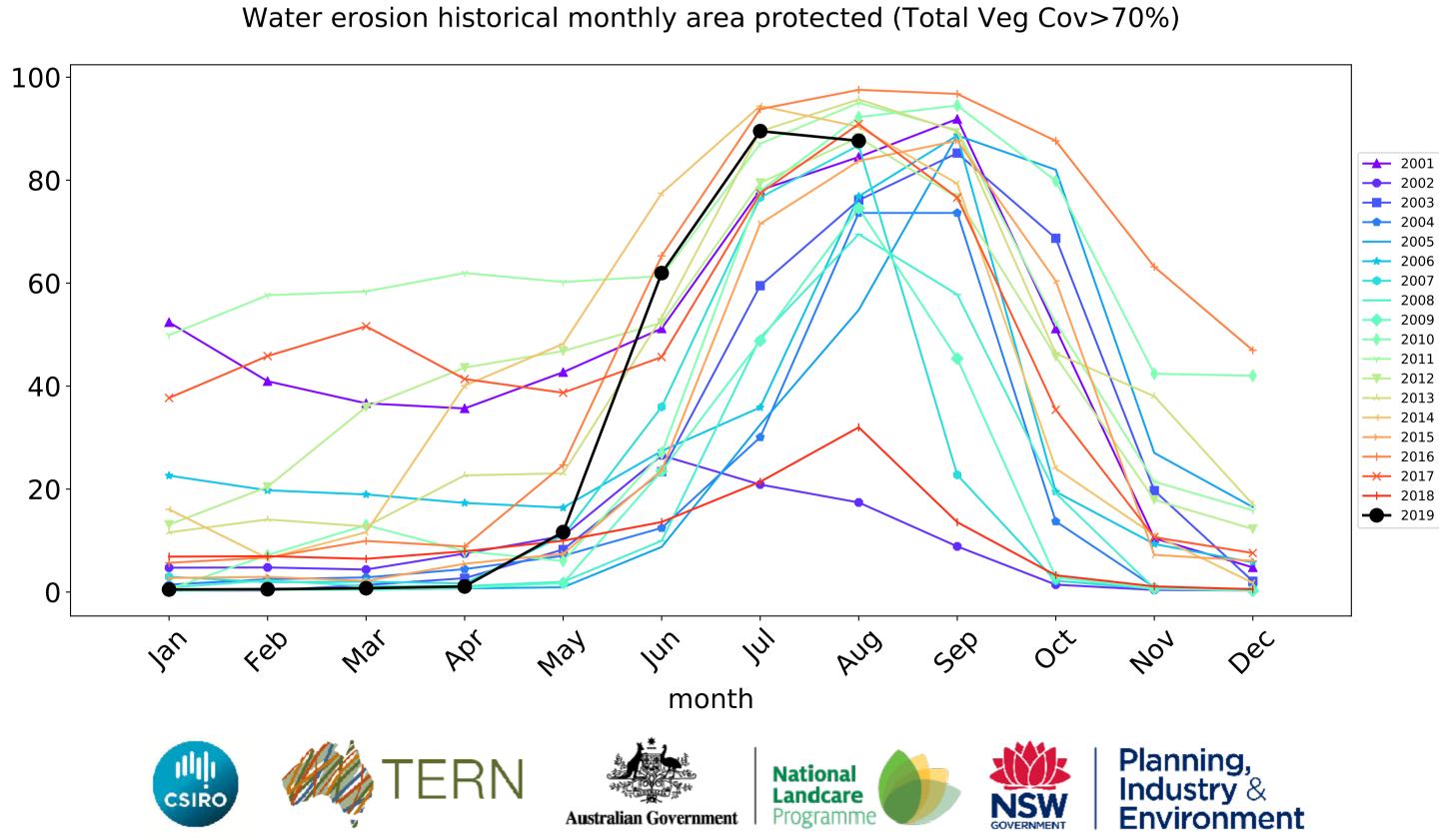
**-**20

### **Cropping timeseries**









### **Irrigation**

### Land use and forest cover

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

pixel is from

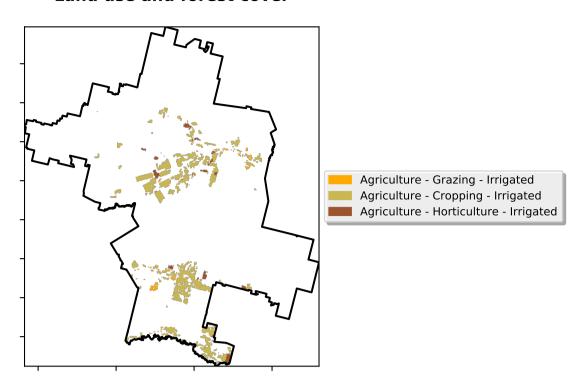
is, red pixels are about 20% lower than the

mean of that pixel. The mean

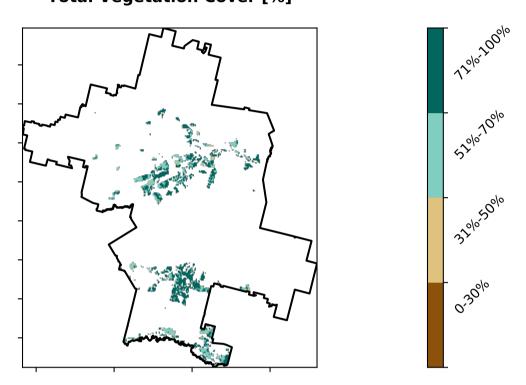
is only for the month of the map

using baseline from 2001 to 2019.

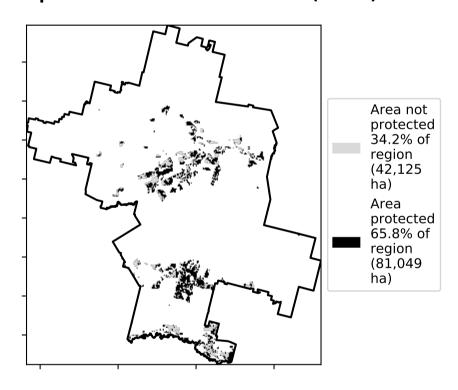
the mean. That



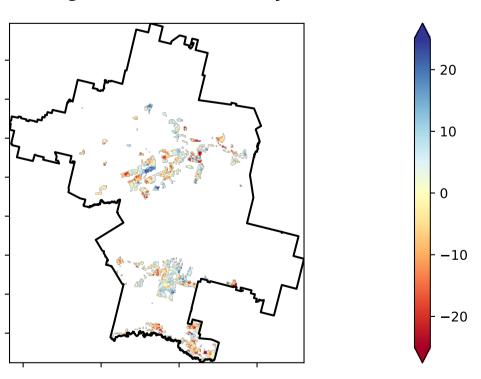
### **Total Vegetation Cover [%]**



### % Area protected from water erosion (>70%)

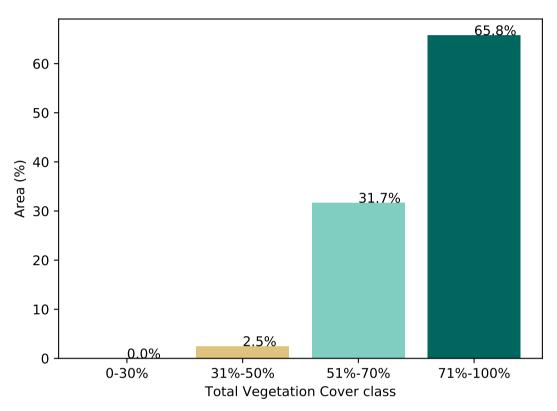


### **Total Vegetation Cover Anomaly [%]**

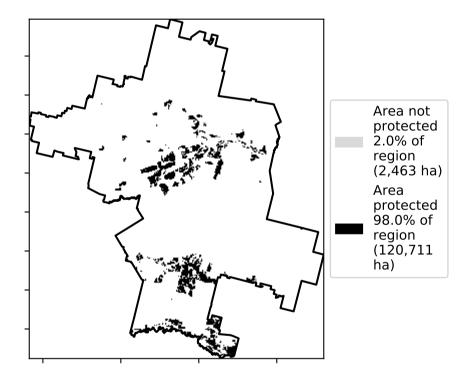


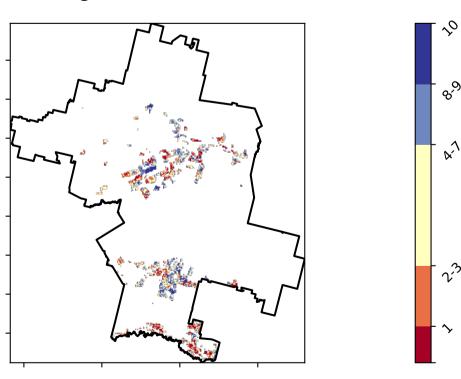
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

### **Proportion of vegetation cover class in area**



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







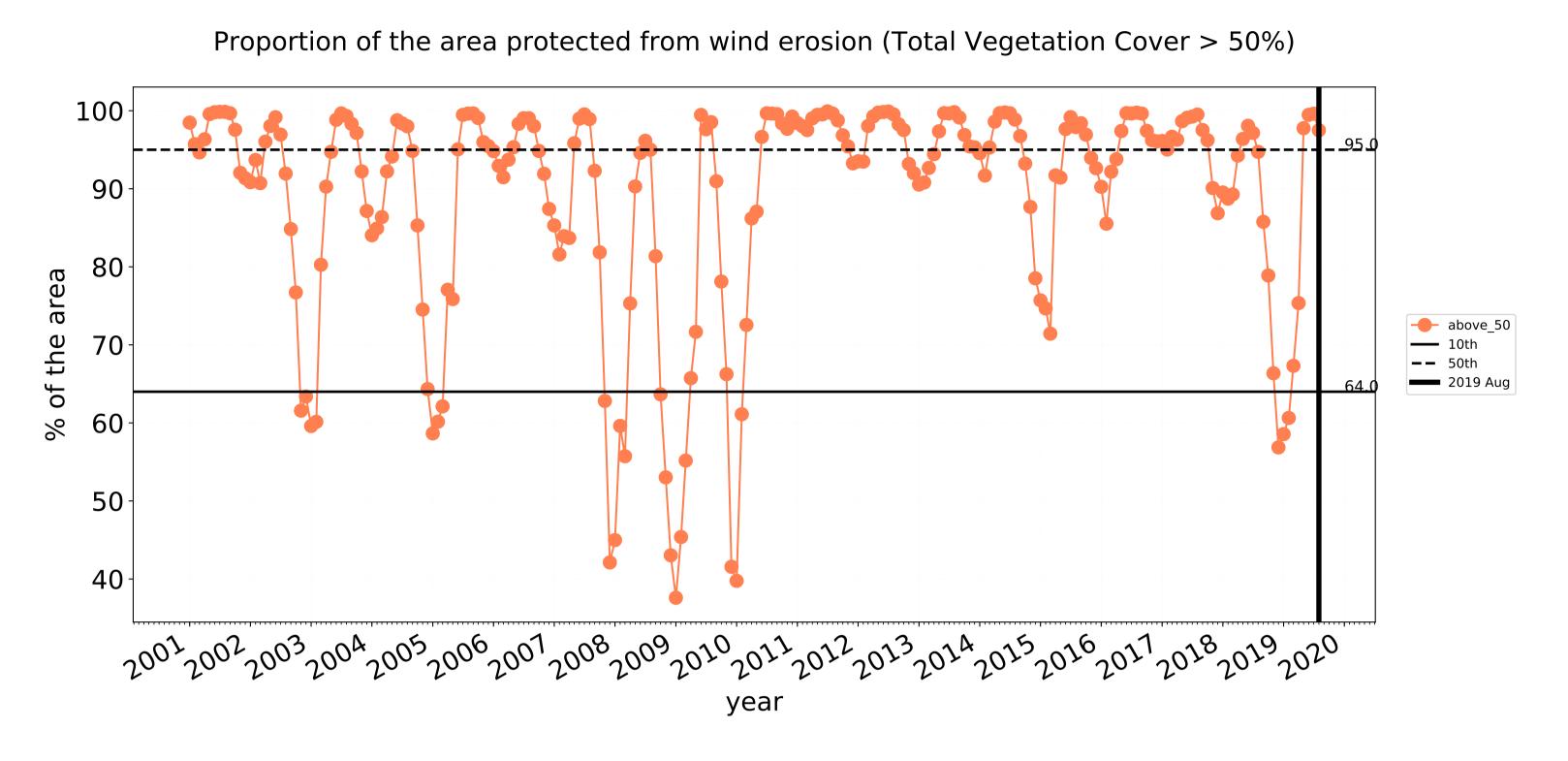


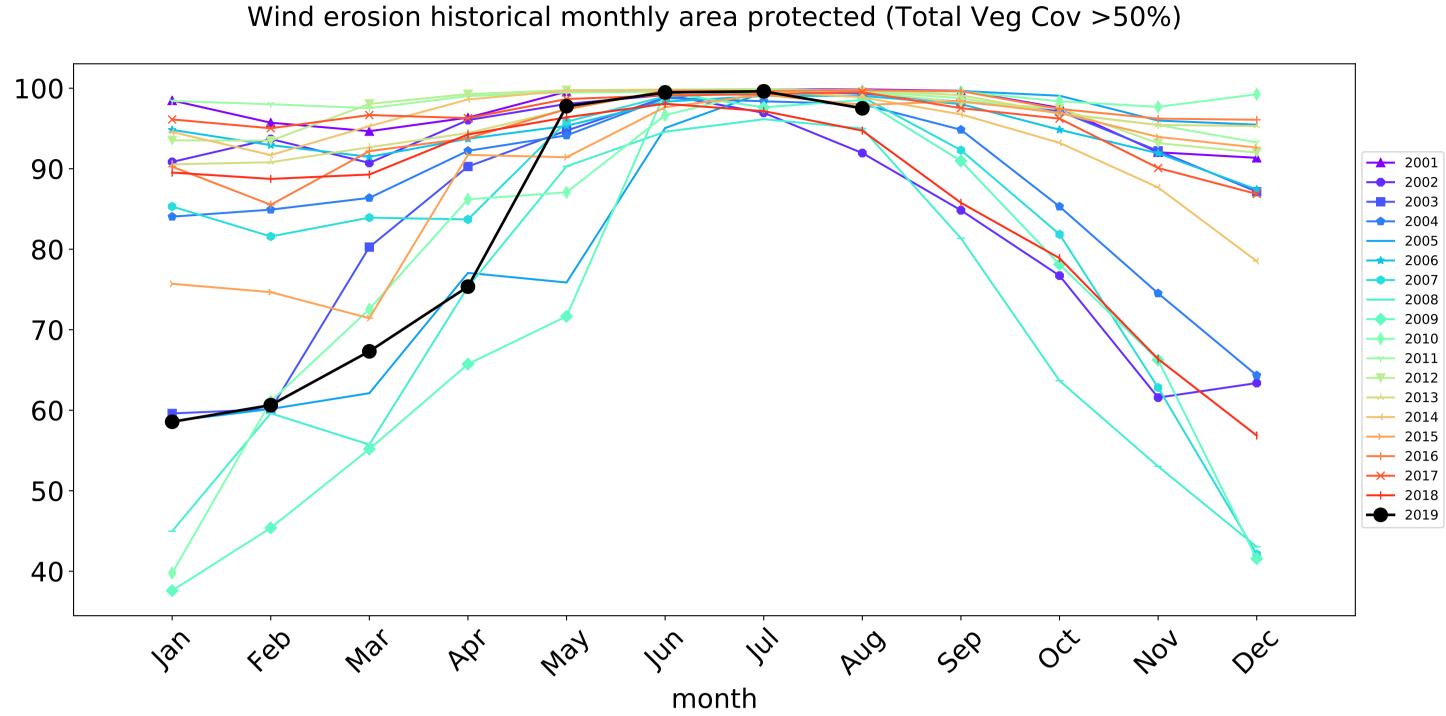


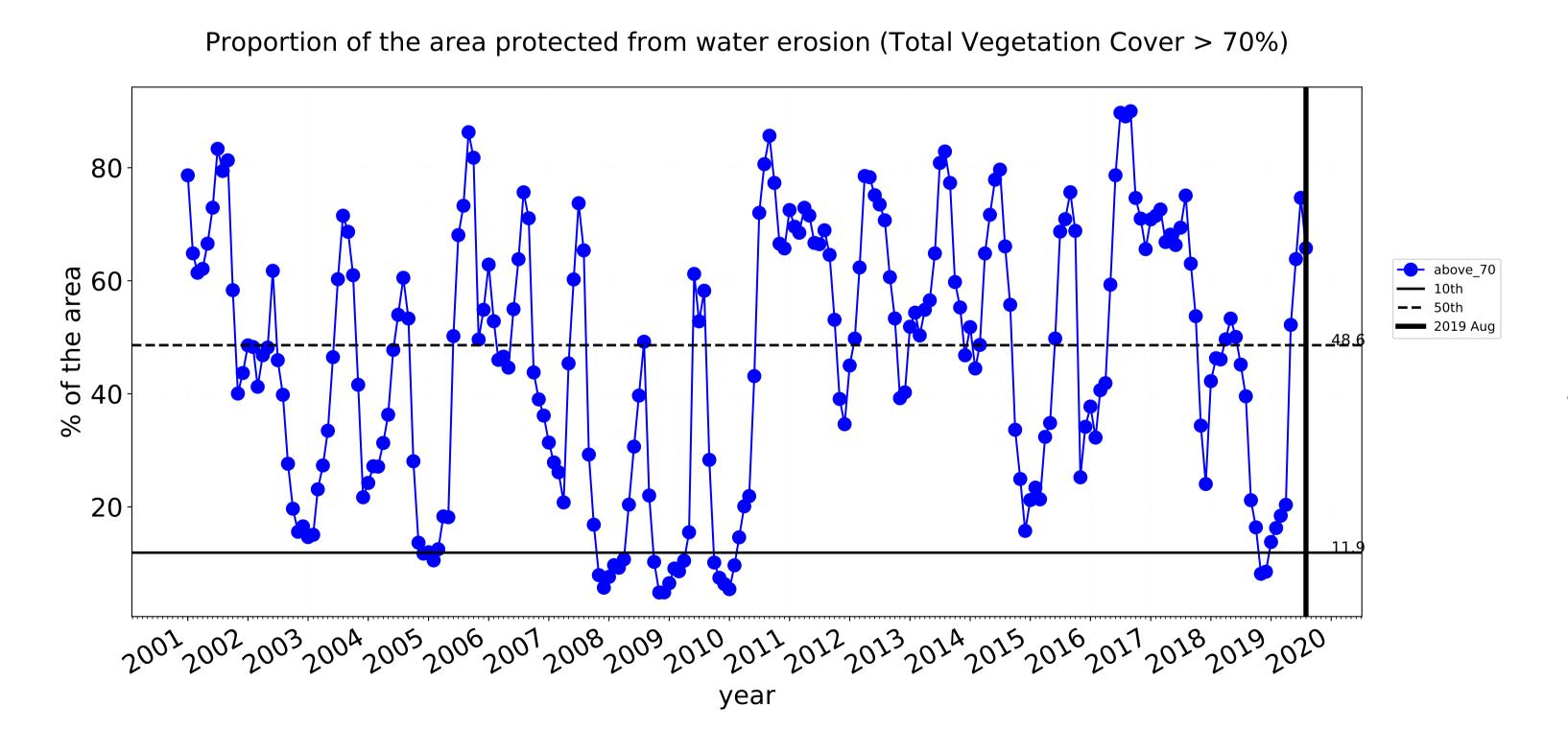


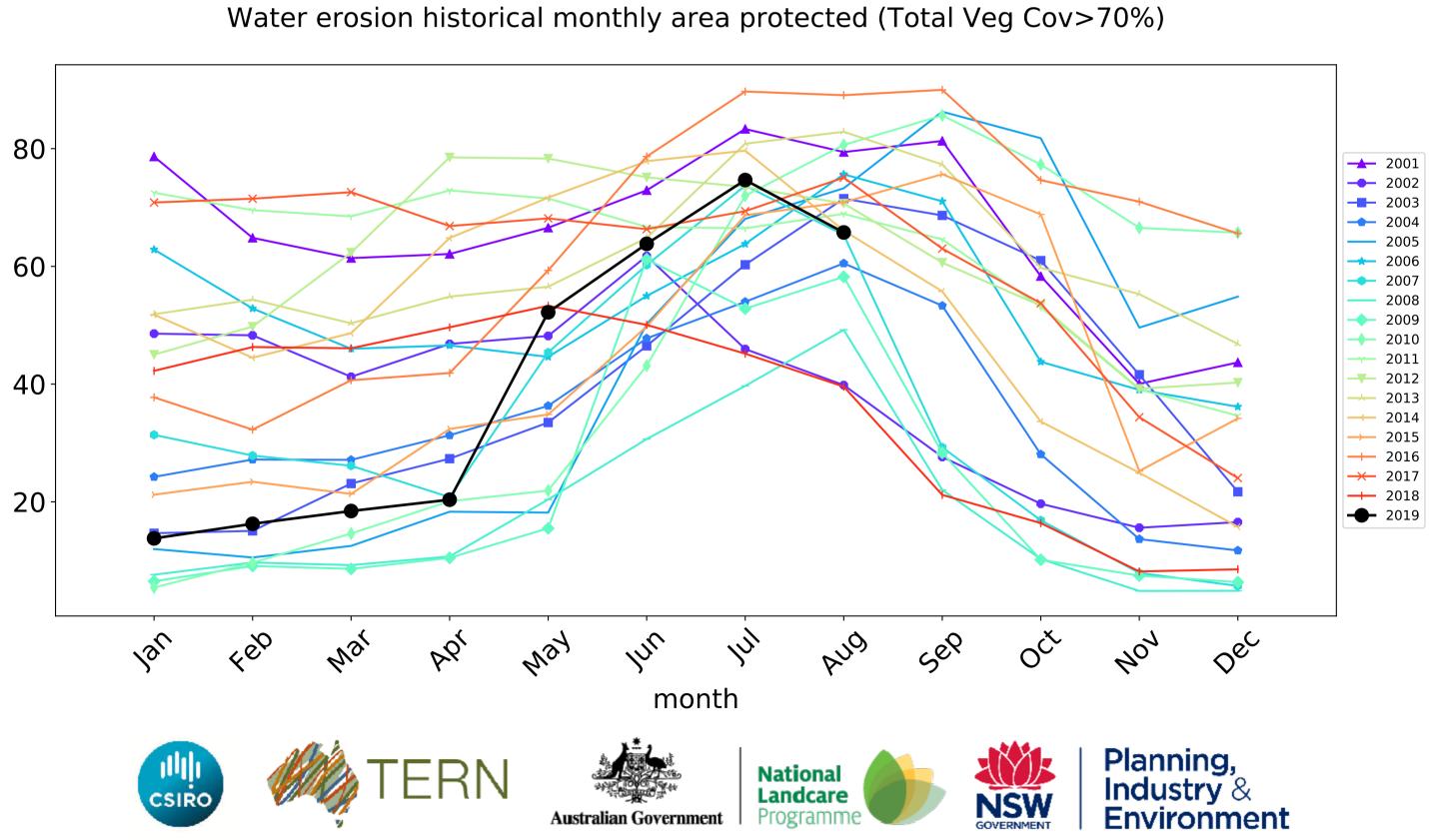












### **Production native forests and plantation forests**

Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is < 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

Anomaly show how many percetage points each

pixel is from

is, red pixels are about 20% lower than the mean of that pixel. The mean

the mean. That

is only for the month of the map

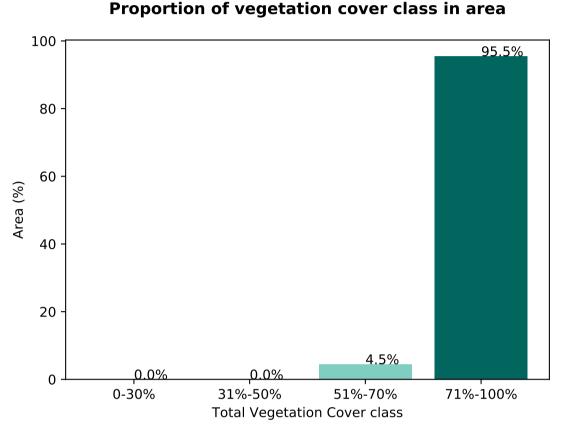
using baseline from 2001 to 2019.

# Production native forests and plantation forests

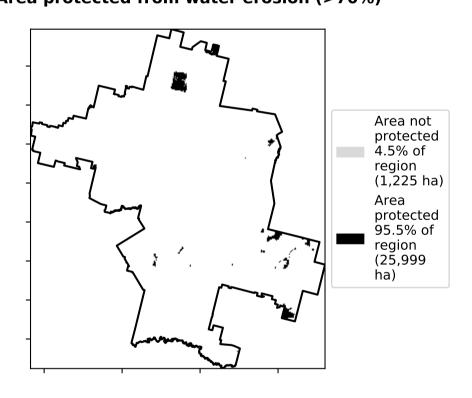
### **Total Vegetation Cover [%]**

Land use and forest cover

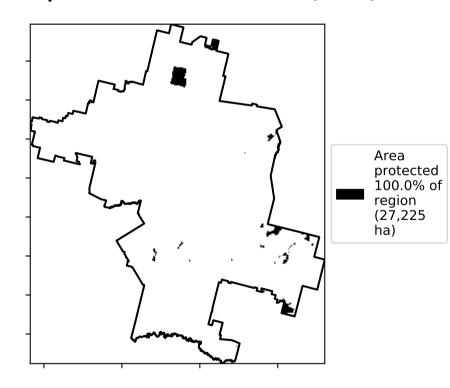




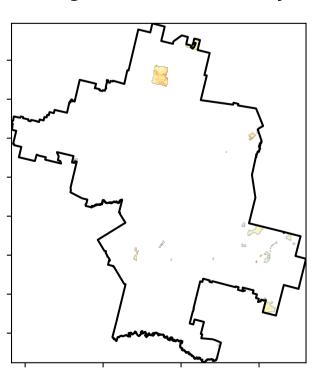
### % Area protected from water erosion (>70%)

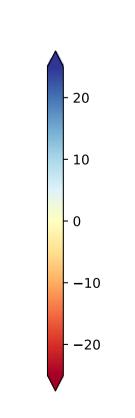


% Area protected from wind erosion (>50%)

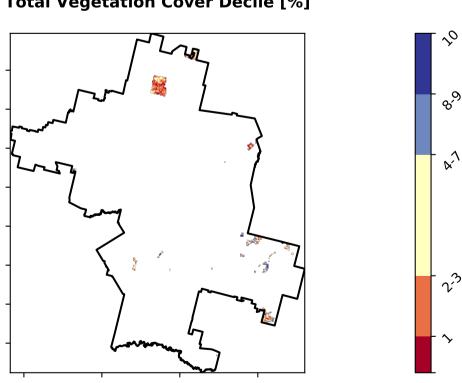


### **Total Vegetation Cover Anomaly [%]**





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.







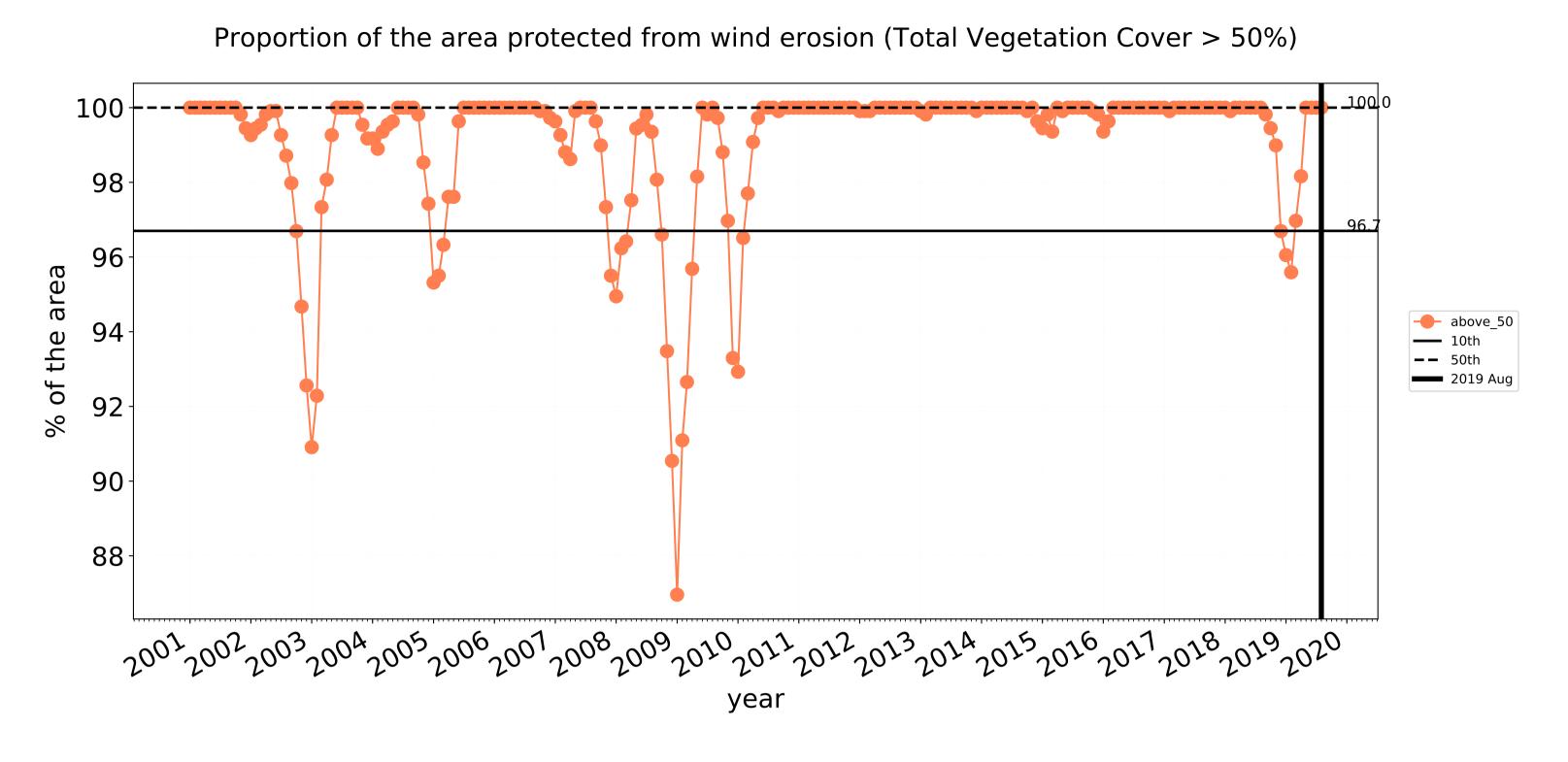


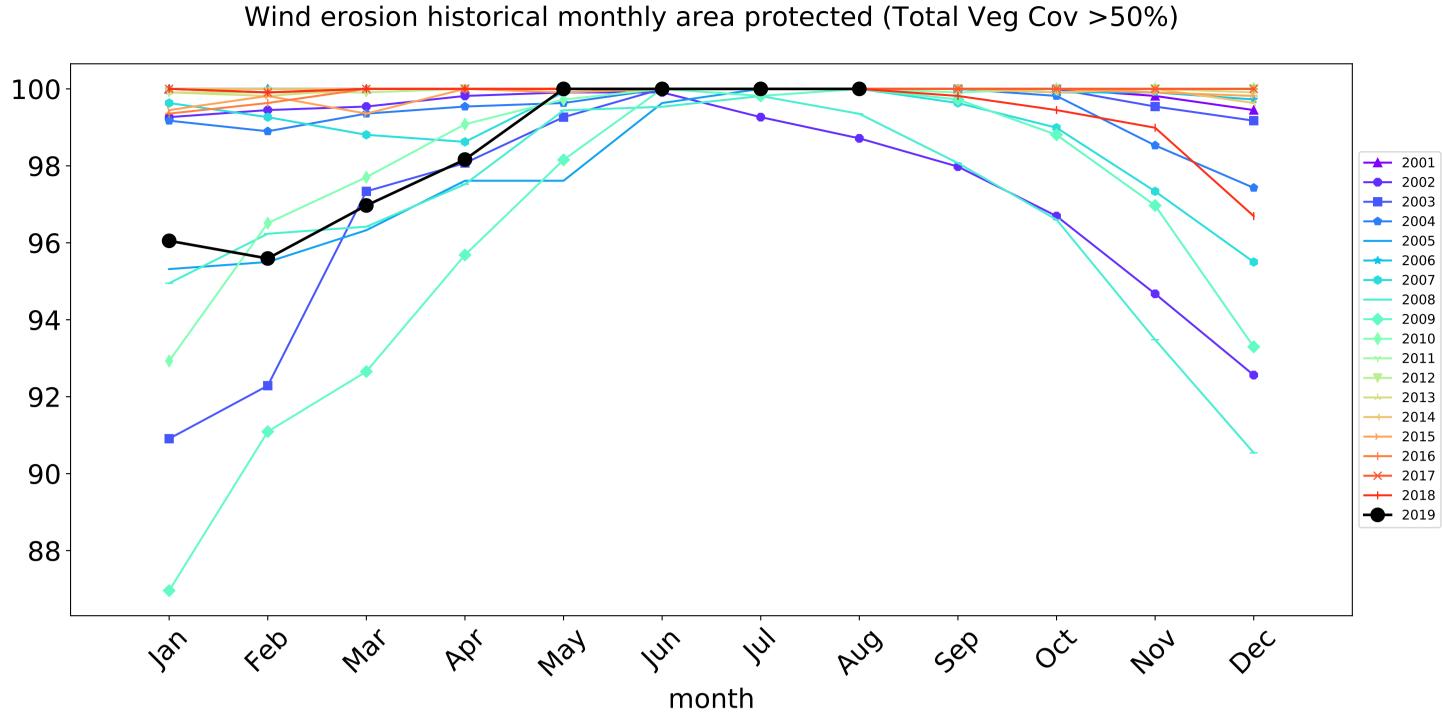


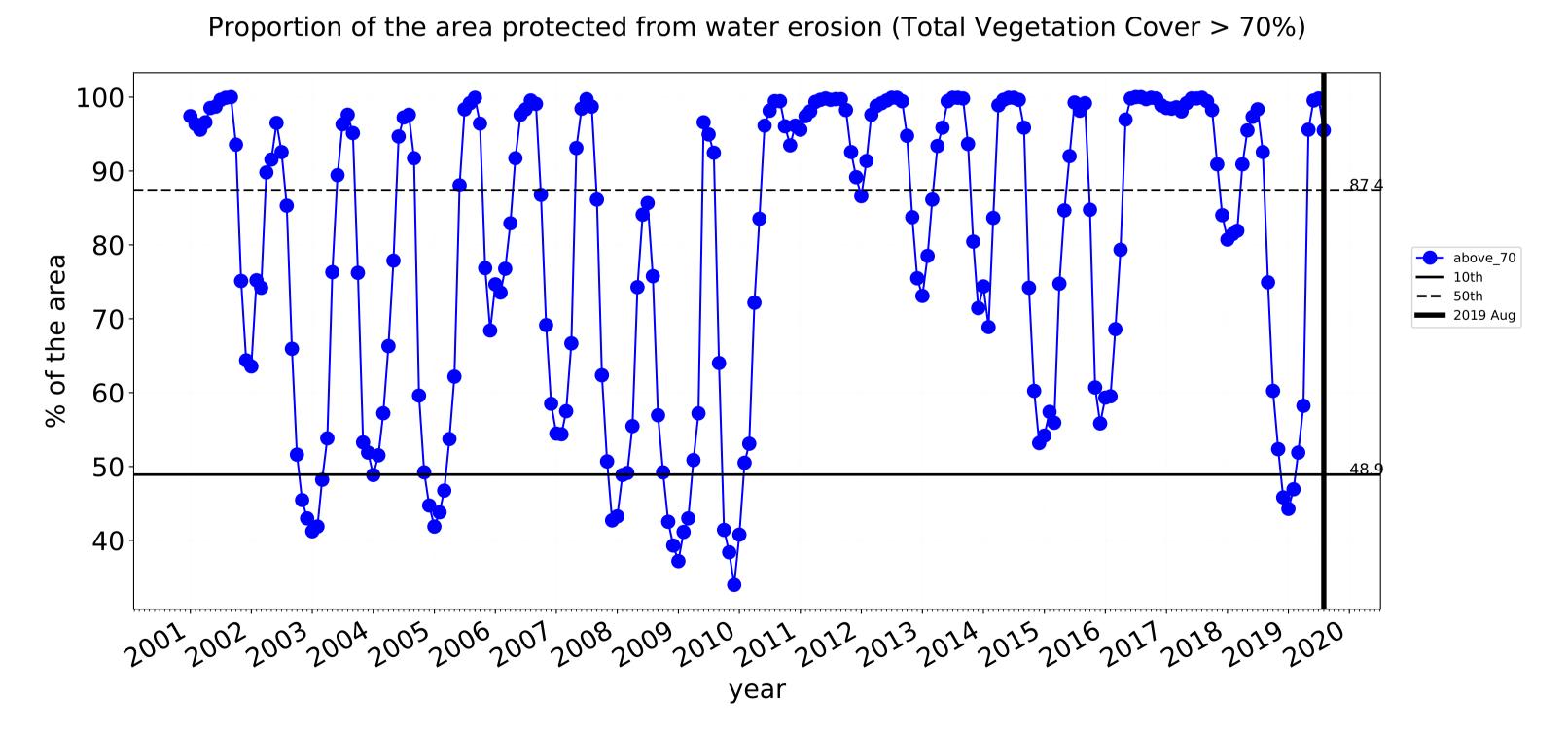


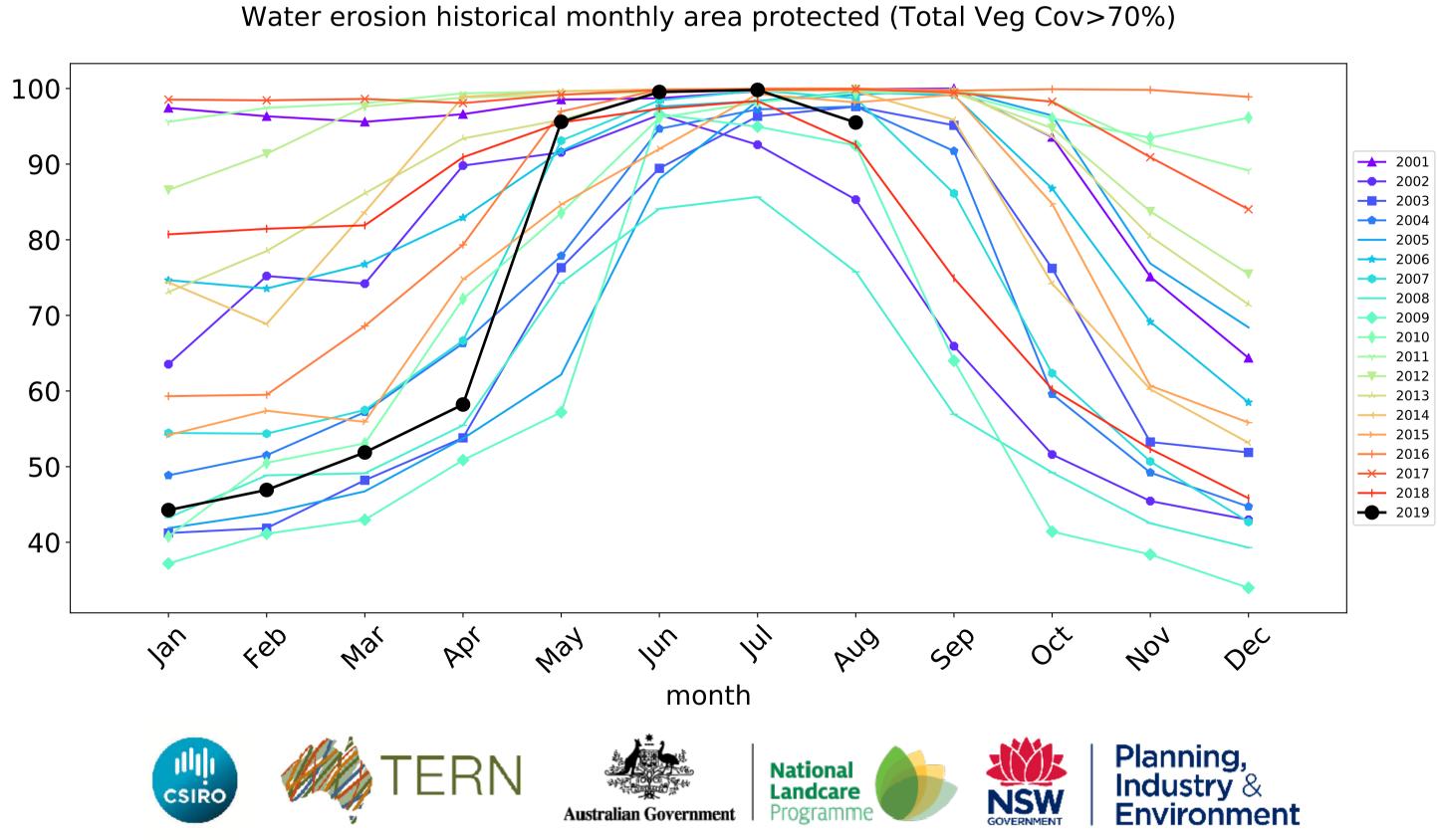


### **Production native forests and plantation forests timeseries**









### Carrathool\_(A) (1,885,800 ha and no data 7,096 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	1,885,800	99.8% 1,882,950	97.3% 1,835,425	71.8% 1,353,950	41.4% 781,325	15.8% 297,575	9.0% 169,525
Conservation and natural environments	143,320	100.0% 143,320	99.9% 143,221	90.2% 129,334	54.1% 77,516	7.5% 10,749	1.3% 1,927
Conservation and natural environments non forest	50,916	100.0% 50,916	99.8% 50,818	73.9% 37,630	24.4% 12,404	3.5% 1,786	0.7% 367
Conservation and natural environments Woodland forest	73,546	100.0% 73,546	100.0% 73,546	99.6% 73,246	76.6% 56,333	10.9% 8,044	2.0% 1,473
Conservation and natural environments Forest (non woodland)	18,858	100.0% 18,858	100.0% 18,858	98.6% 18,590	48.4% 9,124	5.2% 973	0.5% 97
Agriculture	1,687,791	99.8% 1,685,037	97.1% 1,638,606	70.0% 1,181,478	40.4% 681,774	16.6% 280,489	9.9% 166,301
Grazing	1,065,477	99.7% 1,062,785	96.3% 1,025,904	62.4% 664,739	26.1% 277,682	3.9% 41,940	1.0% 10,516
Grazing non forest	931,585	99.7% 928,891	95.8% 892,033	57.5% 535,544	21.4% 199,279	3.0% 28,130	0.7% 6,833
Grazing Woodland forest	98,061	100.0% 98,061	99.9% 98,012	97.3% 95,460	66.9% 65,638	13.2% 12,904	3.7% 3,665
Grazing - Forest (non woodland)	35,830	100.0% 35,830	100.0% 35,830	93.4% 33,468	34.8% 12,482	2.4% 845	0.0%
Cropping	490,308	100.0% 490,283	98.7% 484,090	87.6% 429,725	73.4% 360,089	46.5% 228,230	30.8% 150,860
Irrigation	122,577	100.0% 122,552	97.5% 119,516	65.8% 80,606	32.8% 40,178	7.0% 8,608	3.2% 3,881
Production native forests and plantation forests	26,401	100.0% 26,401	100.0% 26,401	95.5% 25,213	56.3% 14,861	19.4% 5,115	4.6% 1,212











