LGA Busselton_(C) (WA) - 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.

Busselton_(C)

- 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:

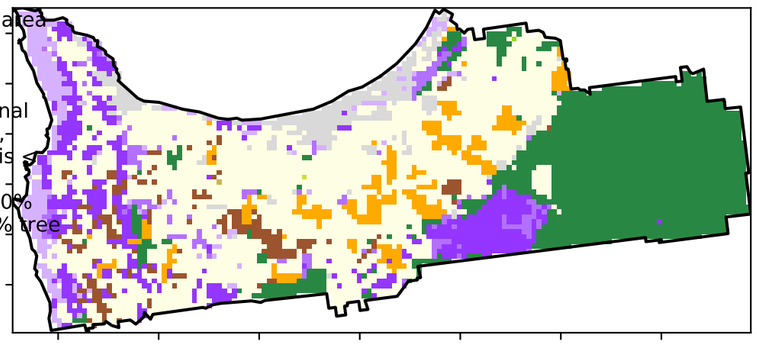
1. http://www.agriculture.gov.au/abares/aclump/land-use/alum-classification
2. http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018
3. https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/establishment-mgmt/production-management2/groundcover
4. MODIS Fractional cover algorithm:

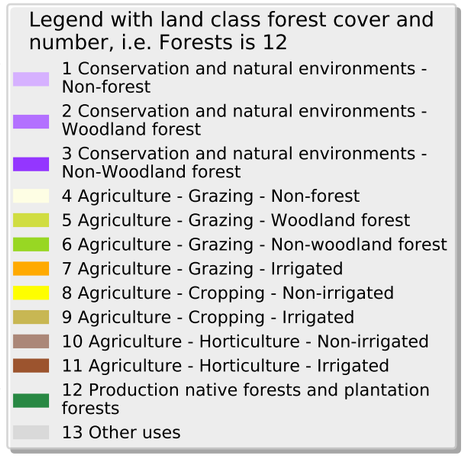
   https://doi.org/10.4225/08/5848a3f19a7b3

Vegetation Cover Aug 2019

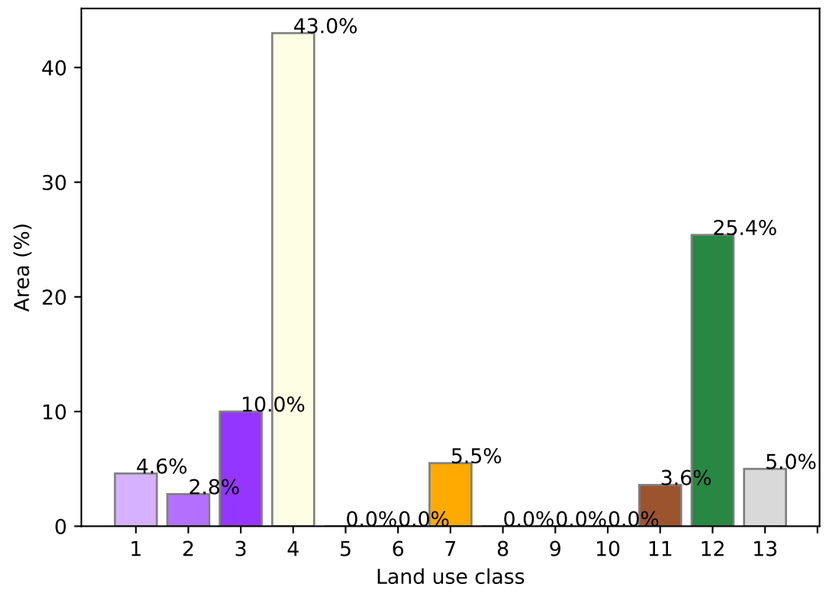
Land use and forest cover

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

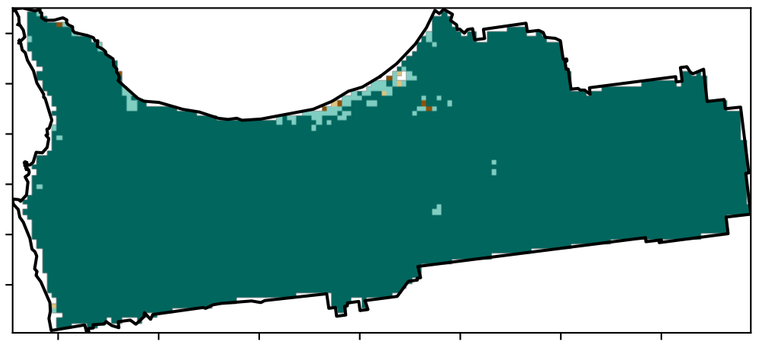


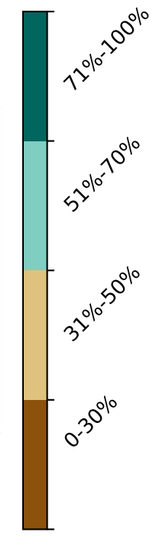


Proportion of each land class in area

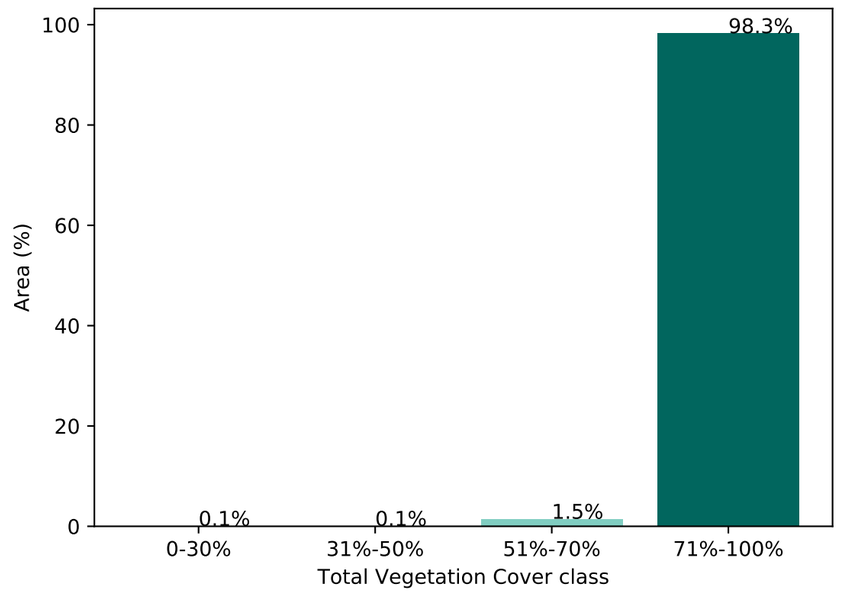


Total Vegetation Cover [%]

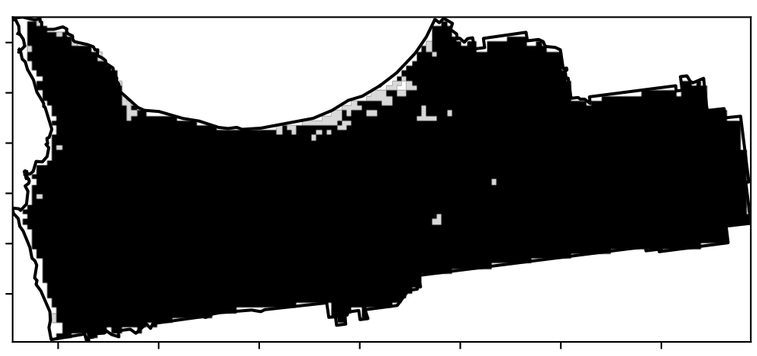


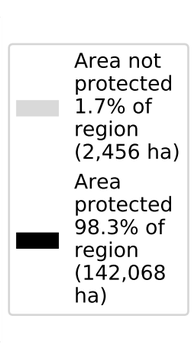


Proportion of vegetation cover class in area

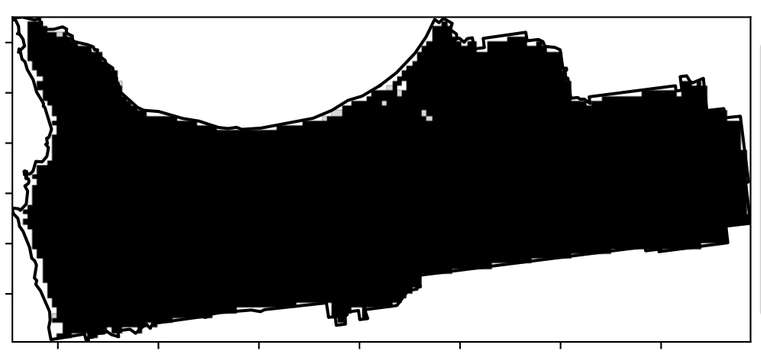


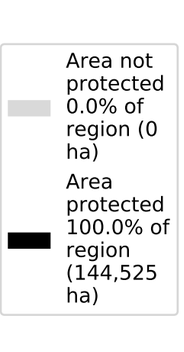
% Area protected from water erosion (>70%)





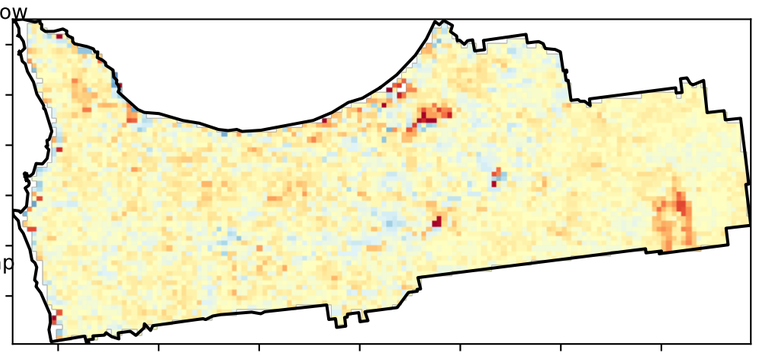
% Area protected from wind erosion (>50%)

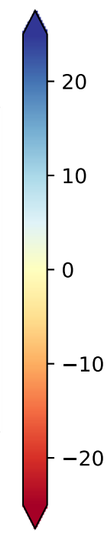




Total Vegetation Cover Anomaly [%]

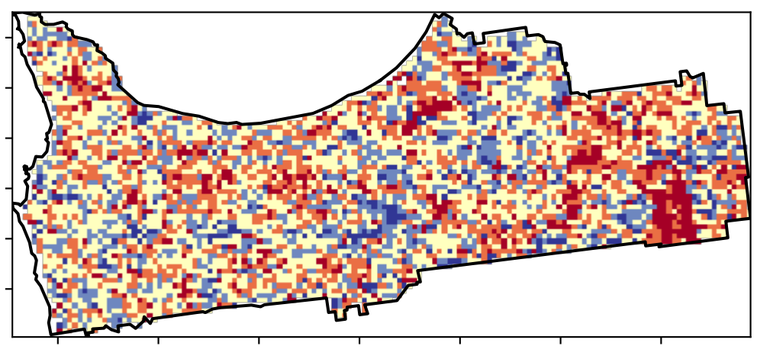
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

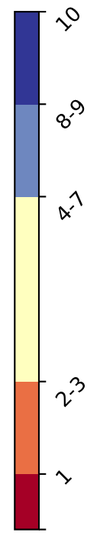


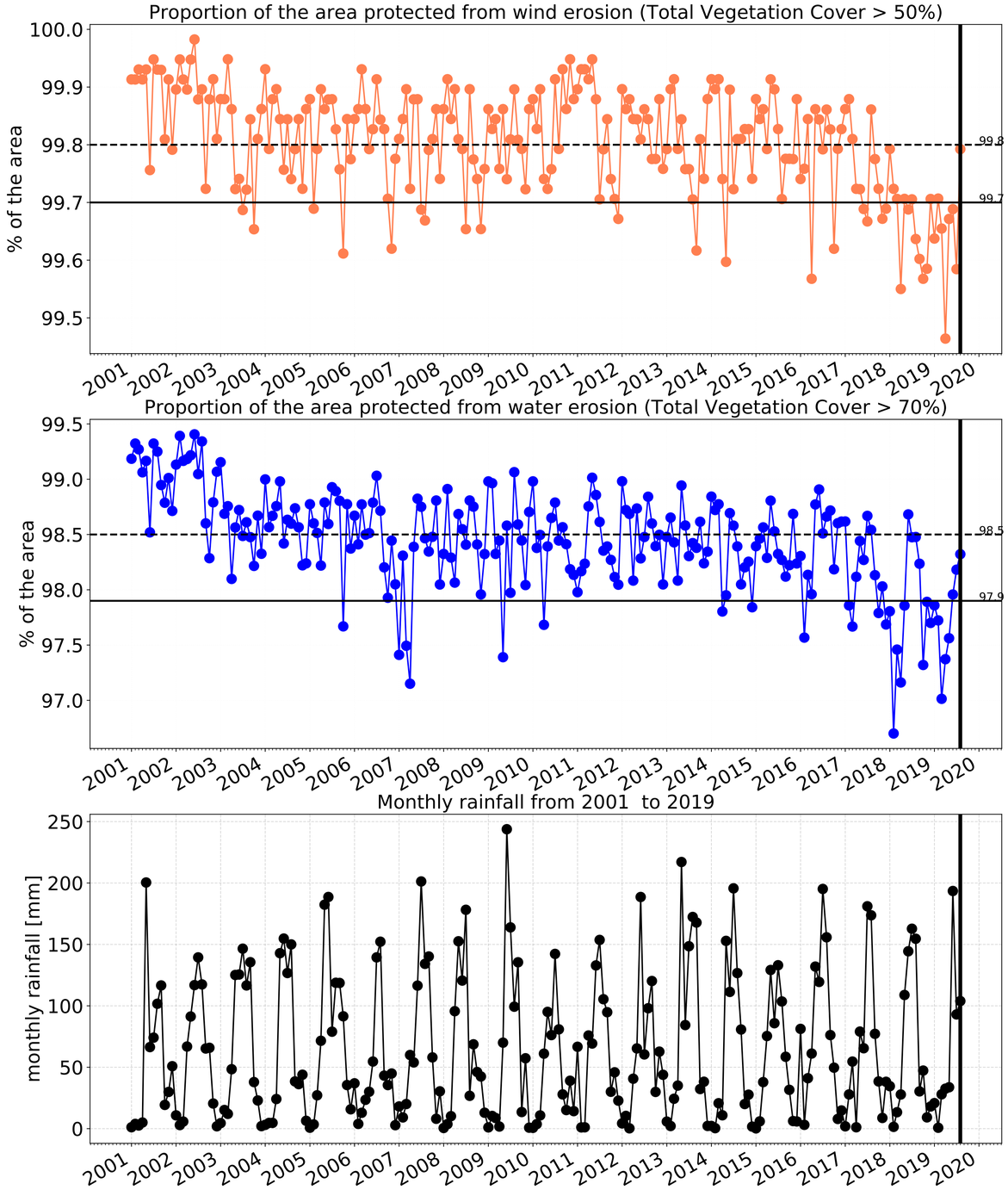


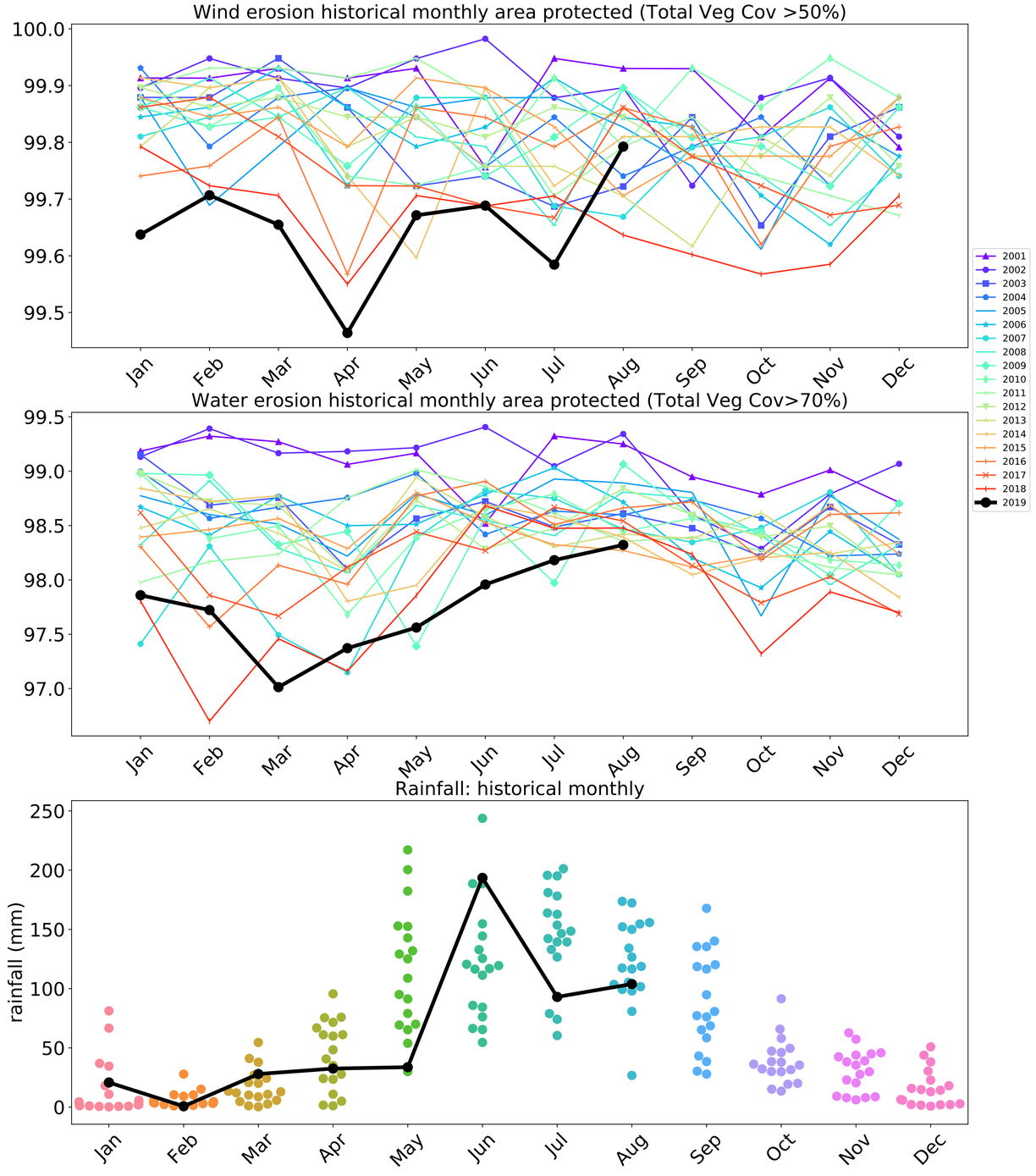
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

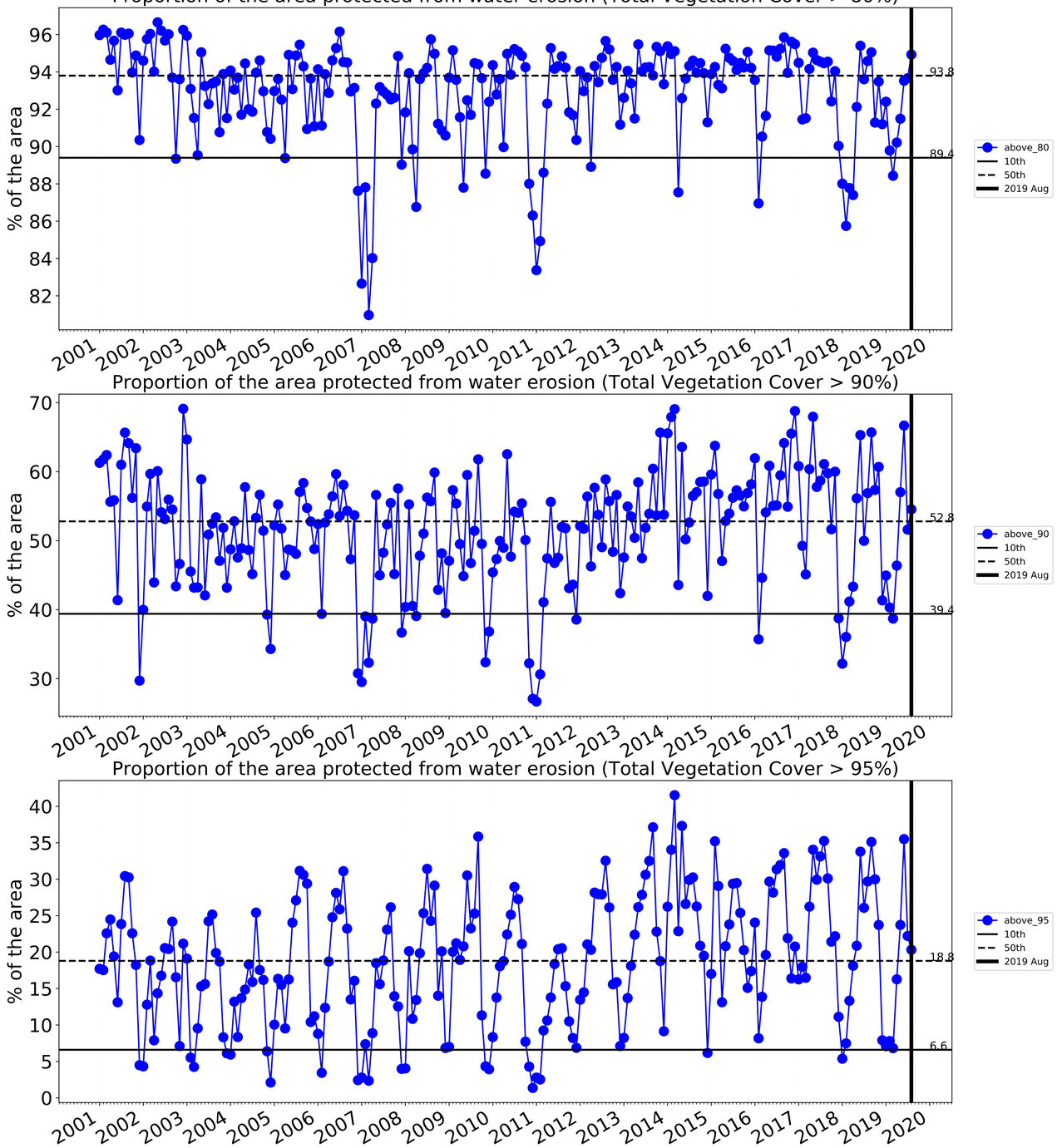
Total Vegetation Cover Decile [%]

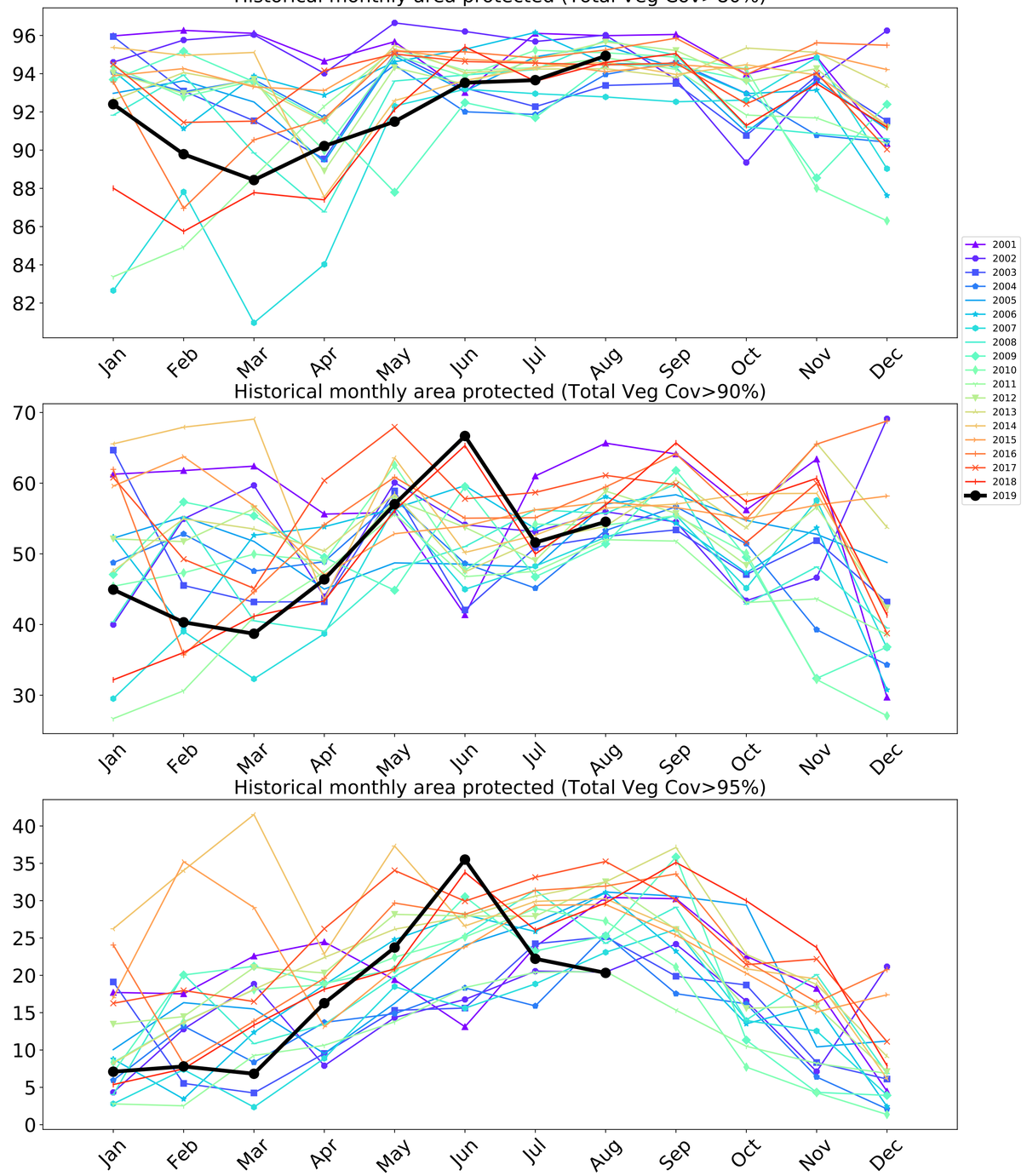





Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)
% of the area
100.0
99.9
99.8
99.7
99.6
99.5
99.8
99.7
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
above_50
10th
50th
2019 Aug
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)
% of the area
99.5
99.0
98.5
98.0
97.5
97.0
98.5
97.9
above_70
10th
50th
2019 Aug
Monthly rainfall from 2001 to 2019
monthly rainfall [mm]
250
200
150
100
50
0


Wind erosion historical monthly area protected (Total Veg Cov >50%)
100.0
99.9
99.8
99.7
99.6
99.5
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Water erosion historical monthly area protected (Total Veg Cov>70%)
99.5
99.0
98.5
98.0
97.5
97.0
Rainfall: historical monthly
rainfall (mm)
250
200
150
100
50
0

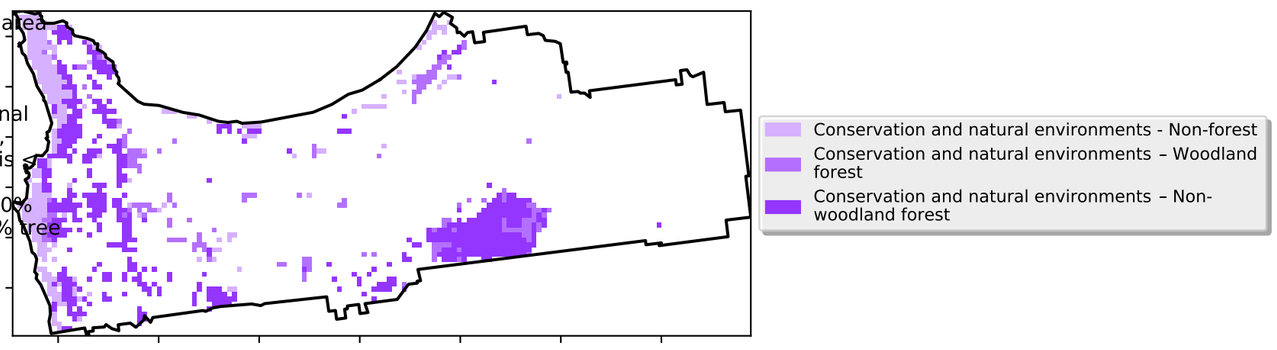

Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
93.8
89.4
above_80
10th
50th
2019 Aug
Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
52.8
39.4
above_90
10th
50th
2019 Aug
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
18.8
6.6
above_95
10th
50th
2019 Aug


Historical monthly area protected (Total Veg Cov>80%)
Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019

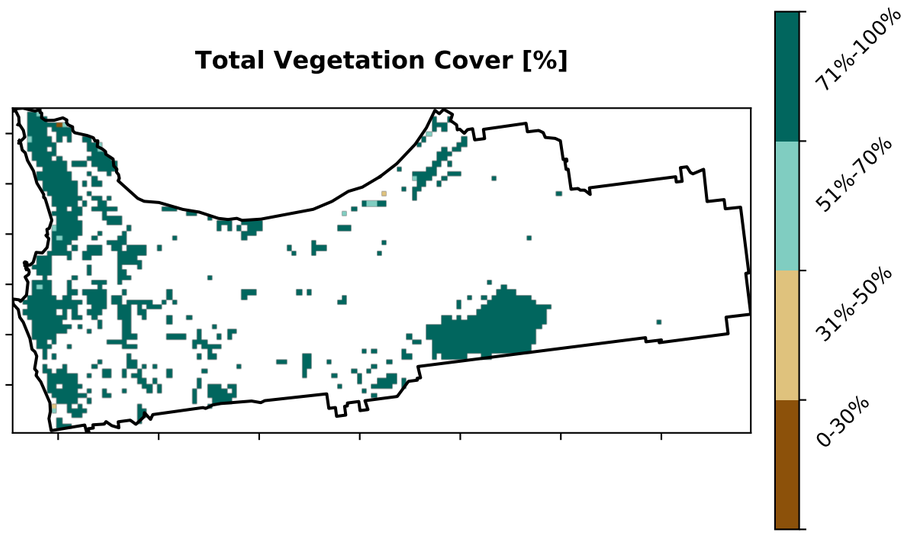
Conservation and natural environments

Land use and forest cover

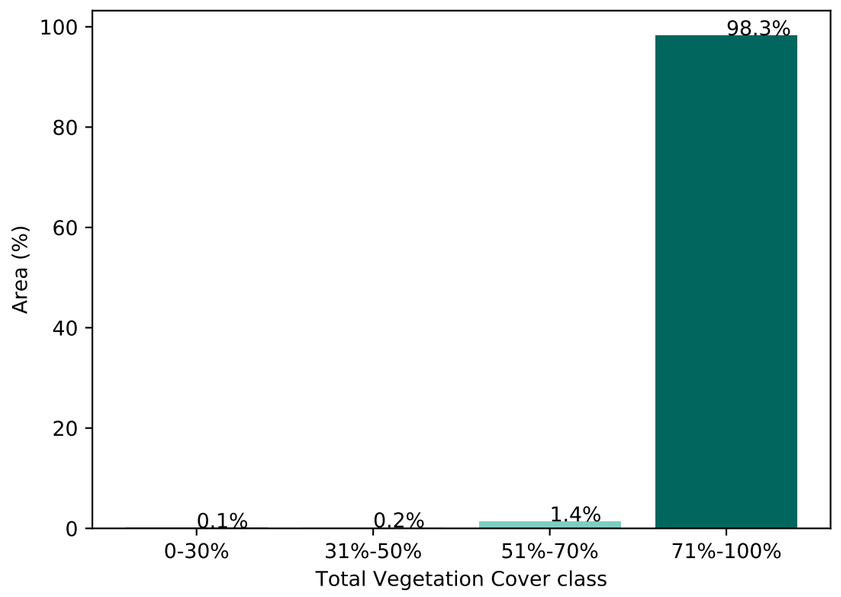
Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.



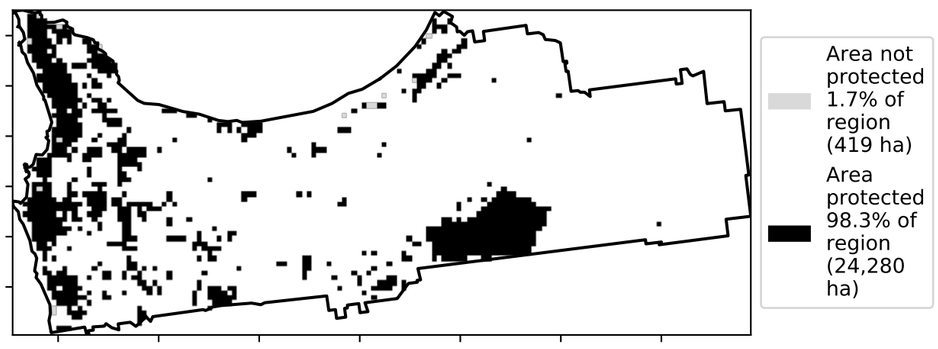
Total Vegetation Cover [%]



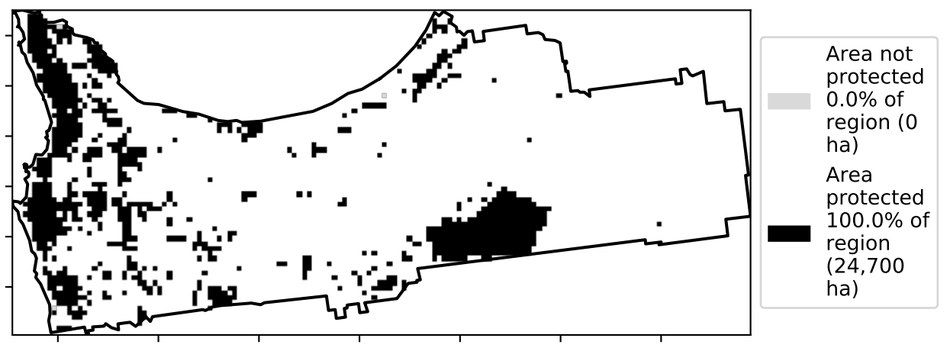
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

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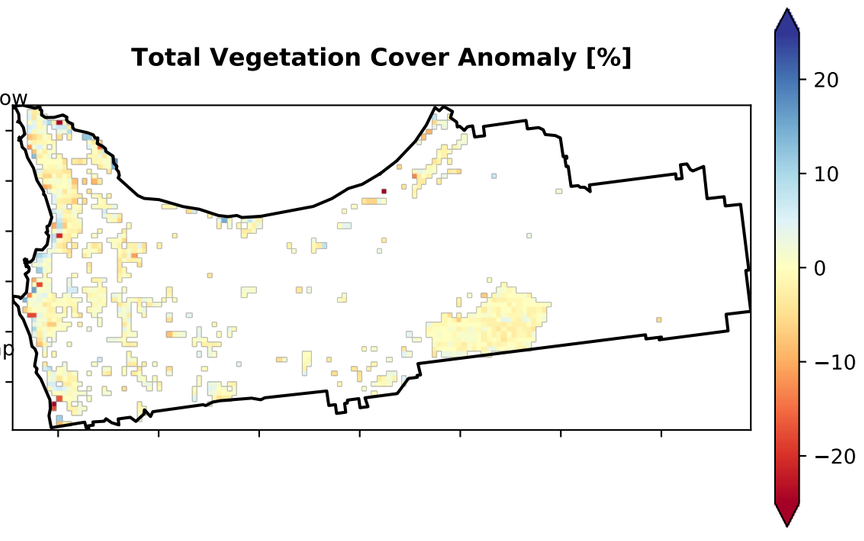
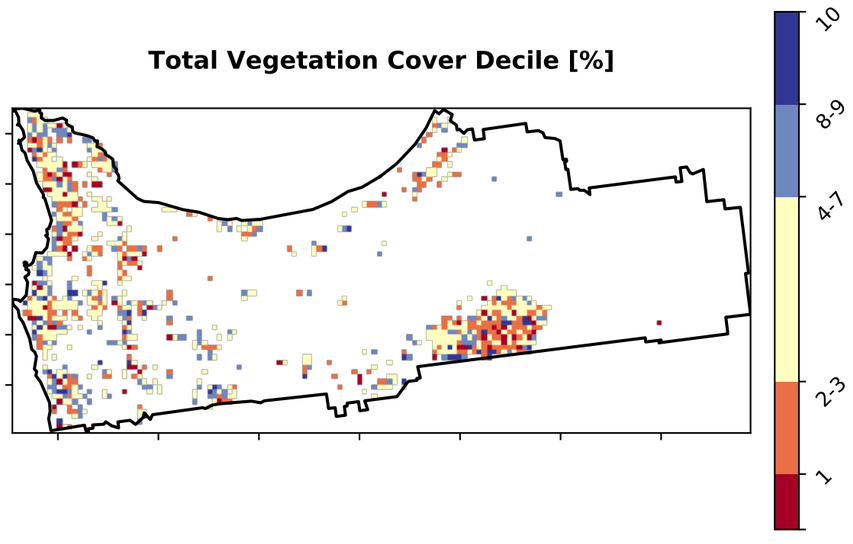


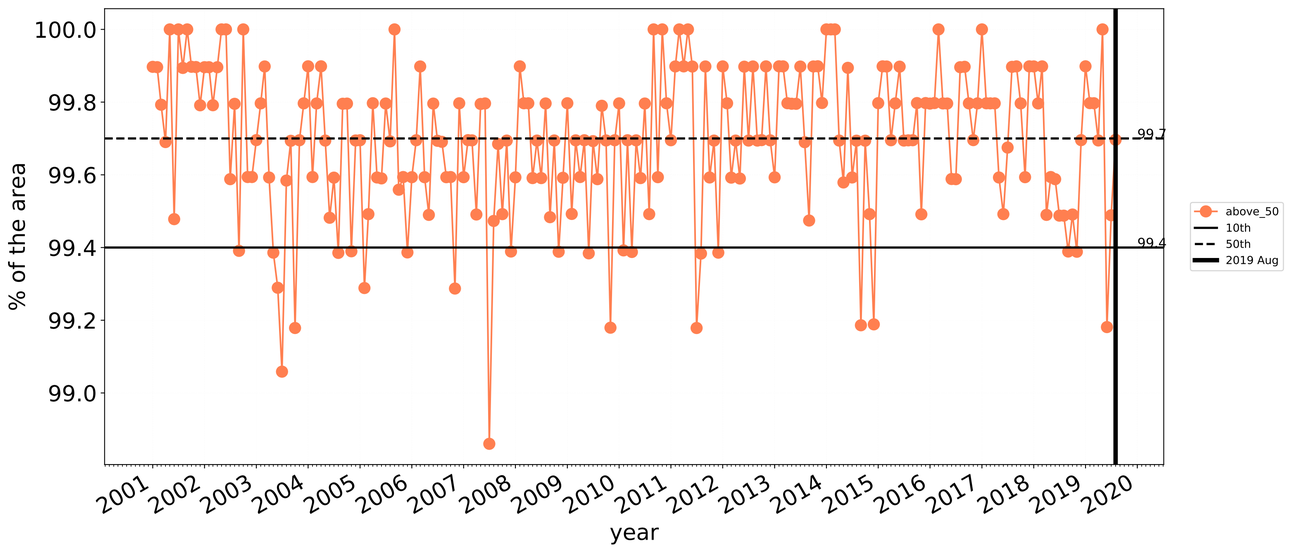
Total Vegetation Cover Decile [%]

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.

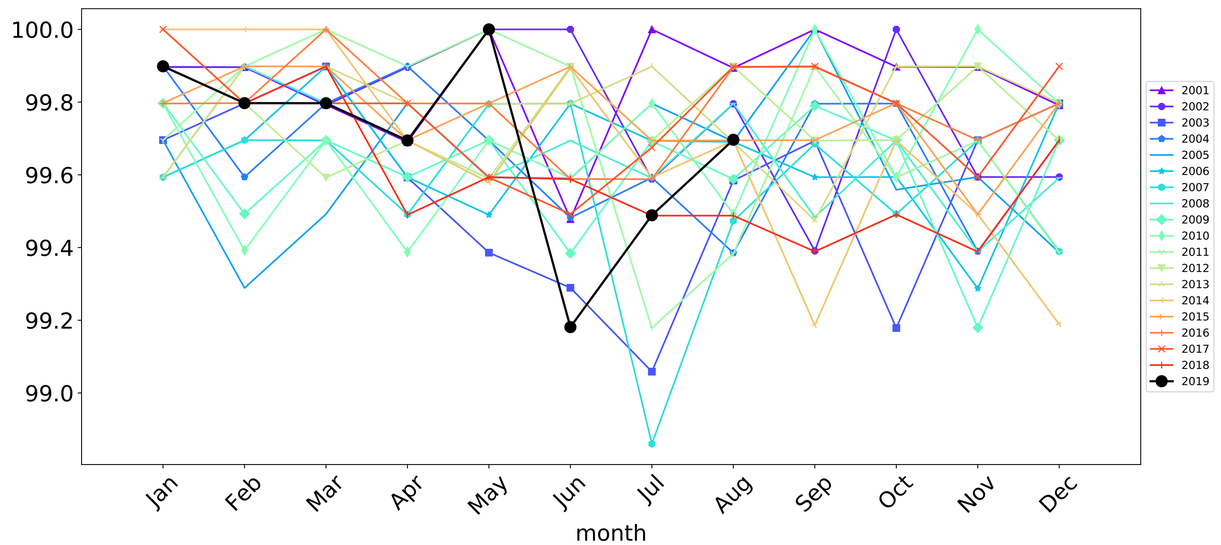


Conservation and natural environments timeseries

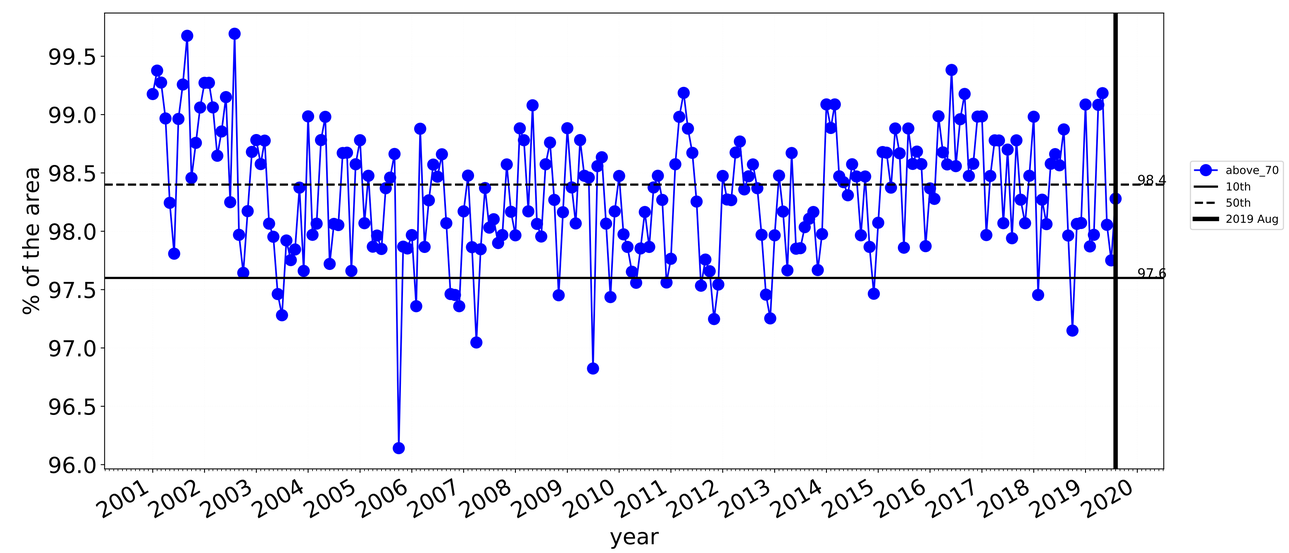
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



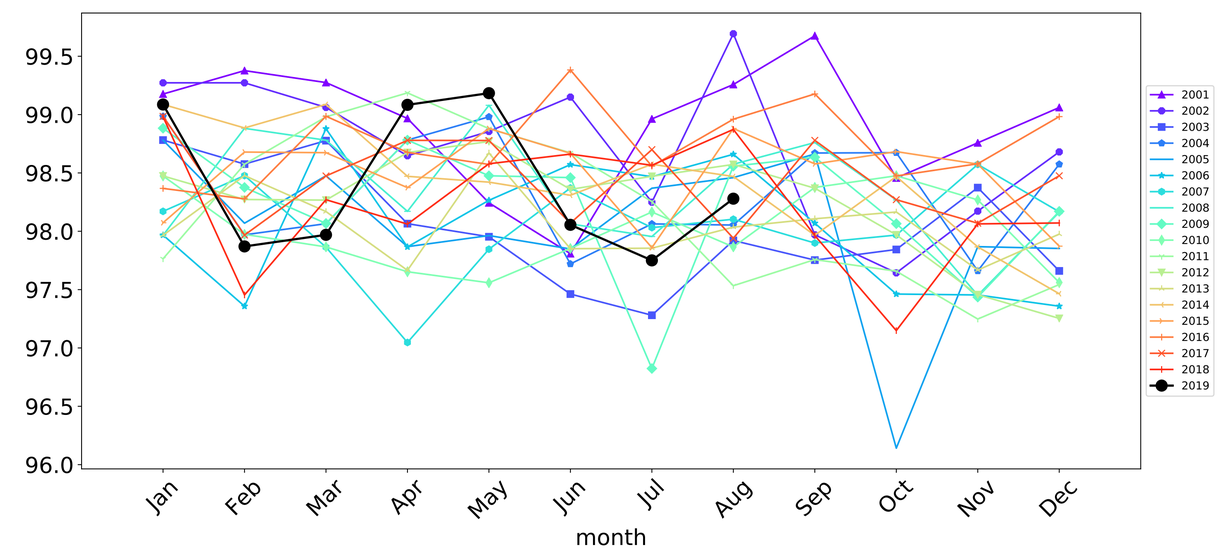
Wind erosion historical monthly area protected (Total Veg Cov >50%)

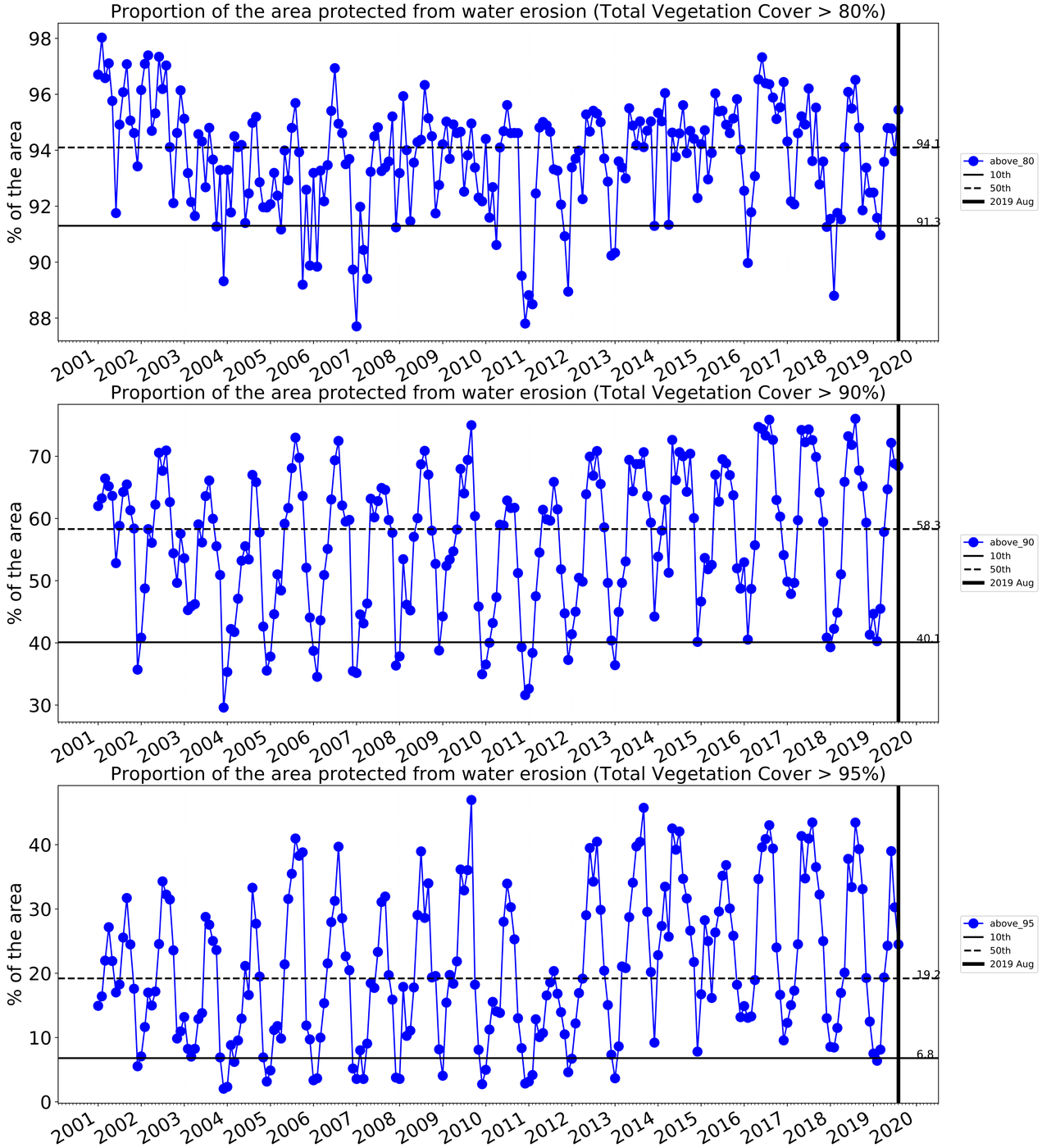


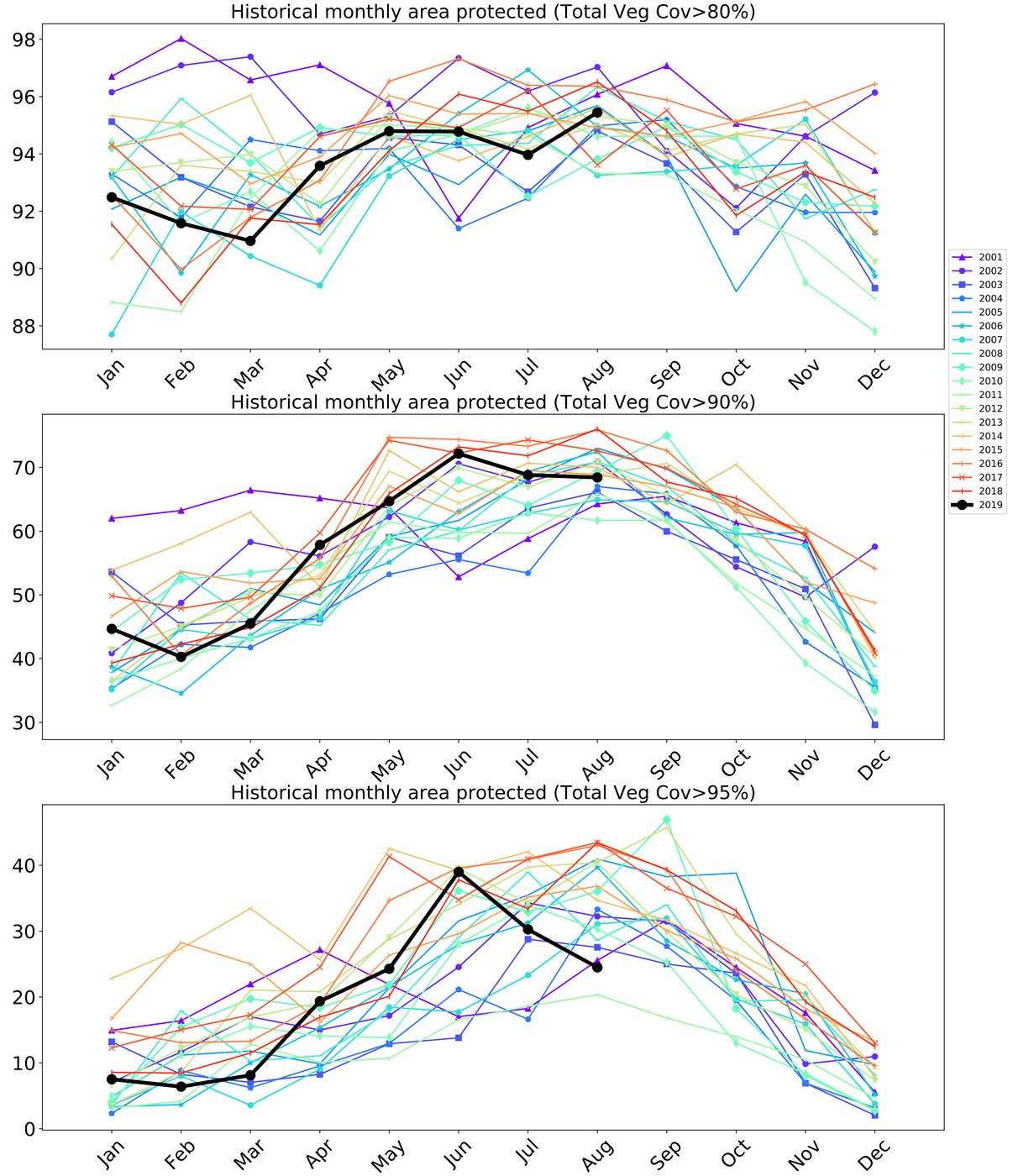
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
94.1
91.3
above_80
10th
50th
2019 Aug


Historical monthly area protected (Total Veg Cov>80%)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019

Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
58.3
40.1
above_90
10th
50th
2019 Aug

Historical monthly area protected (Total Veg Cov>90%)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019

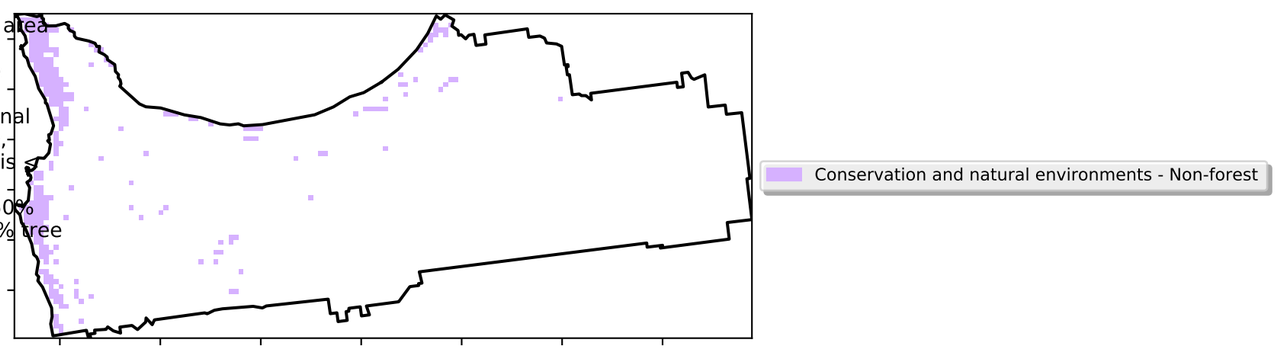
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
19.2
6.8
above_95
10th
50th
2019 Aug

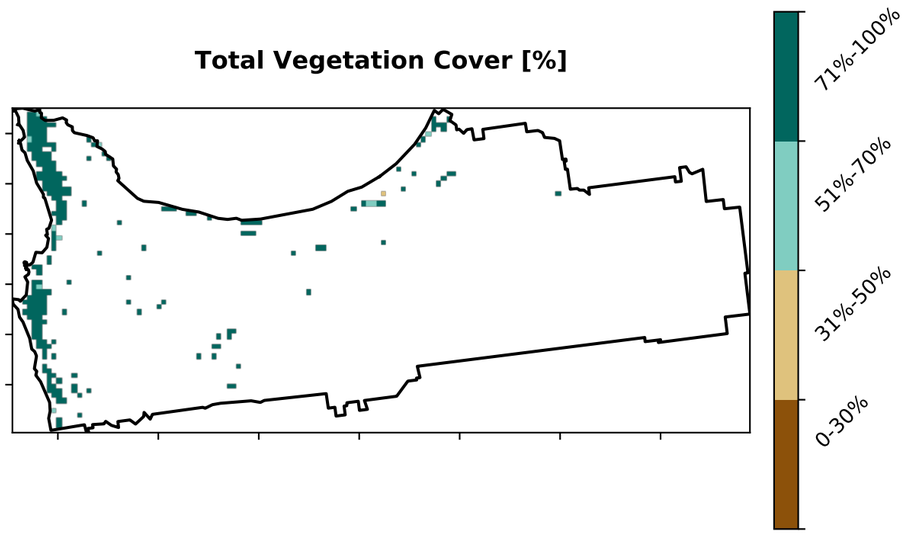
Historical monthly area protected (Total Veg Cov>95%)
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

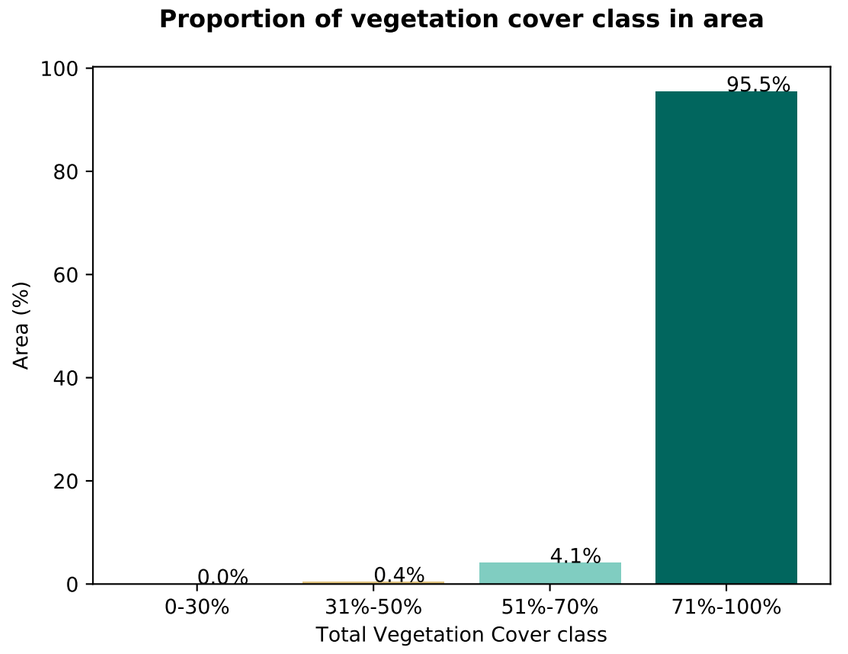
Conservation and natural environments non forest

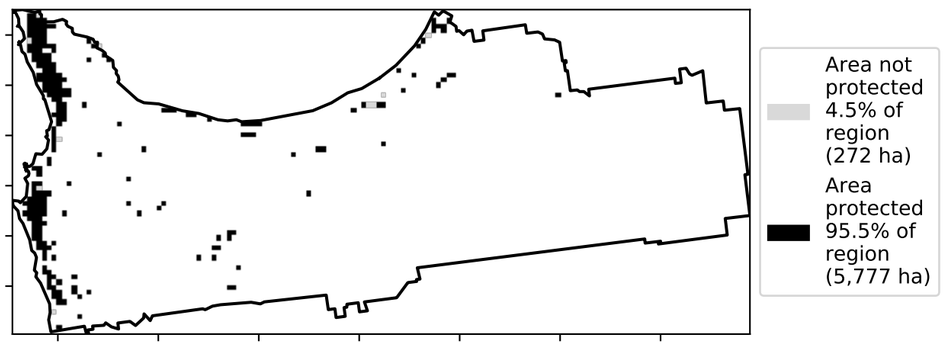
Land use and forest cover

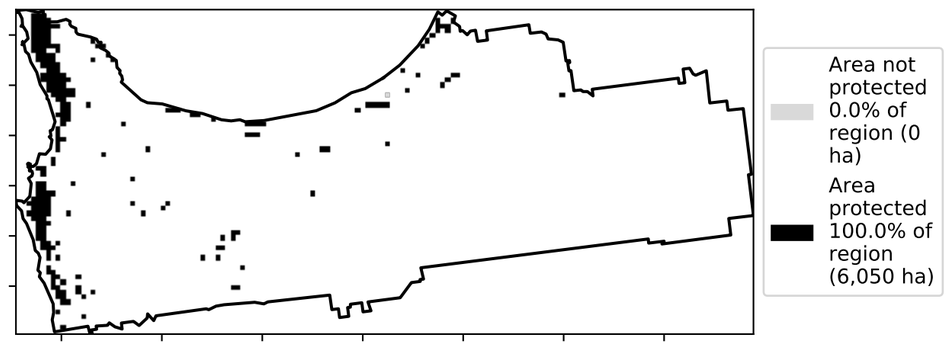
Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

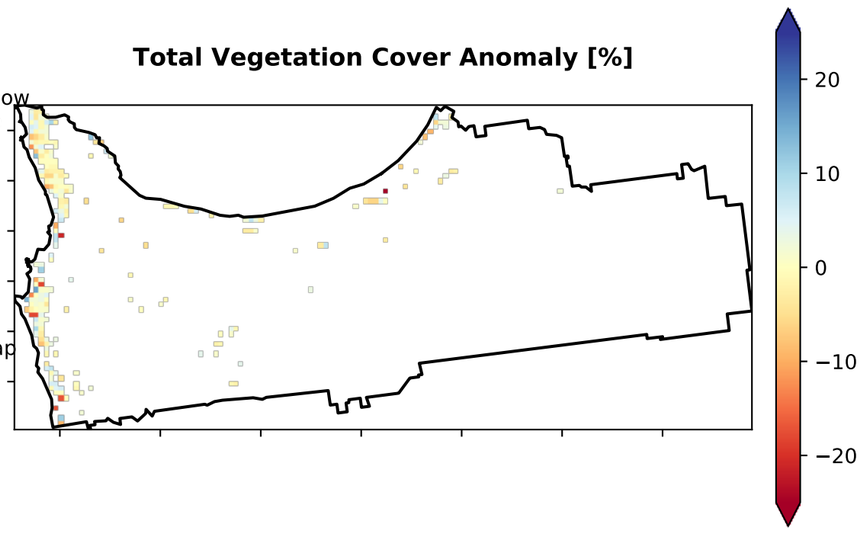




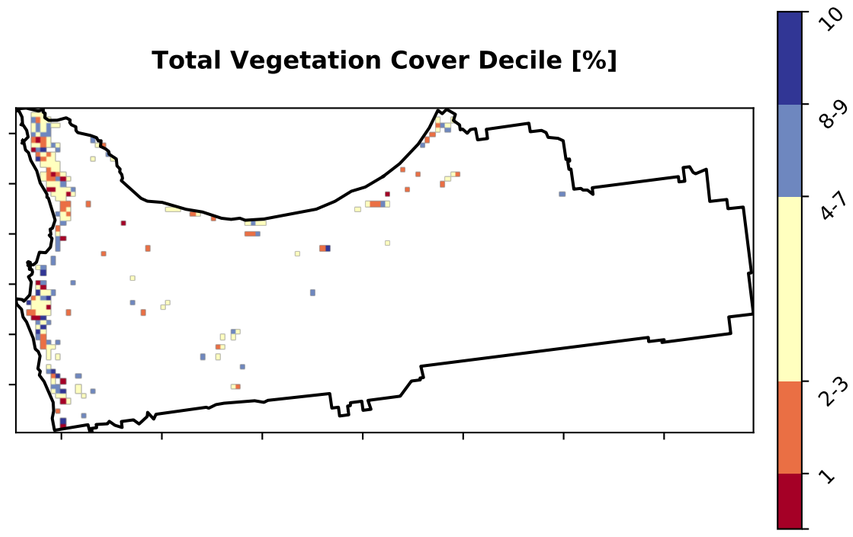








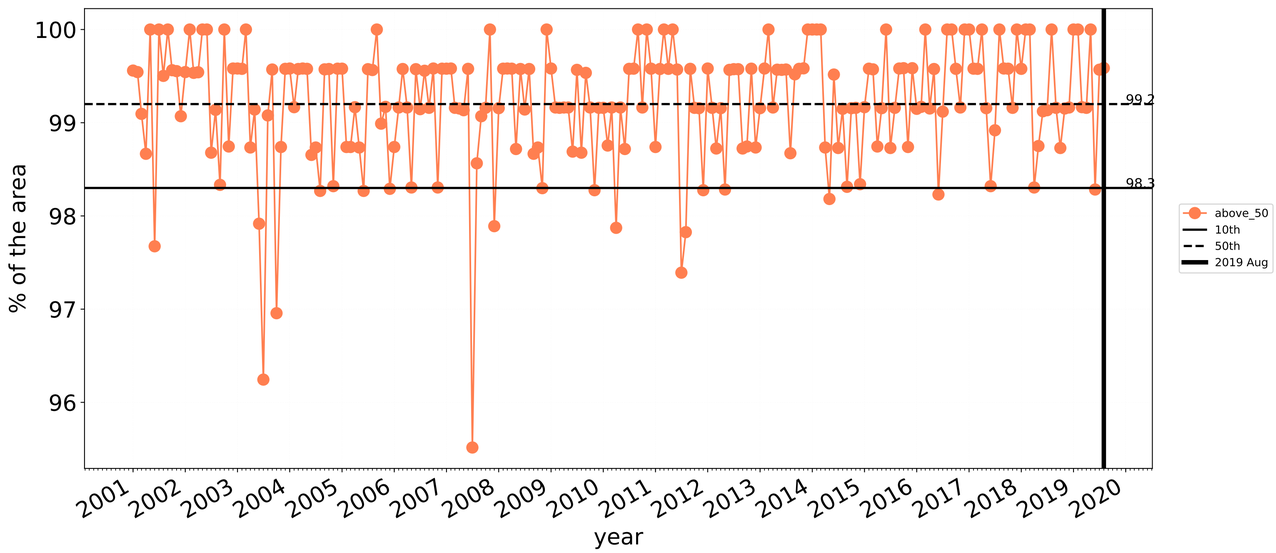
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



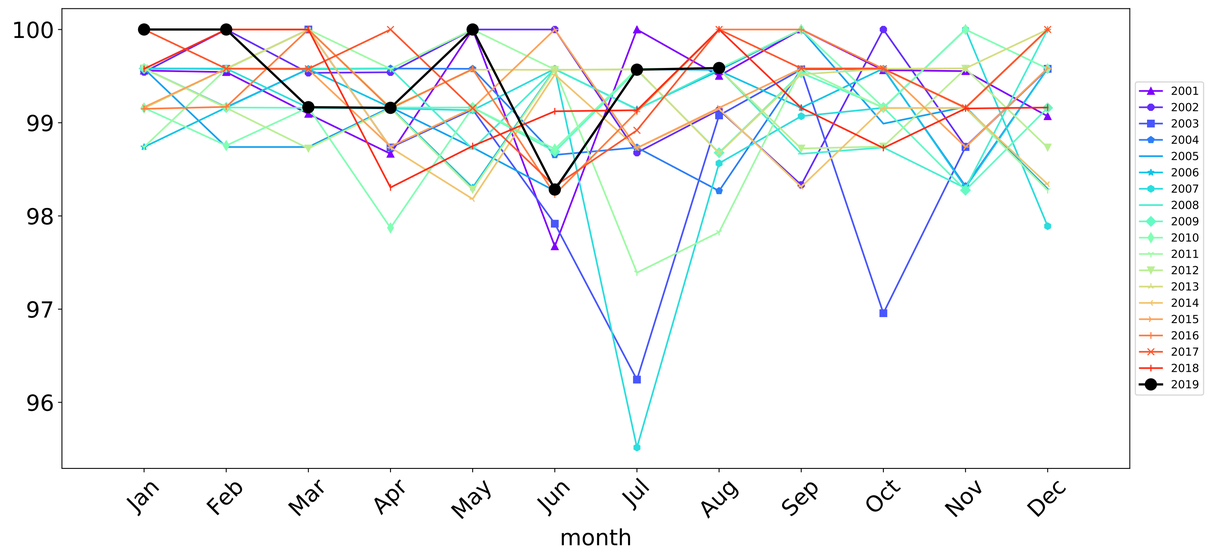
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Conservation and natural environments non forest timeseries

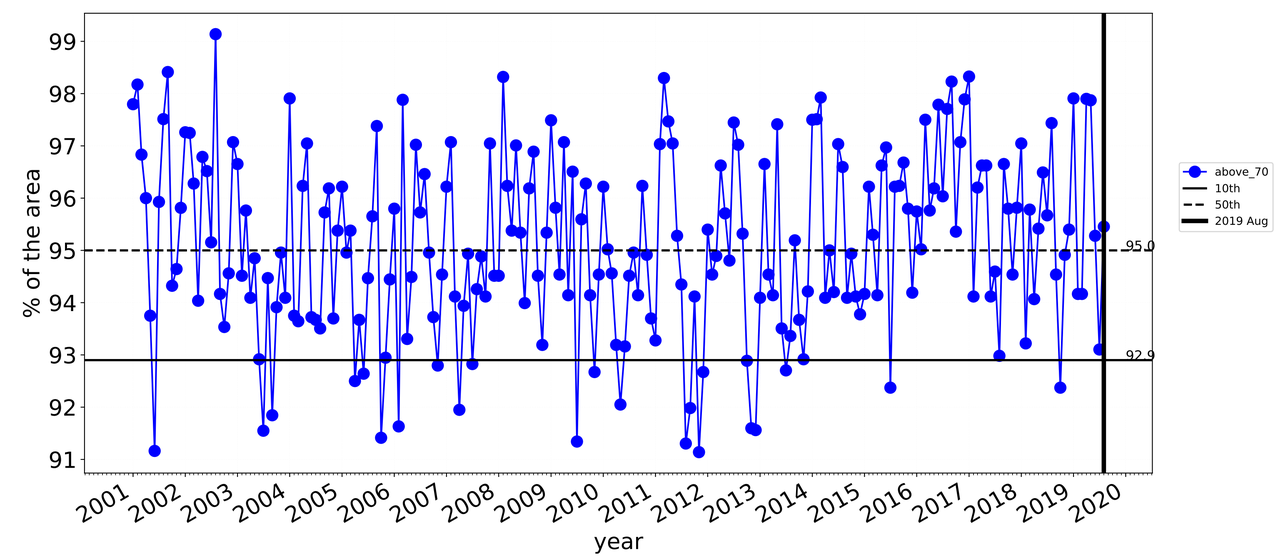
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



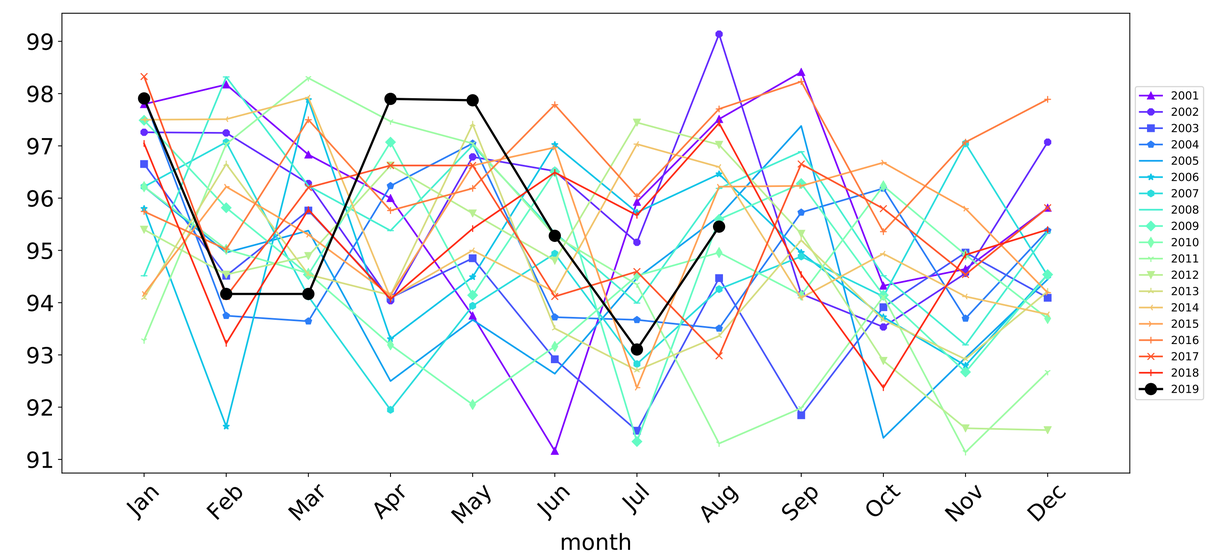
Wind erosion historical monthly area protected (Total Veg Cov >50%)



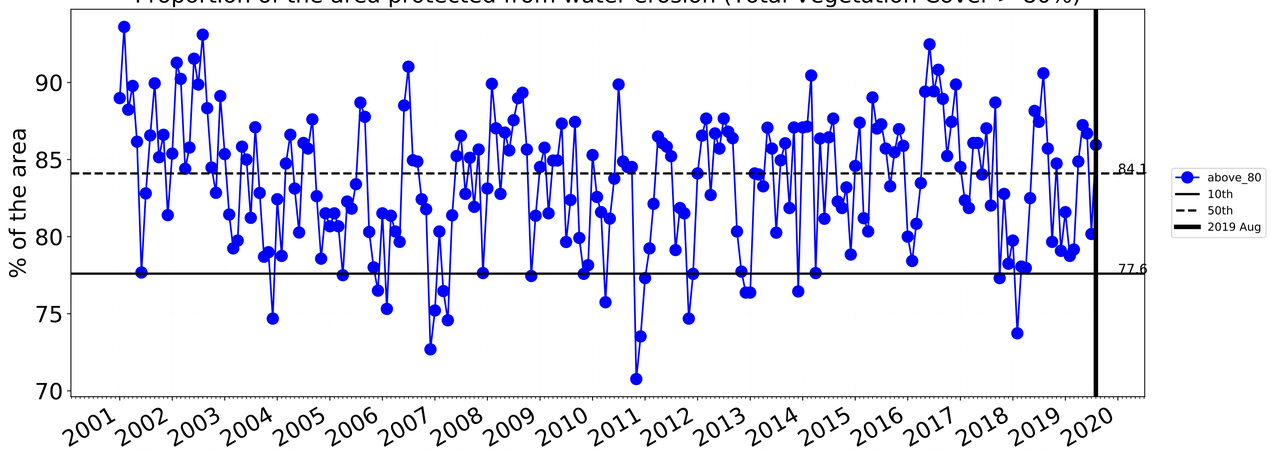
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



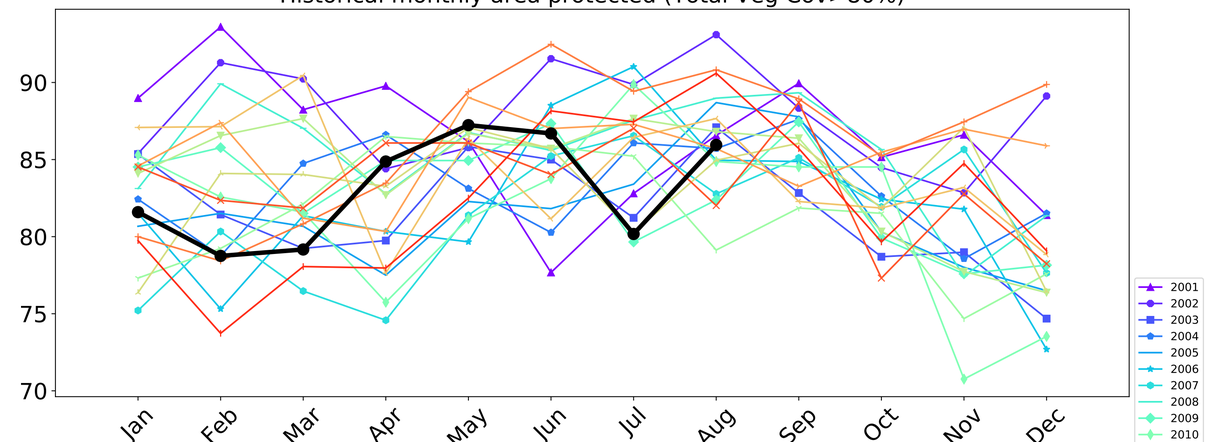
Water erosion historical monthly area protected (Total Veg Cov>70%)



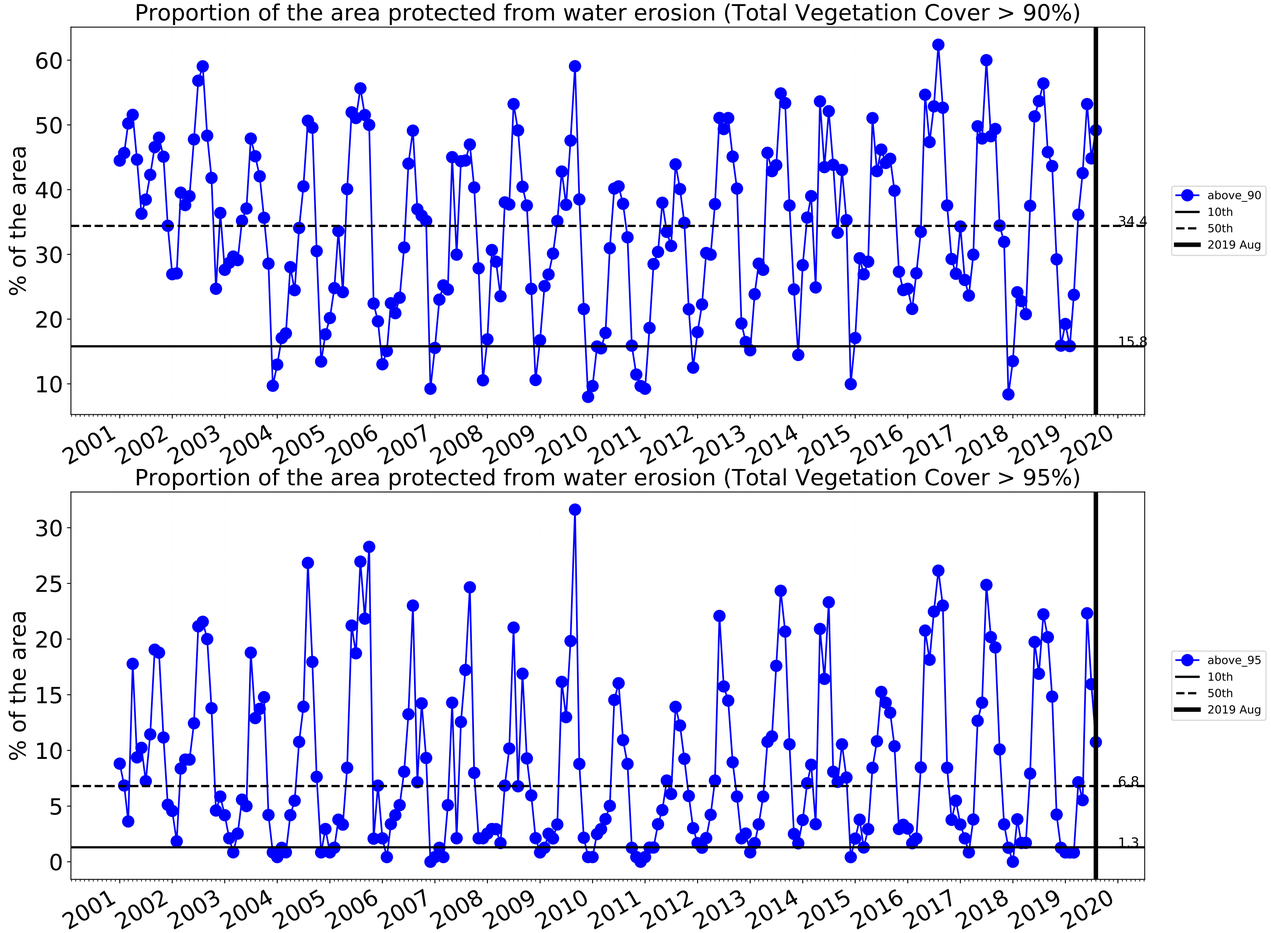
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



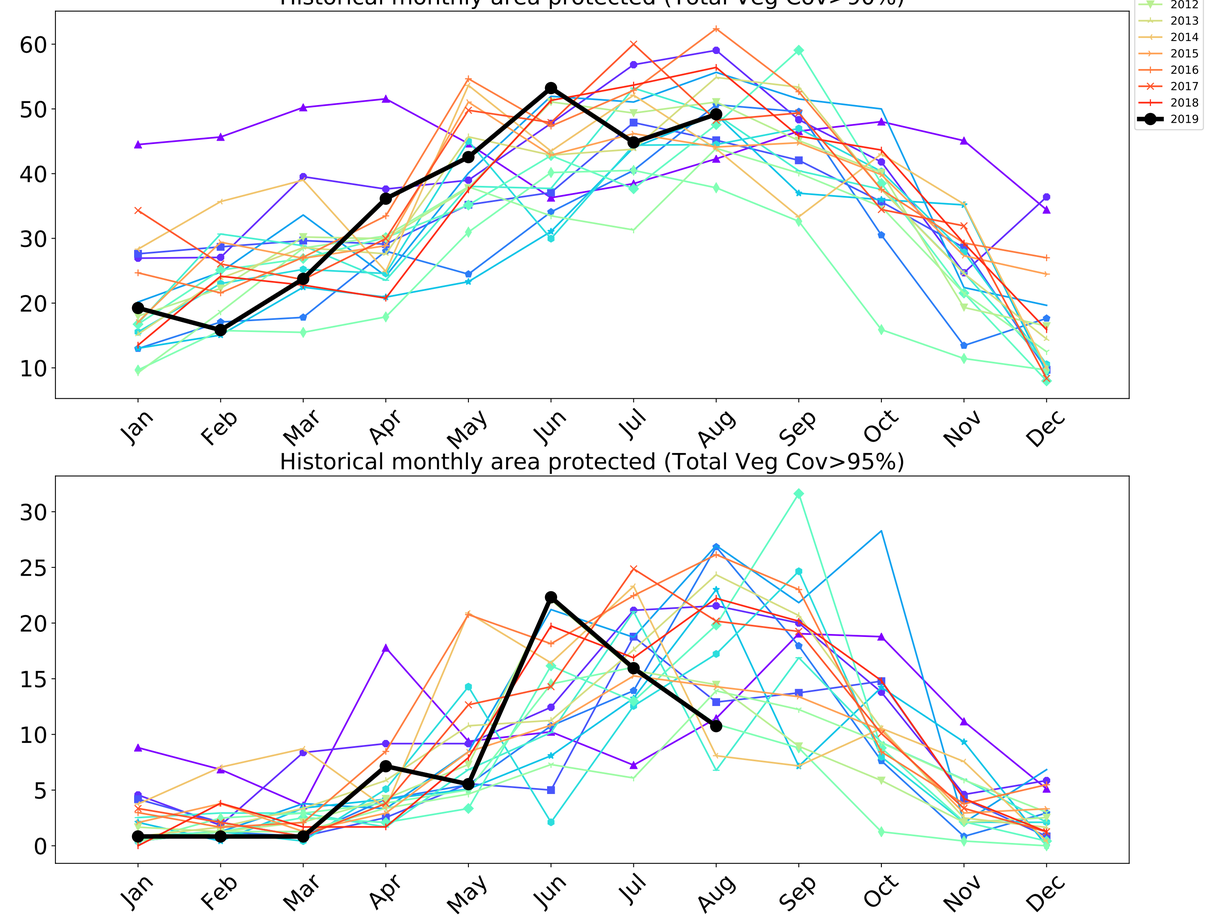
Historical monthly area protected (Total Veg Cov>80%)



Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)



Historical monthly area protected (Total Veg Cov>90%)



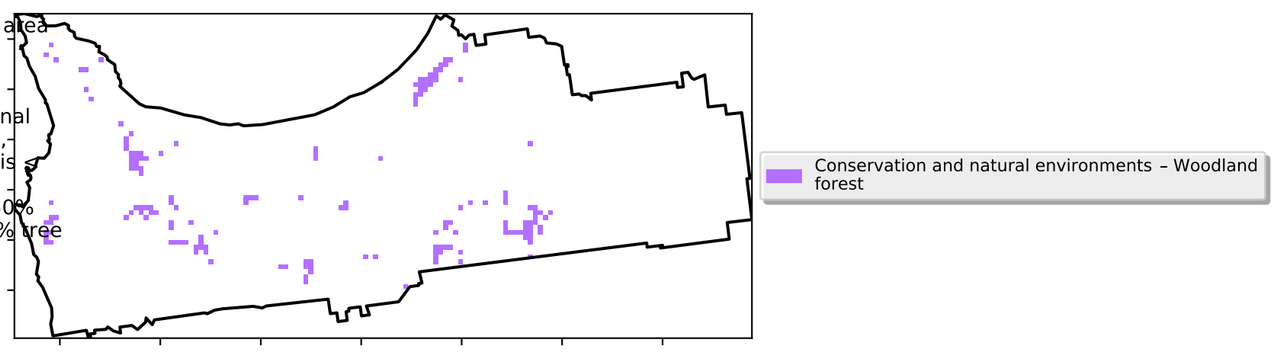
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)

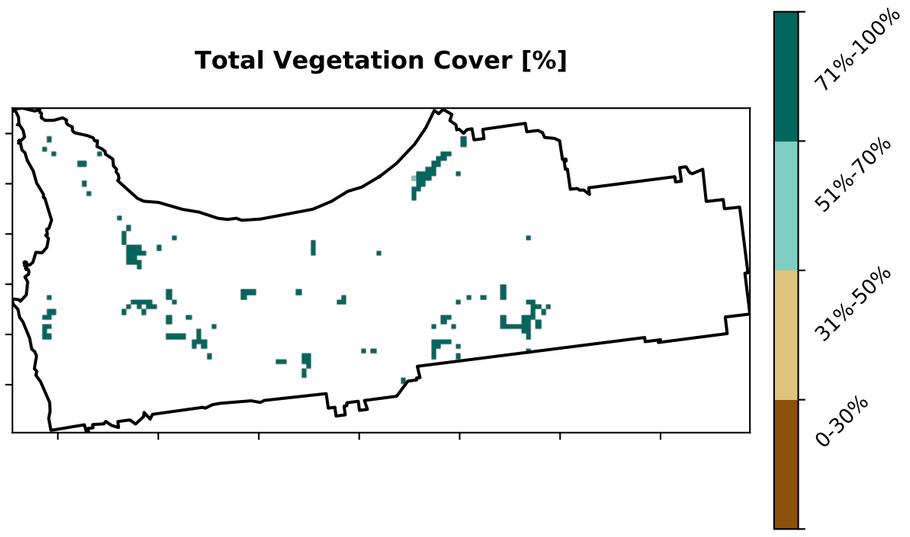
Historical monthly area protected (Total Veg Cov>95%)

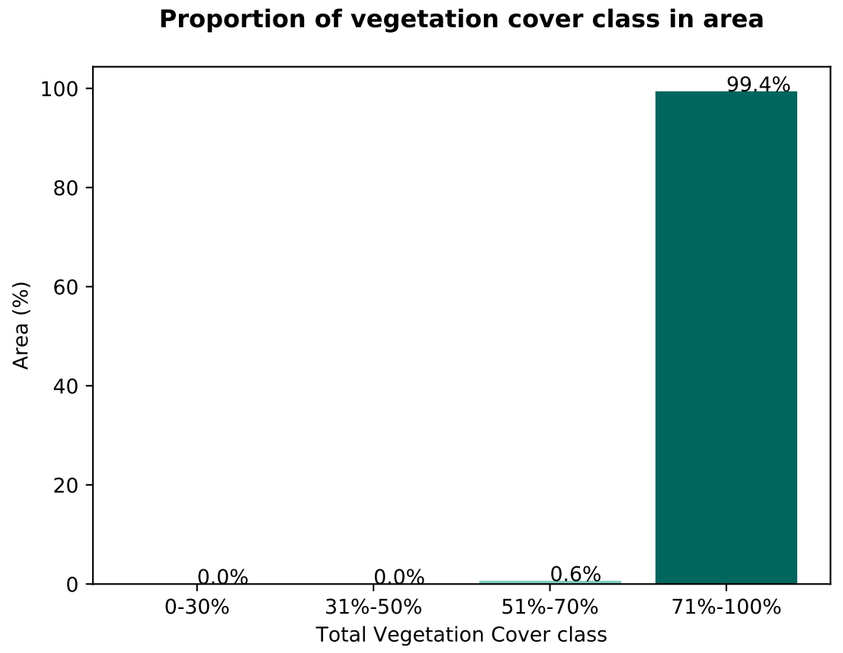
Conservation and natural environments Woodland forest

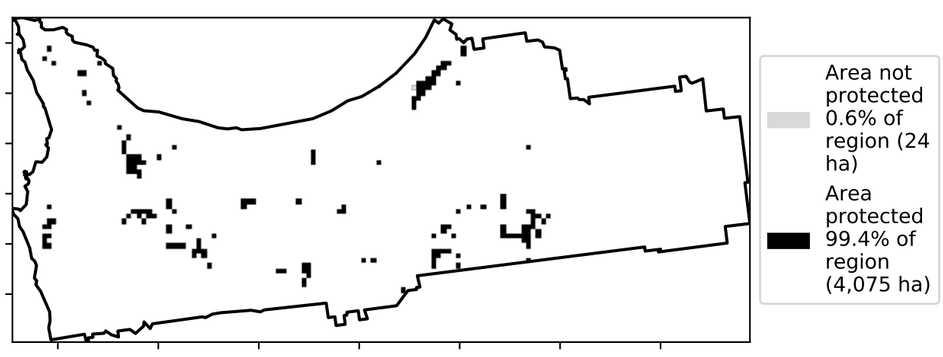
Land use and forest cover

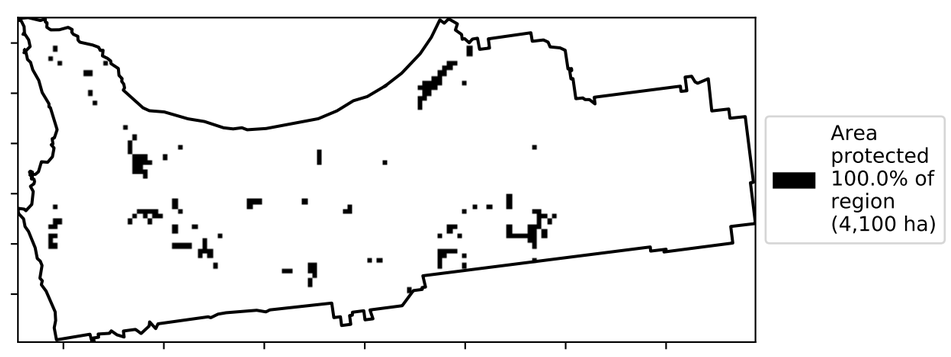
Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.

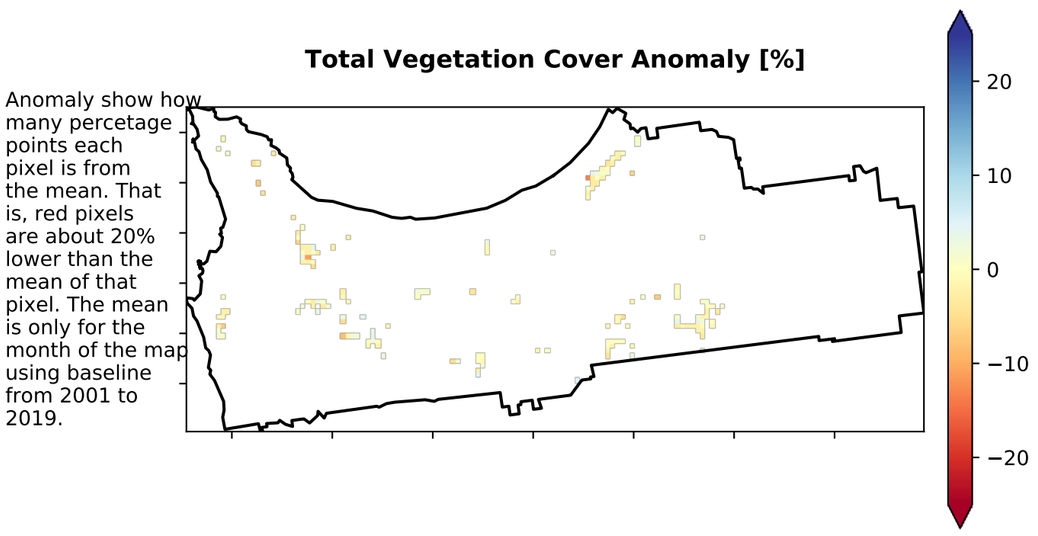






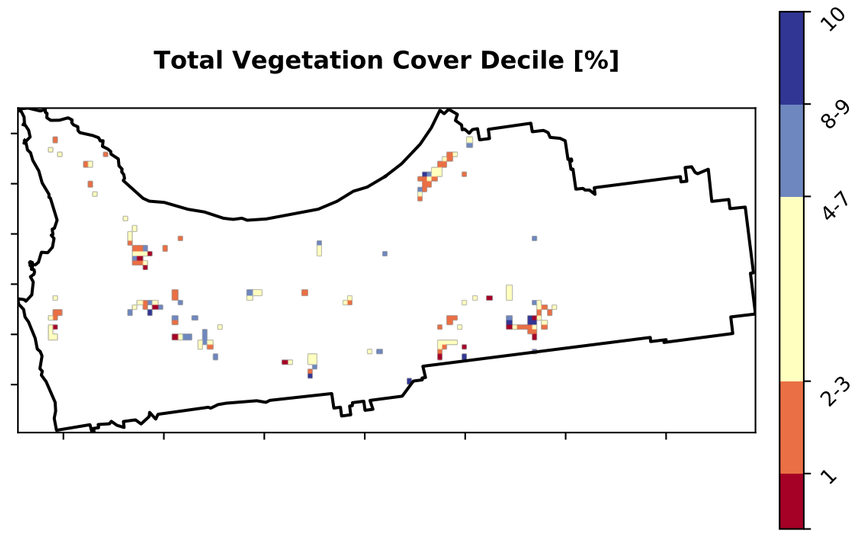






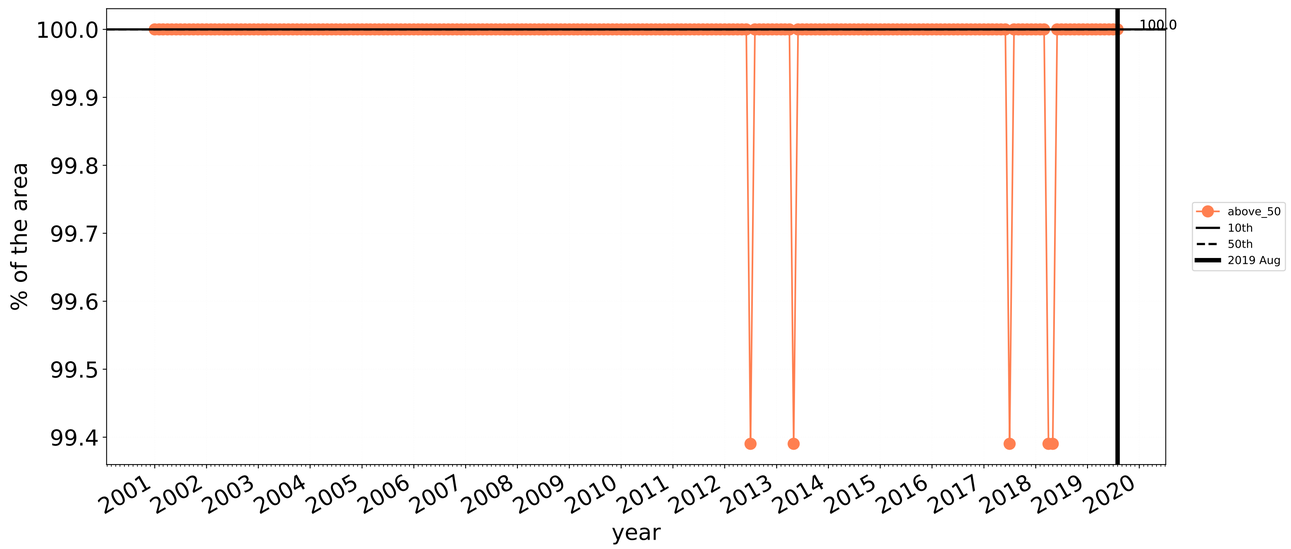
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

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

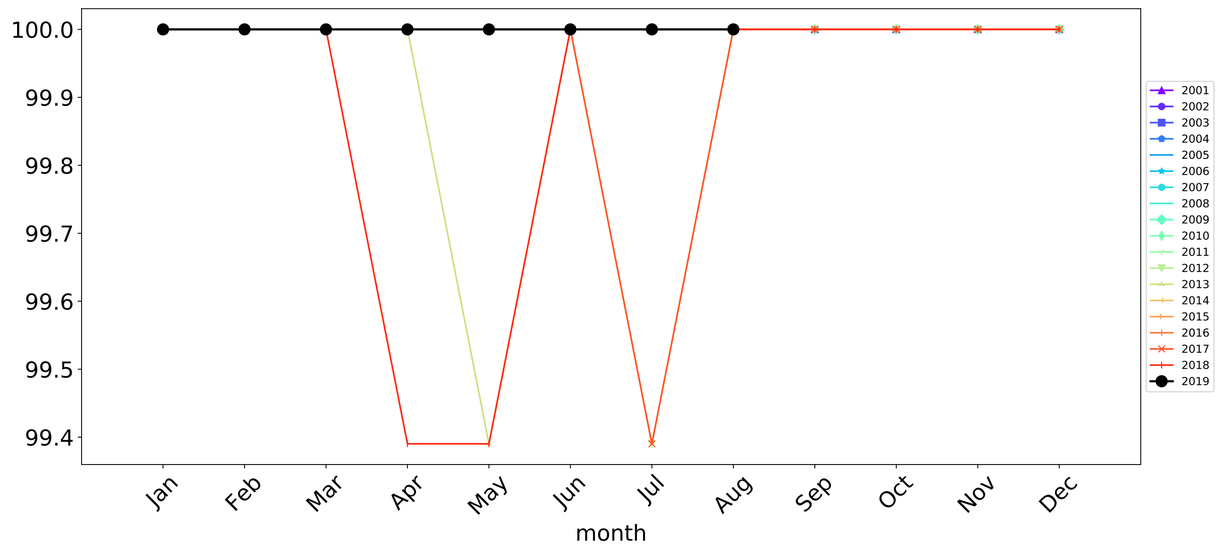


Conservation and natural environments Woodland forest timeseries

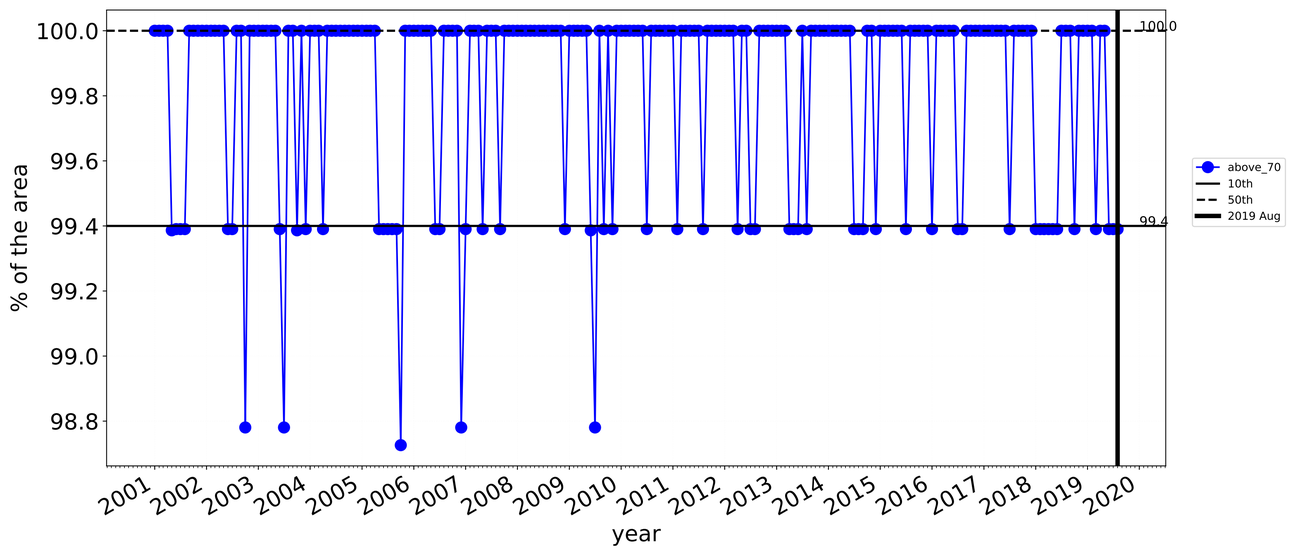
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



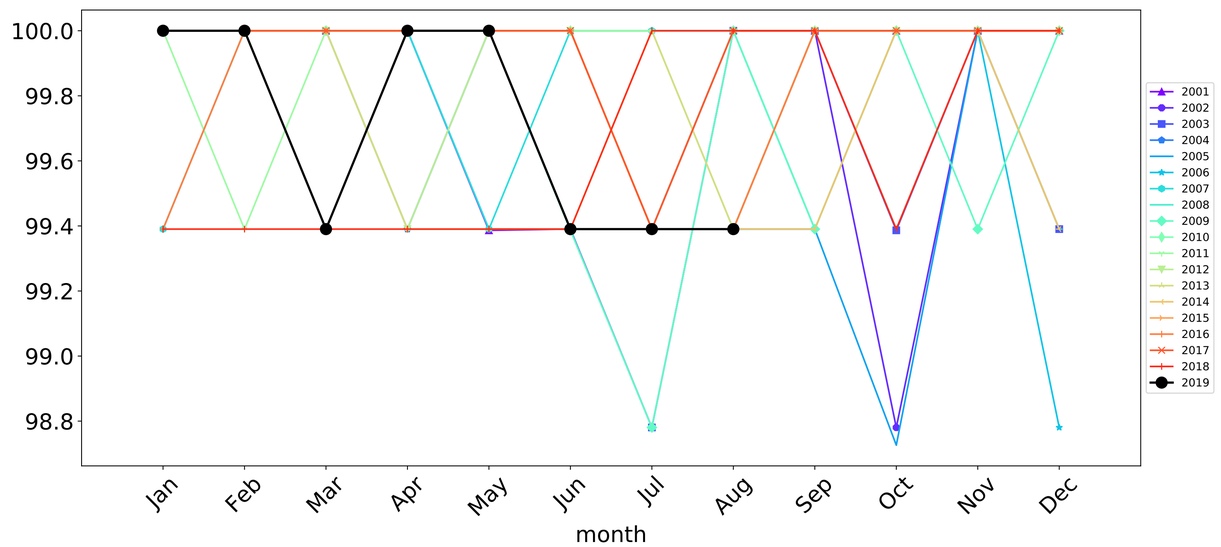
Wind erosion historical monthly area protected (Total Veg Cov >50%)

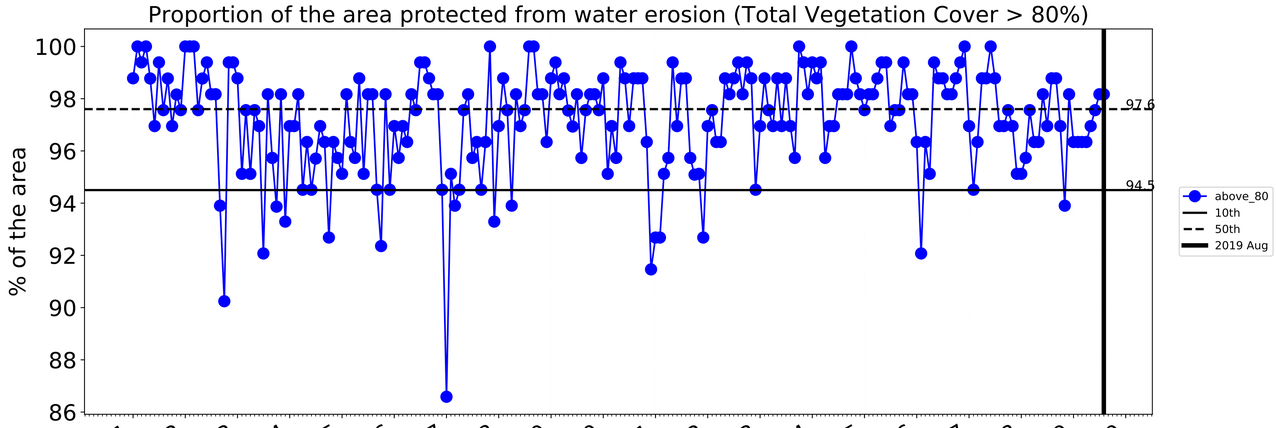


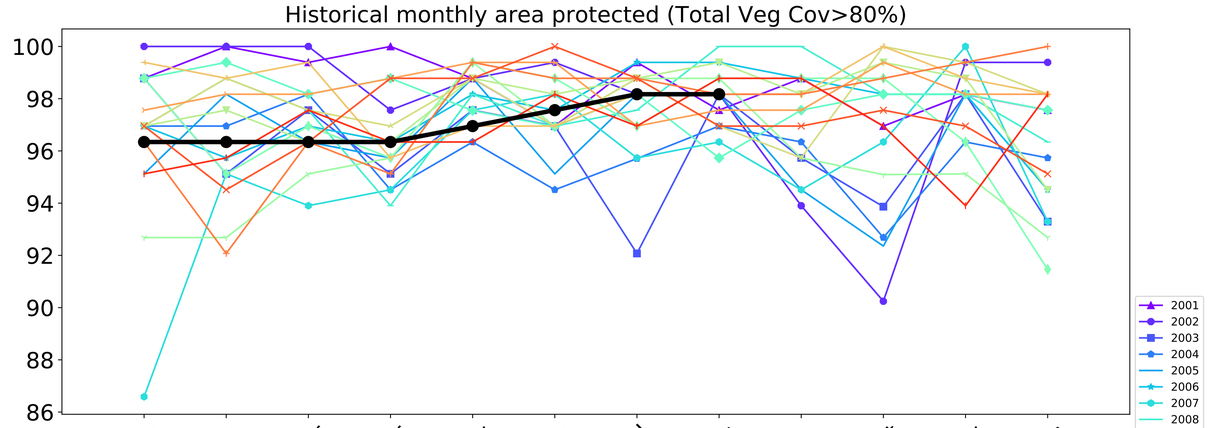
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
97.6
94.5
above_80
10th
50th
2019 Aug


Historical monthly area protected (Total Veg Cov>80%)
Jan
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2004
2005
2006
2007
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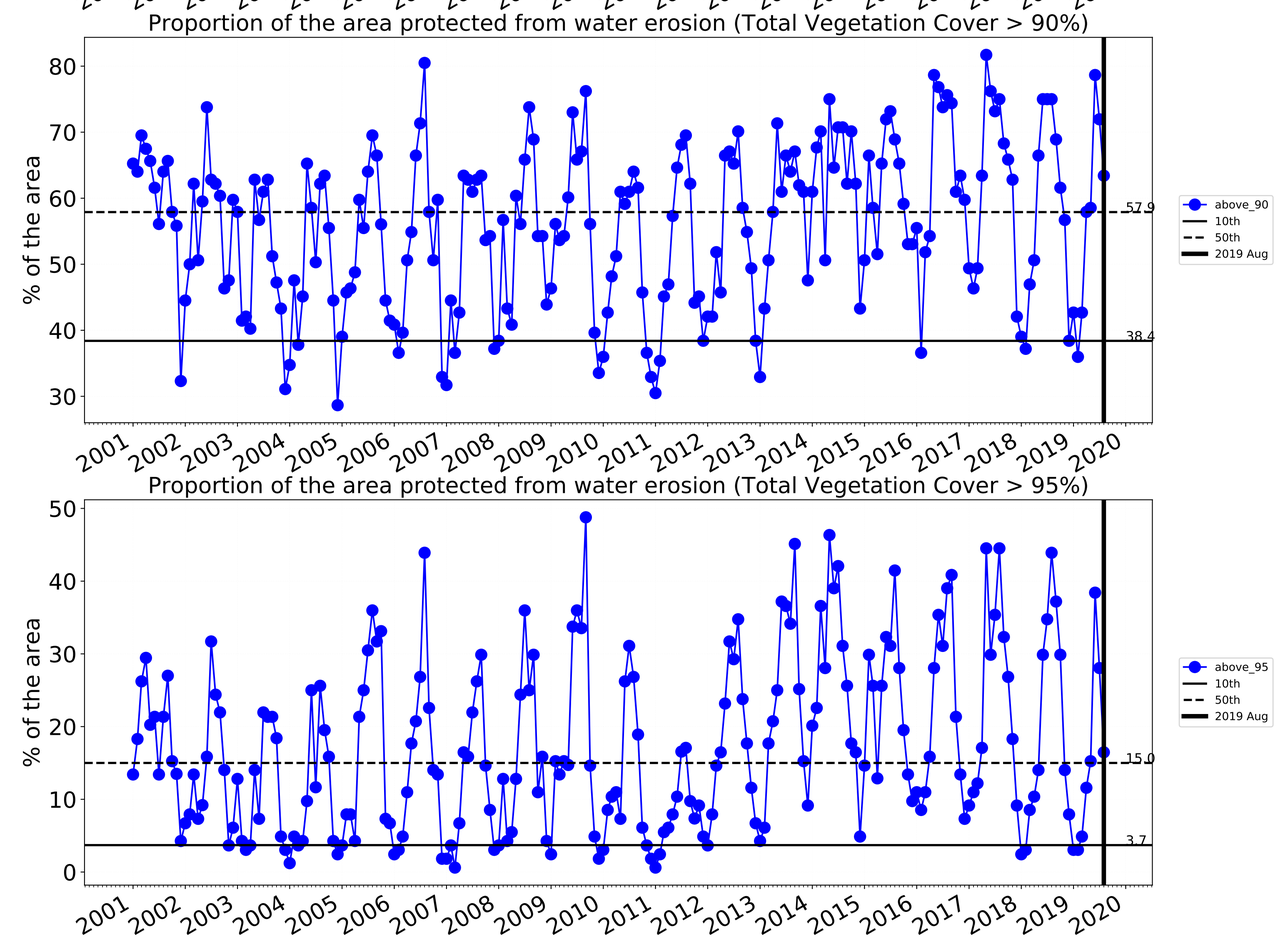
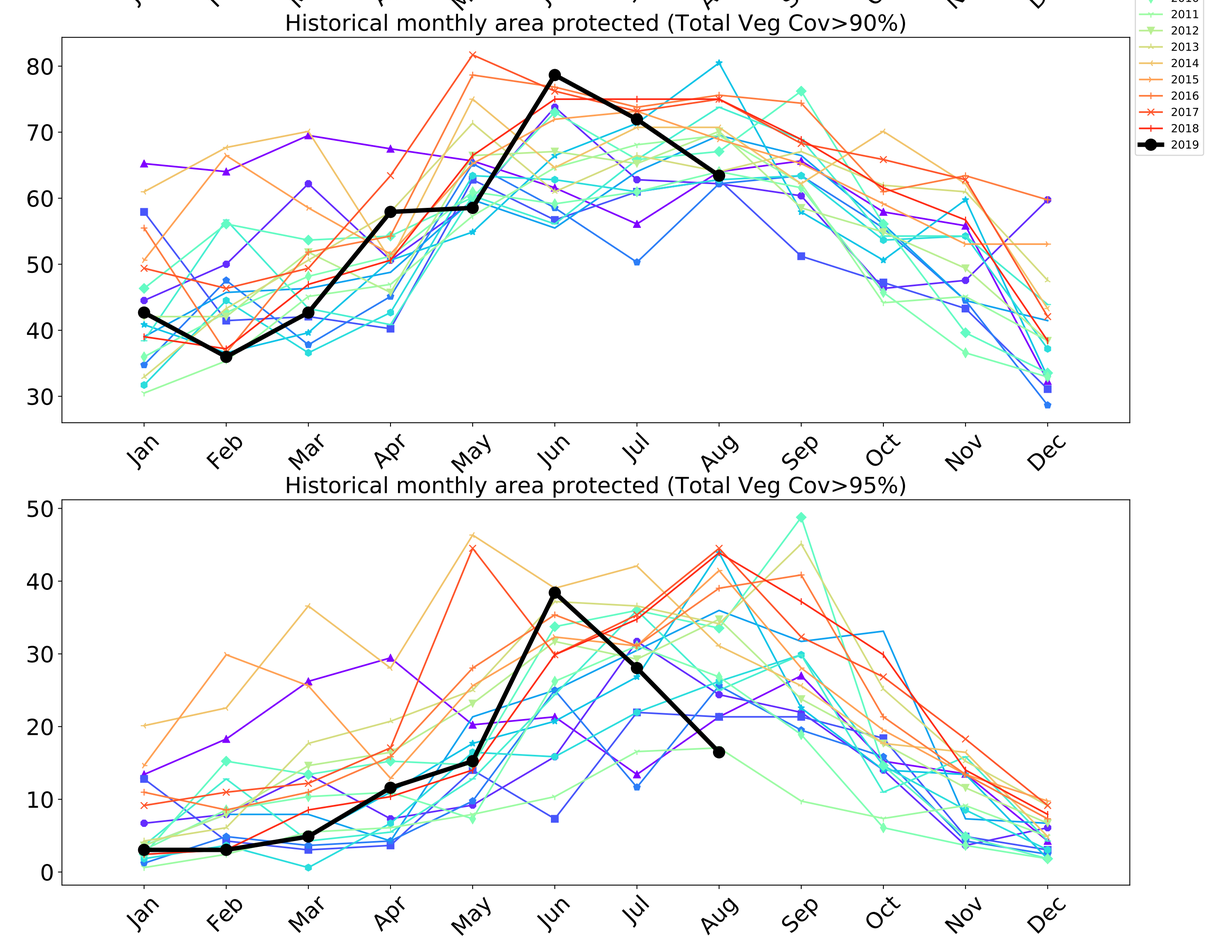
2019


Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
57.9
38.4
above_90
10th
50th
2019 Aug
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
15.0
3.7
above_95
10th
50th
2019 Aug


Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
Jan
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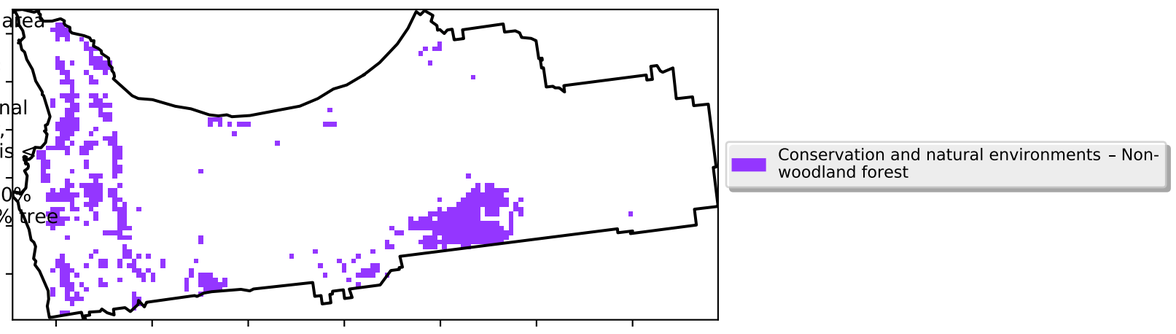
2019

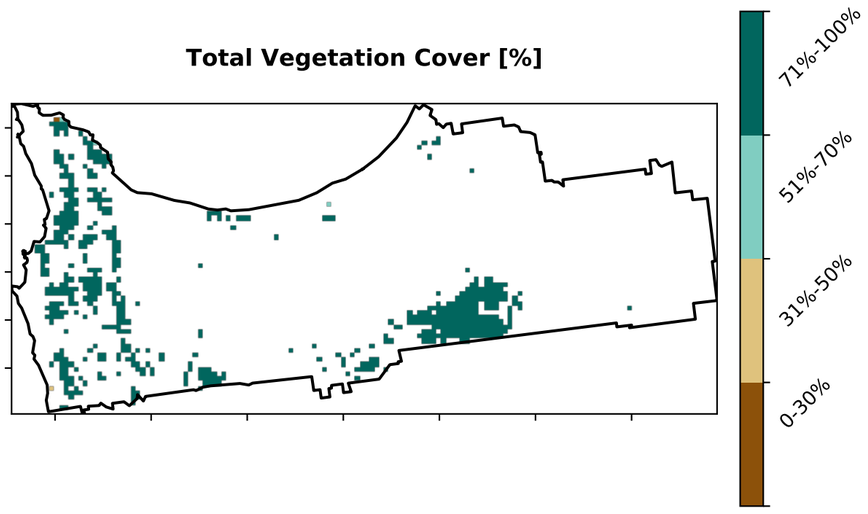
Conservation and natural environments Forest (non woodland)

Land use and forest cover

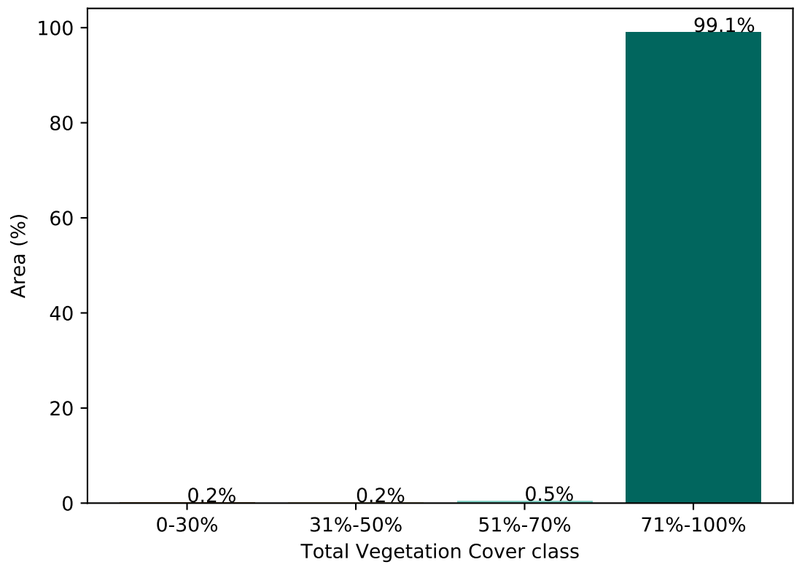
Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is <20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.



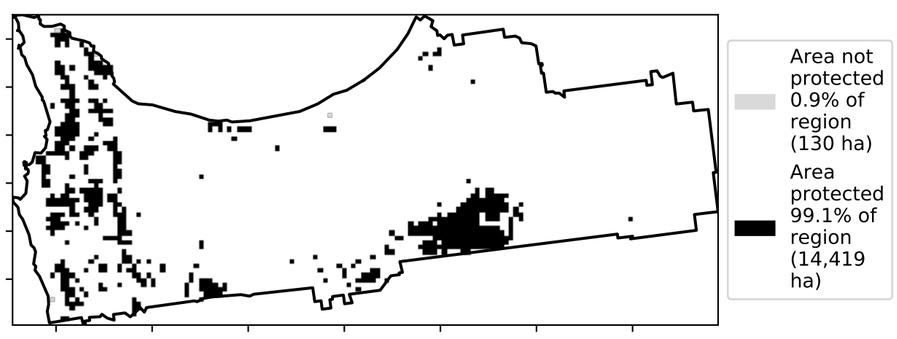
Total Vegetation Cover [%]



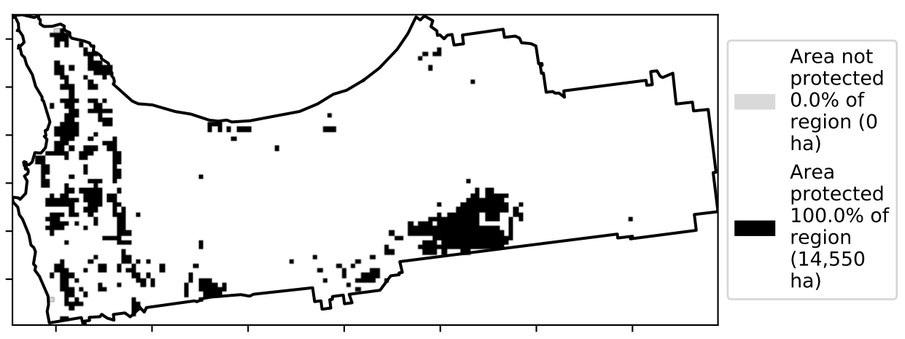
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)

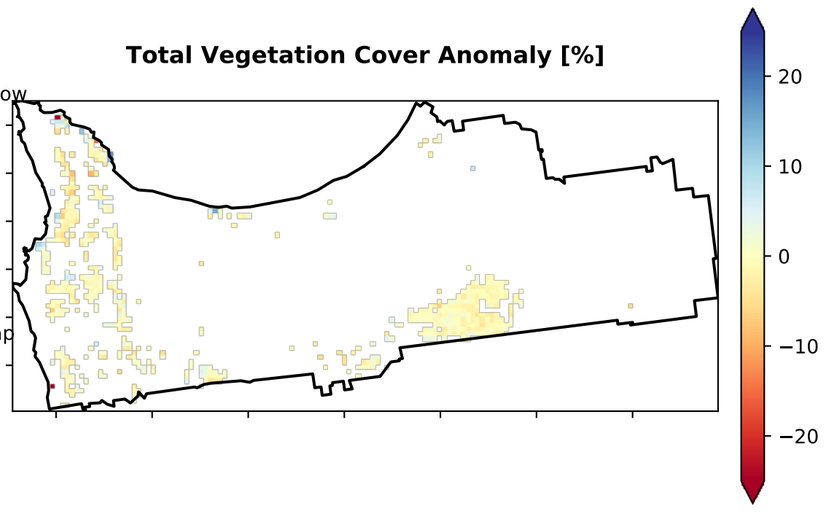


% Area protected from wind erosion (>50%)



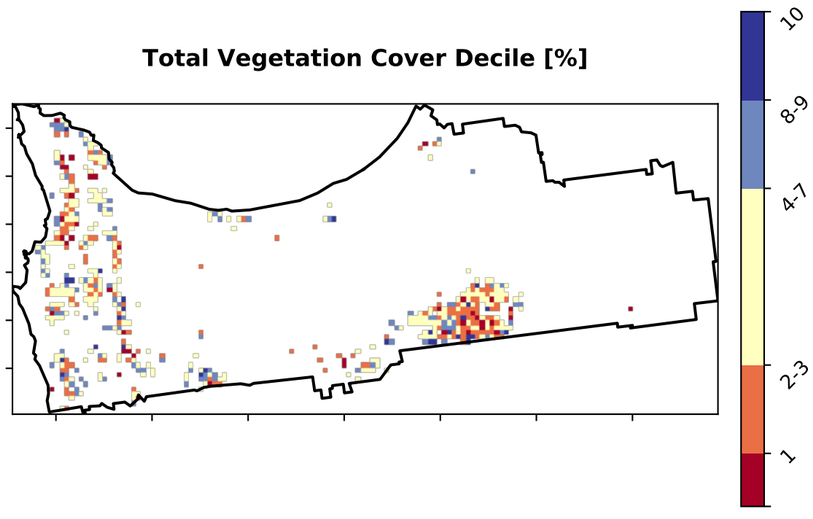
Total Vegetation Cover Anomaly [%]

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



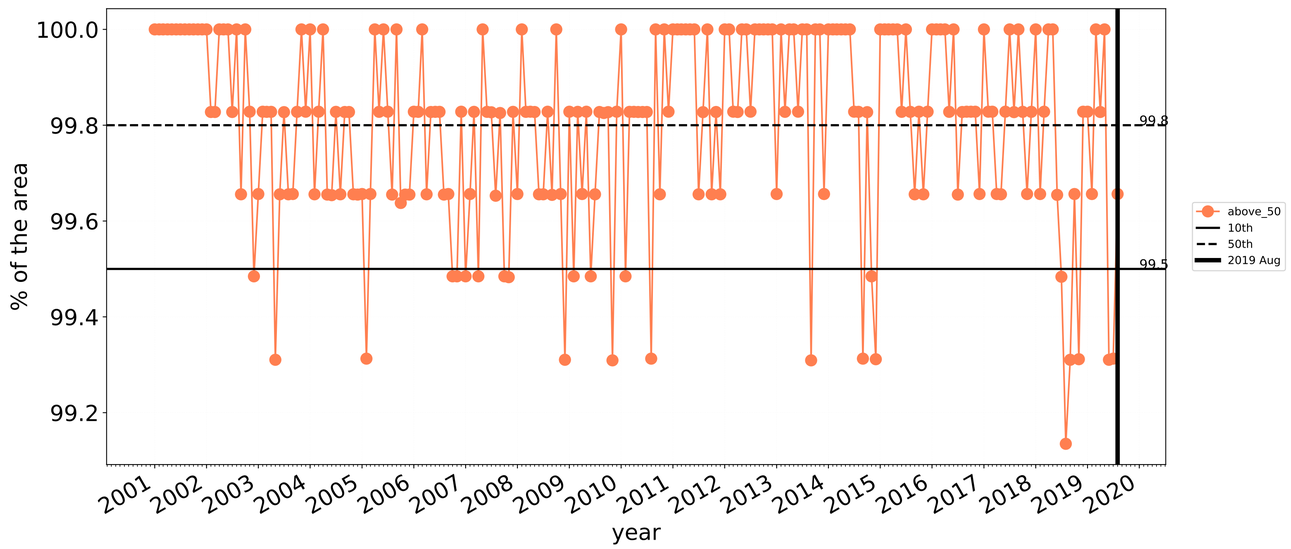
Total Vegetation Cover Decile [%]

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

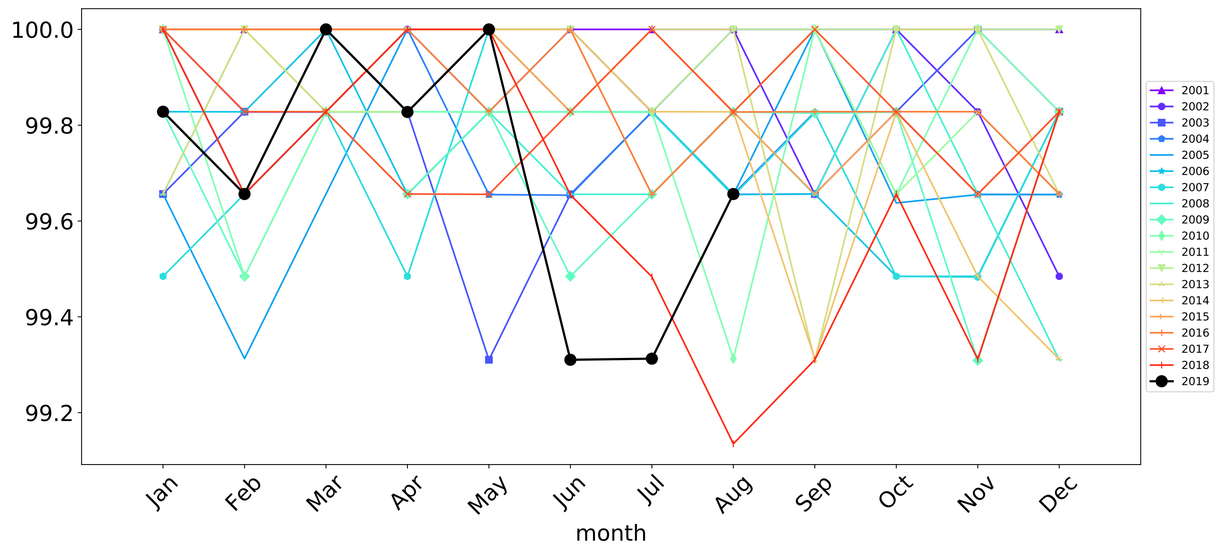


Conservation and natural environments Forest (non woodland) timeseries

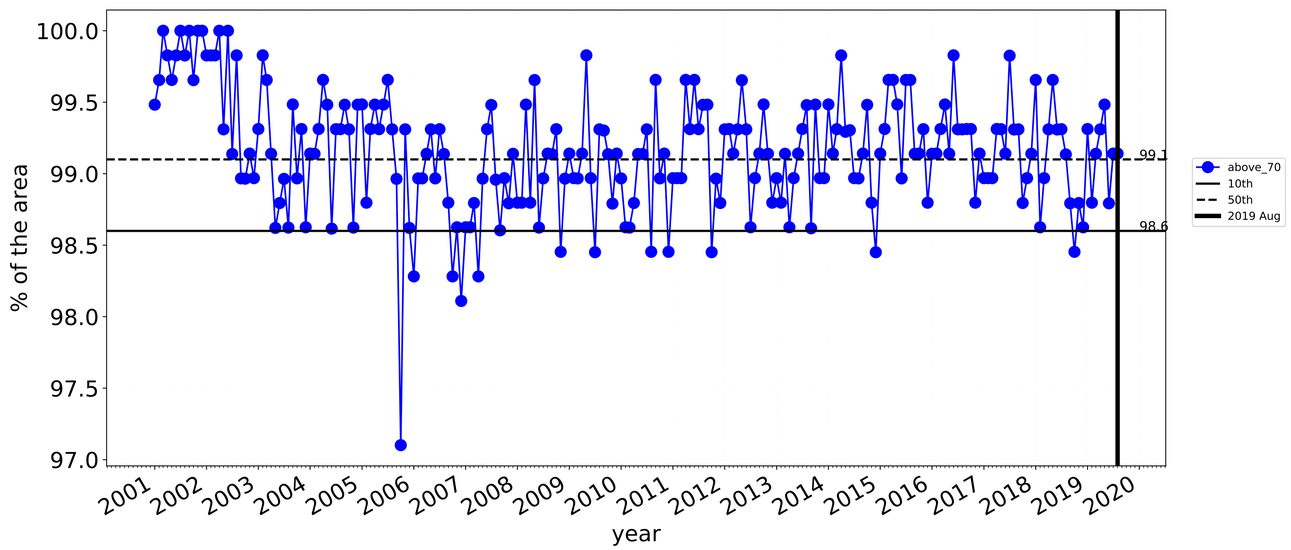
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



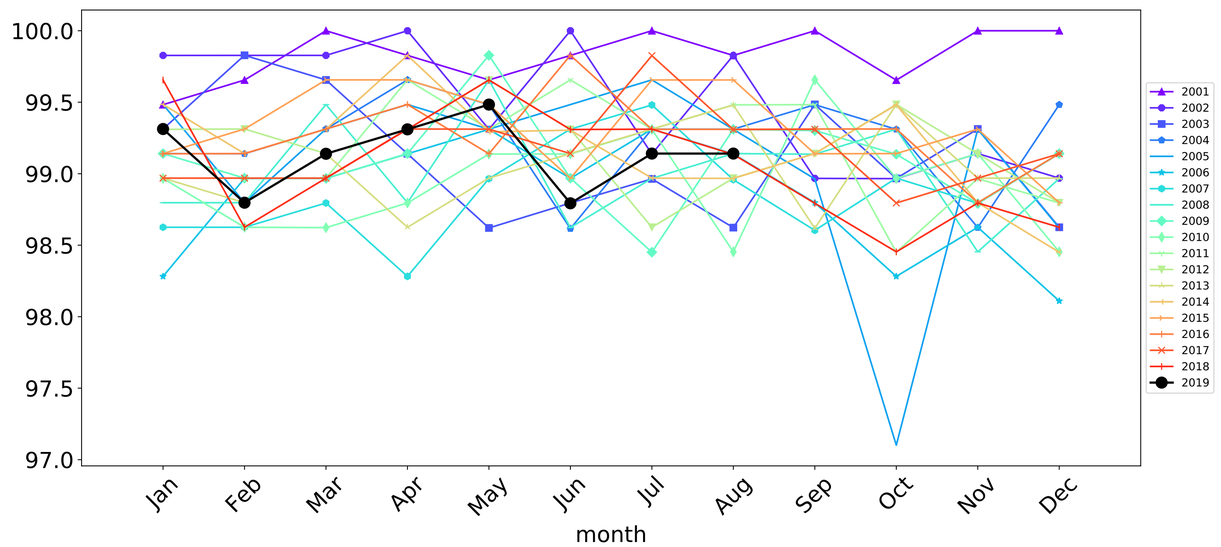
Wind erosion historical monthly area protected (Total Veg Cov >50%)

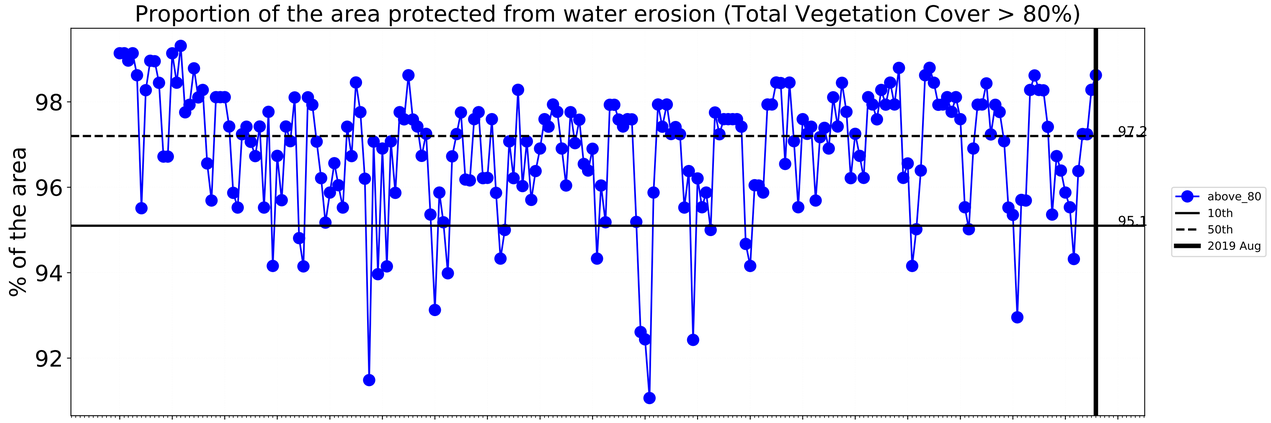


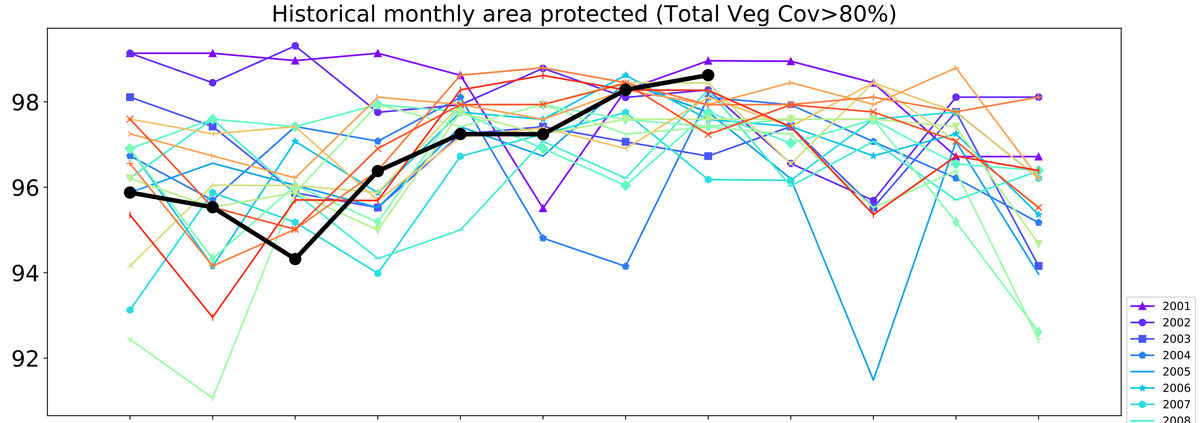
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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




Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
97.2
95.1
above_80
10th
50th
2019 Aug


Historical monthly area protected (Total Veg Cov>80%)
Jan
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2004
2005
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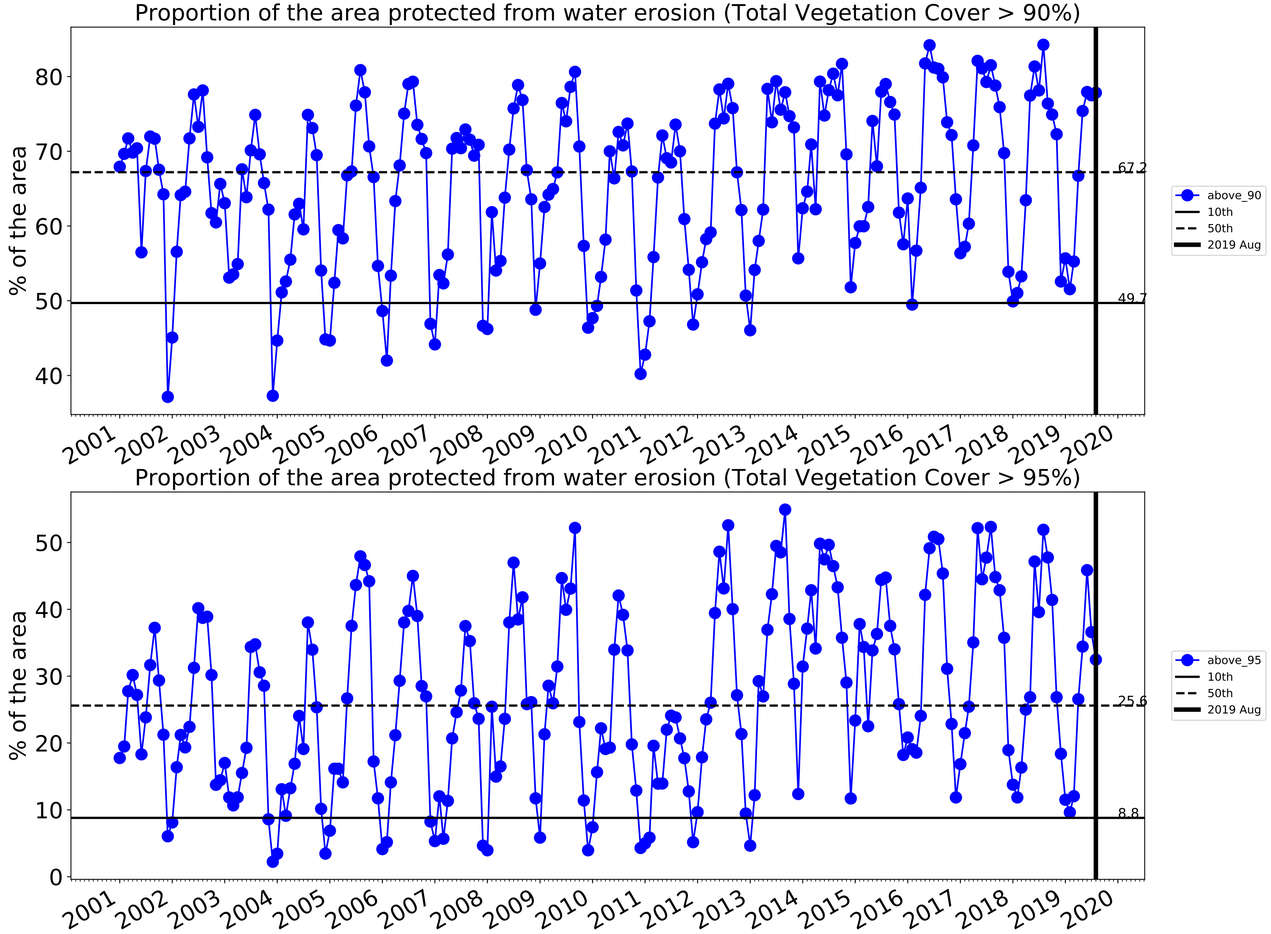
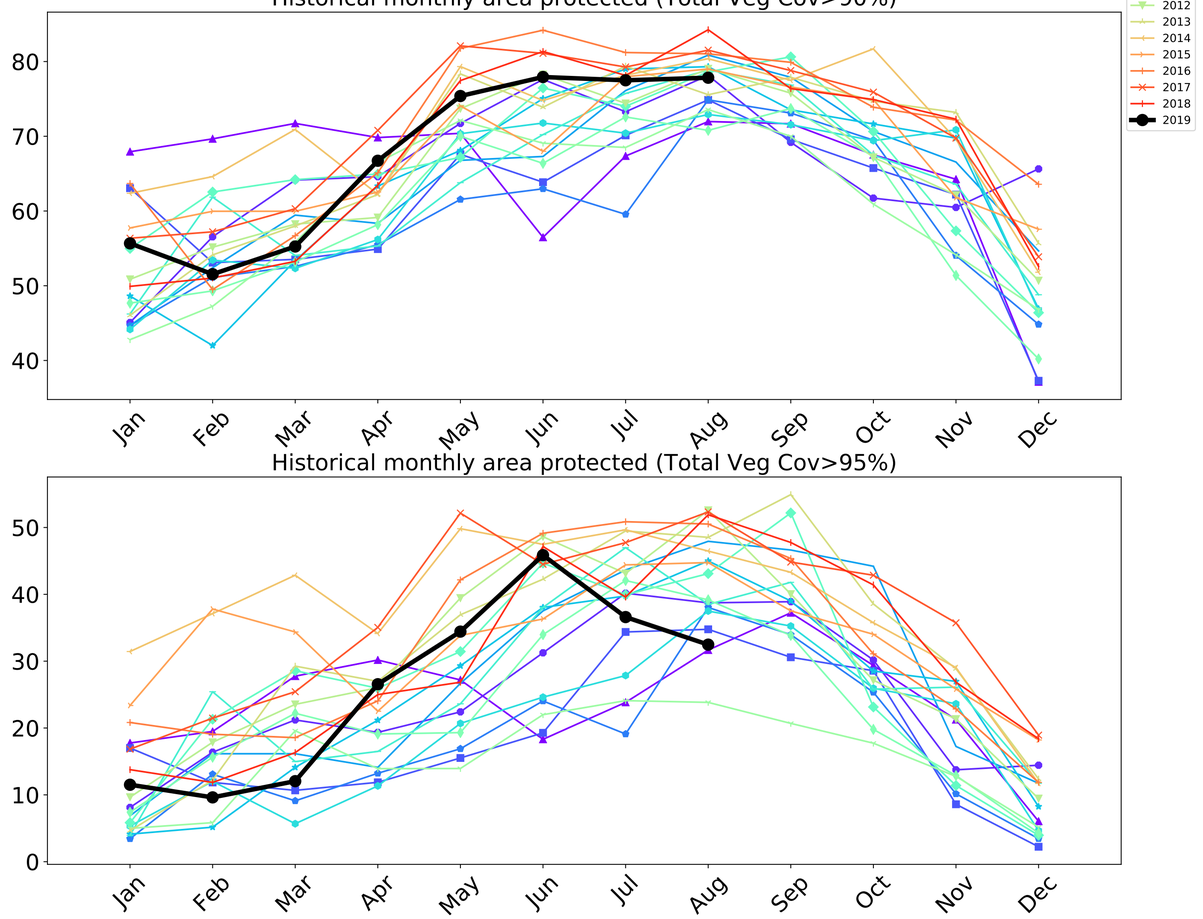
2019


Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
67.2
49.7
above_90
10th
50th
2019 Aug
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
25.6
8.8
above_95
10th
50th
2019 Aug


Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
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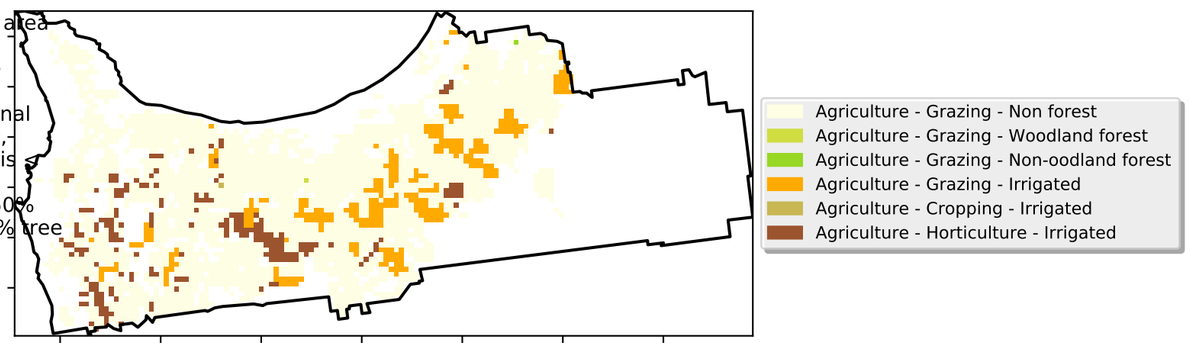
2016
2017
2018
2019

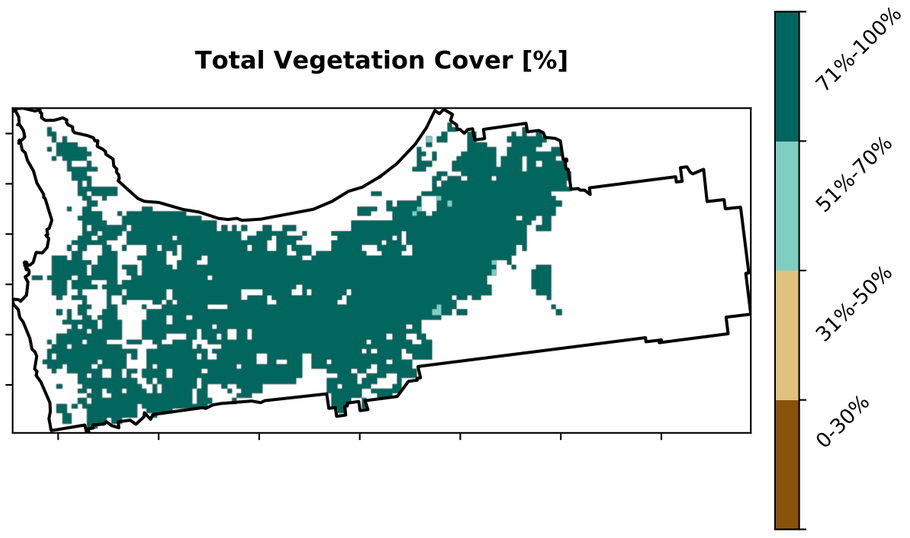
Agriculture

Land use and forest cover

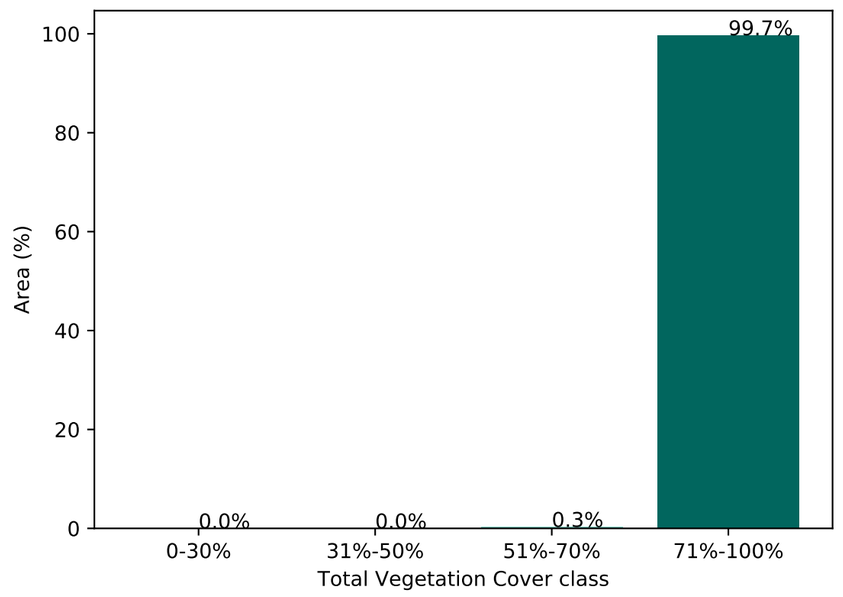
Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.



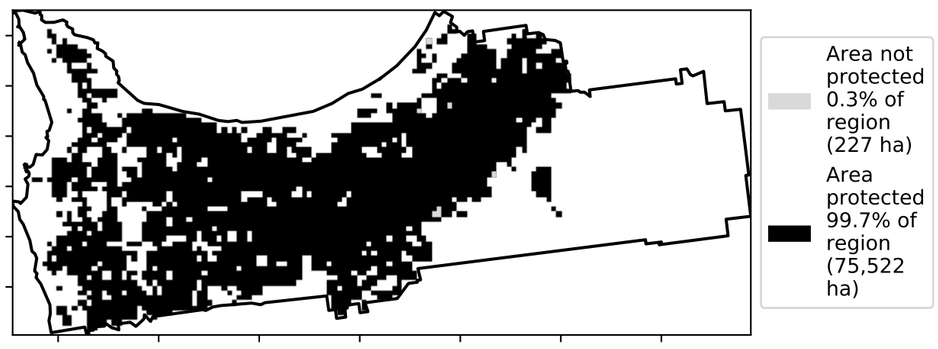
Total Vegetation Cover [%]



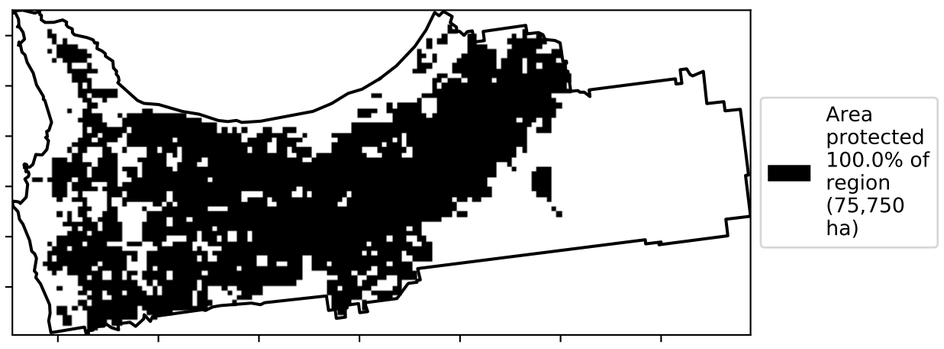
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)

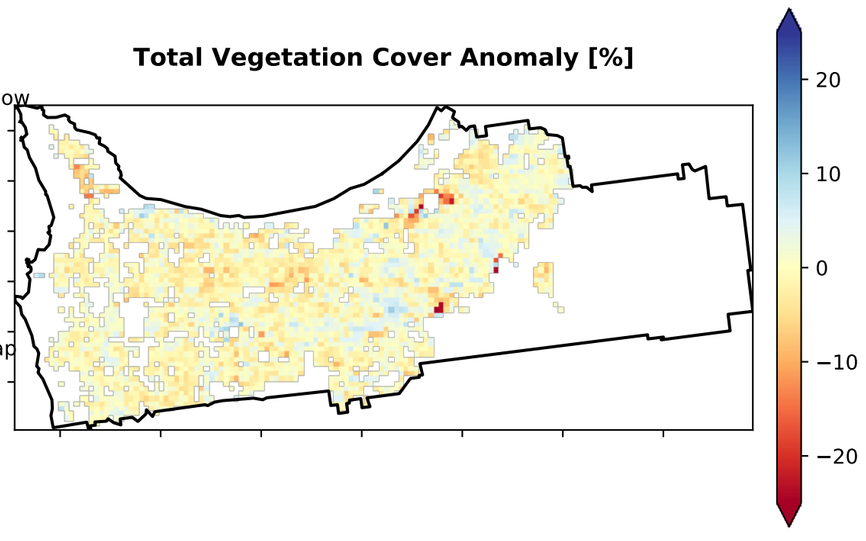


% Area protected from wind erosion (>50%)



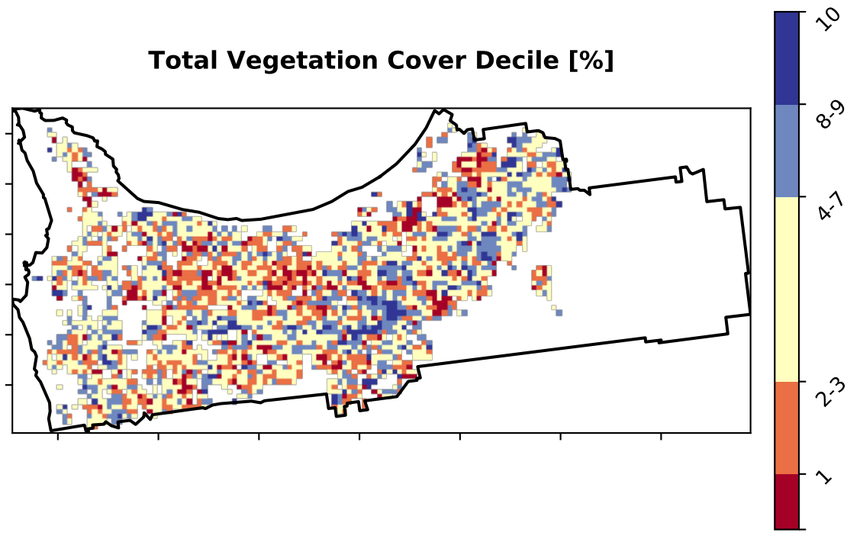
Total Vegetation Cover Anomaly [%]

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



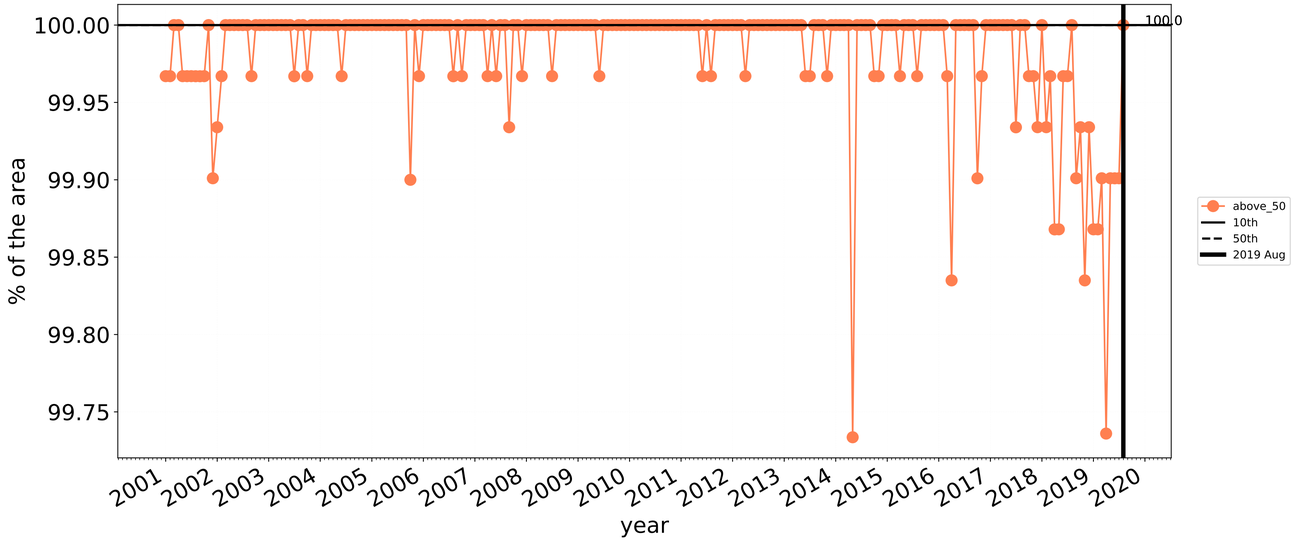
Total Vegetation Cover Decile [%]

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

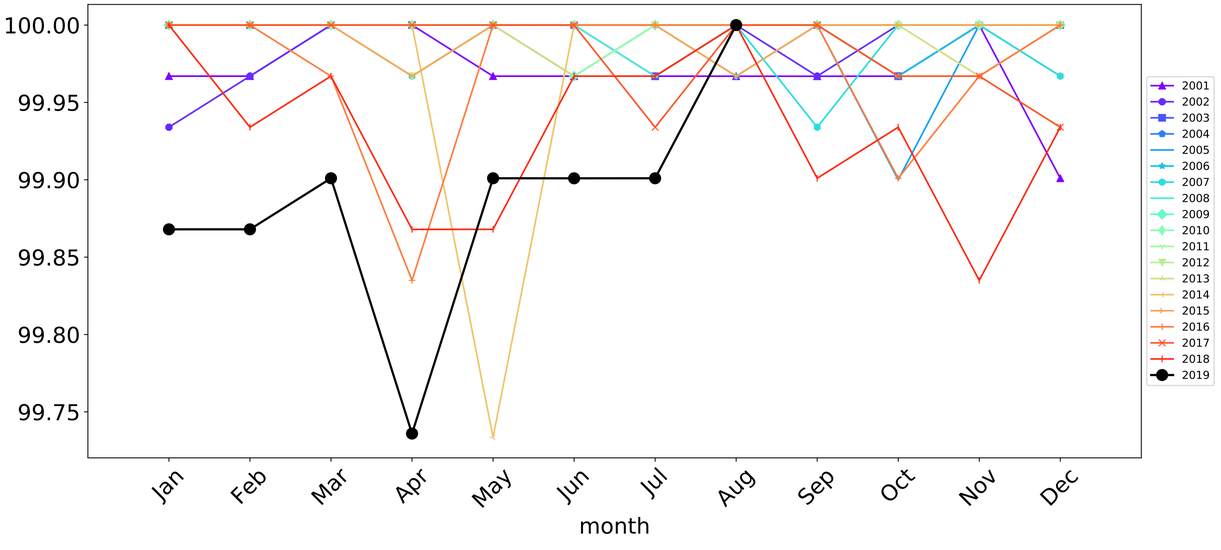


Agriculture timeseries

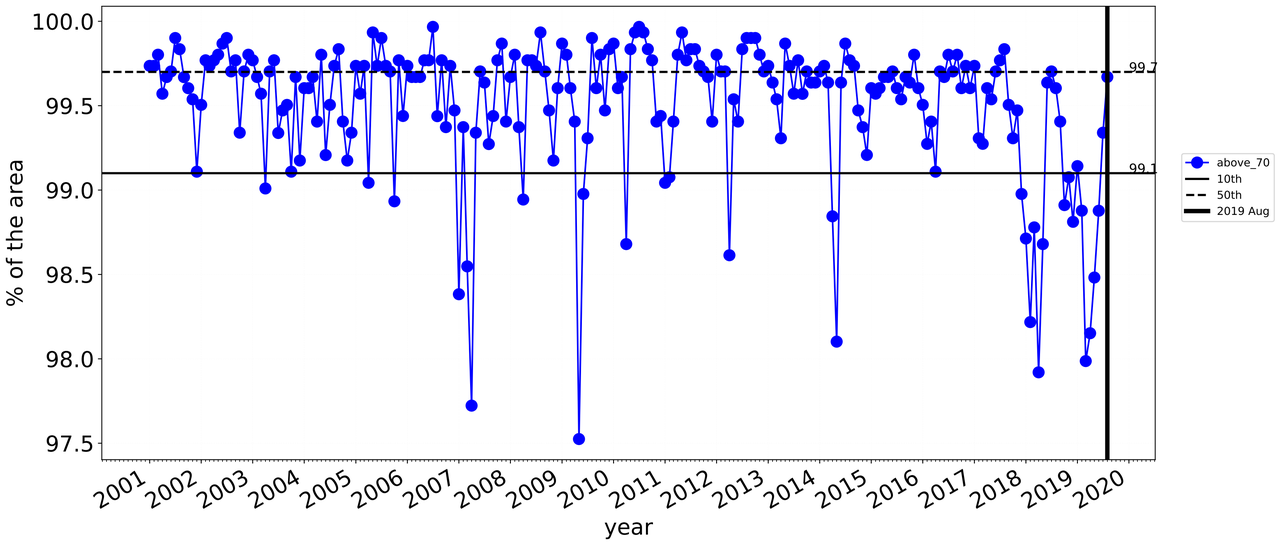
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



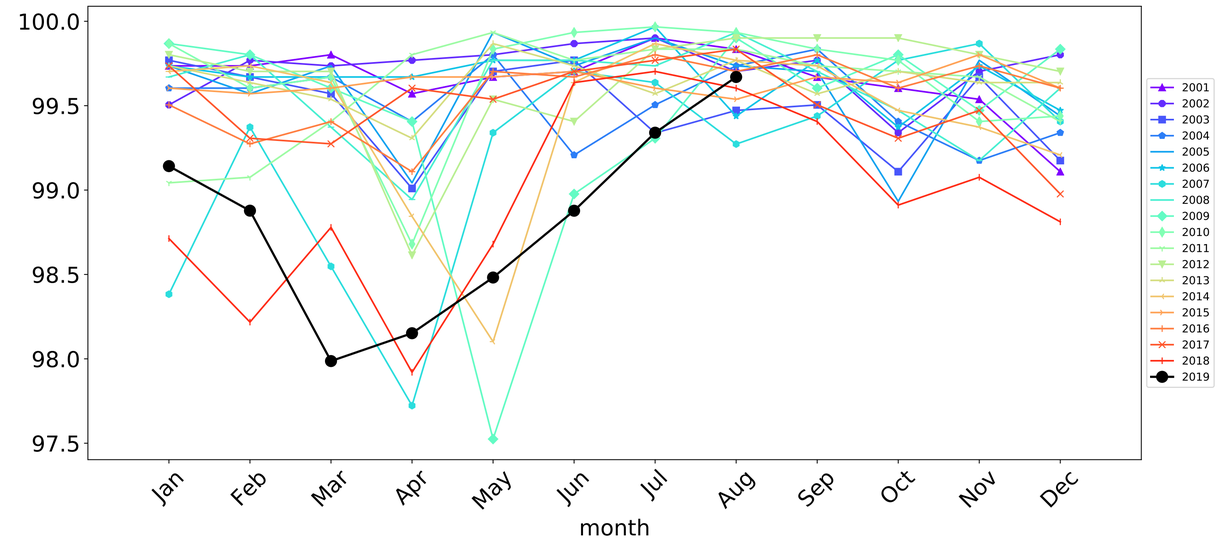
Wind erosion historical monthly area protected (Total Veg Cov >50%)



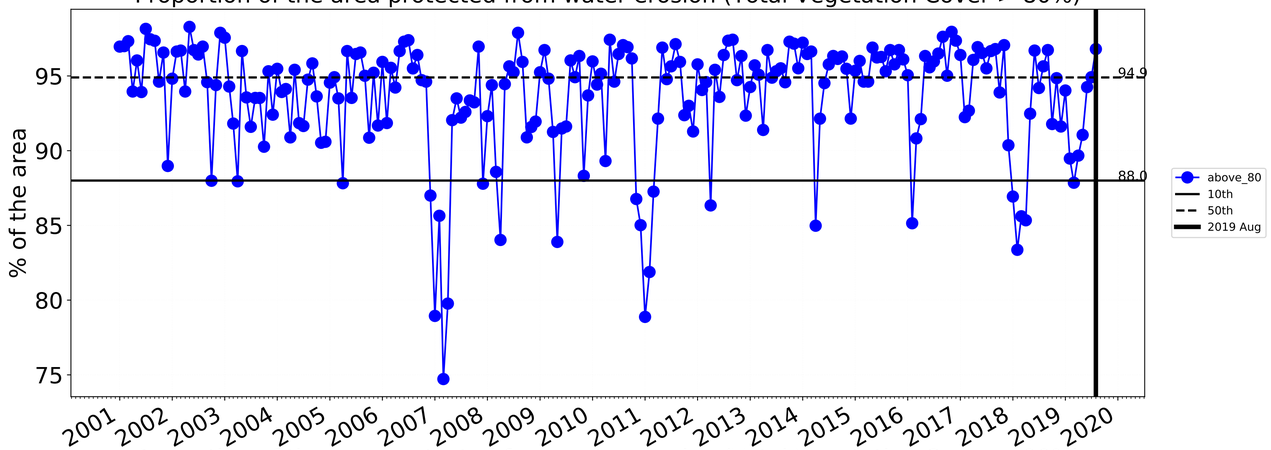
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



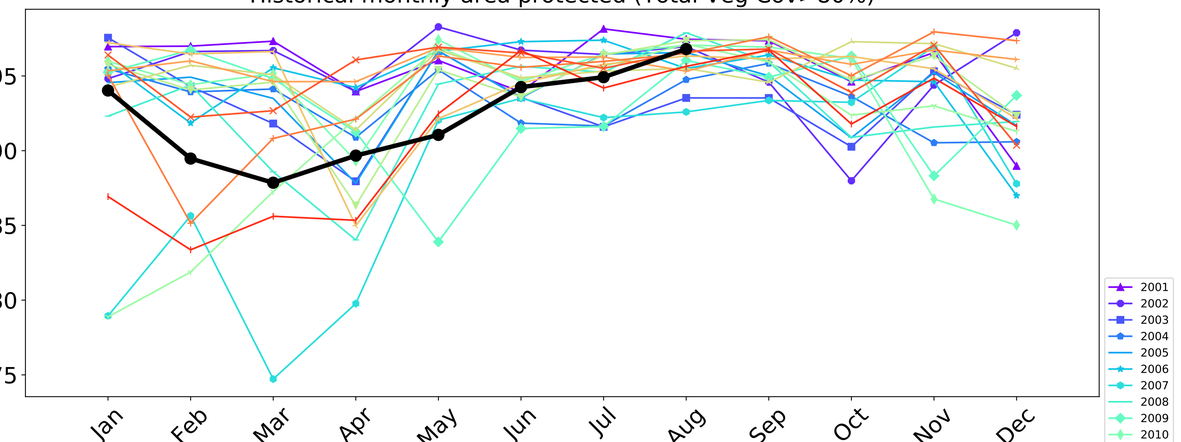
Water erosion historical monthly area protected (Total Veg Cov>70%)



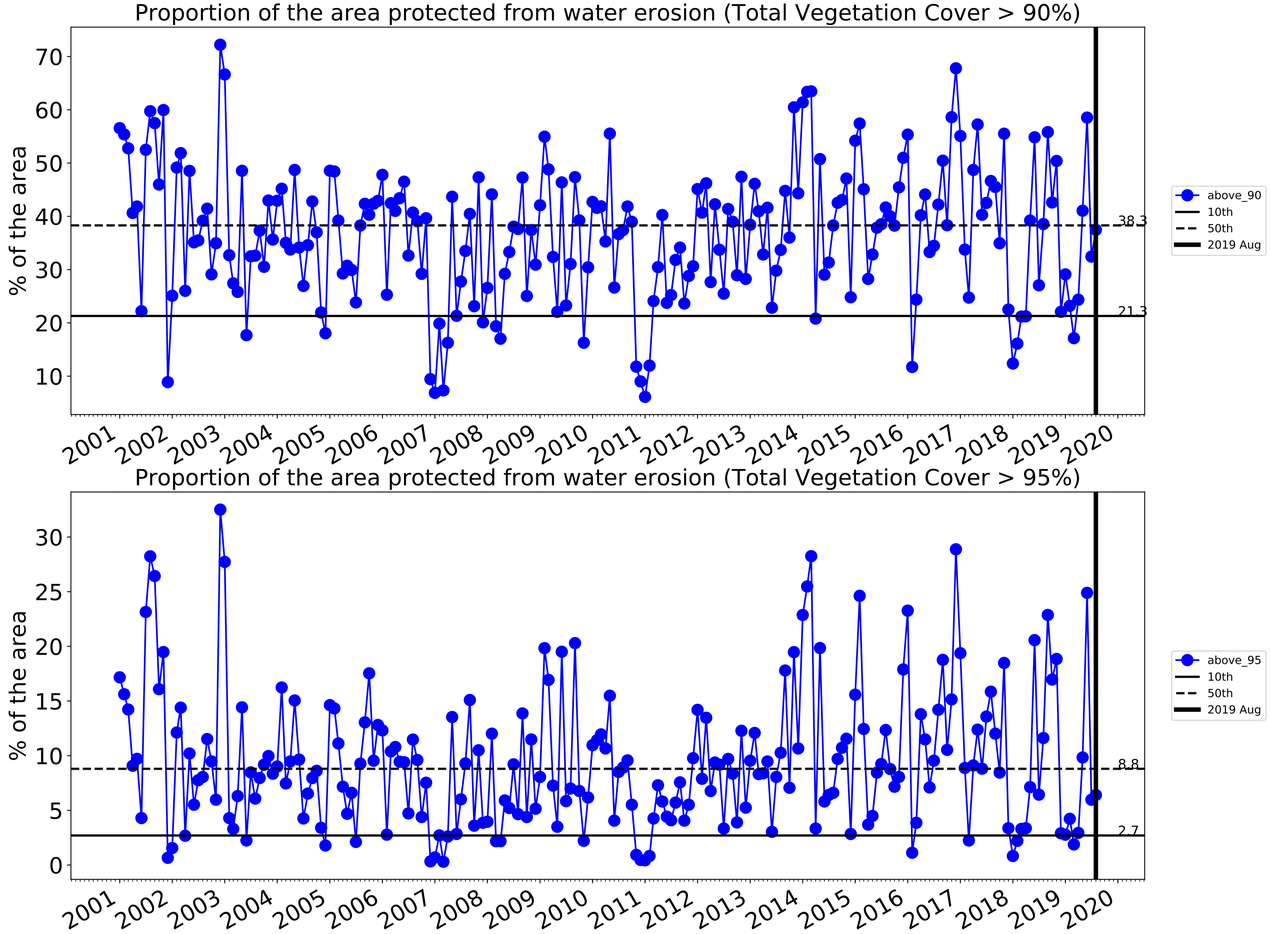
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



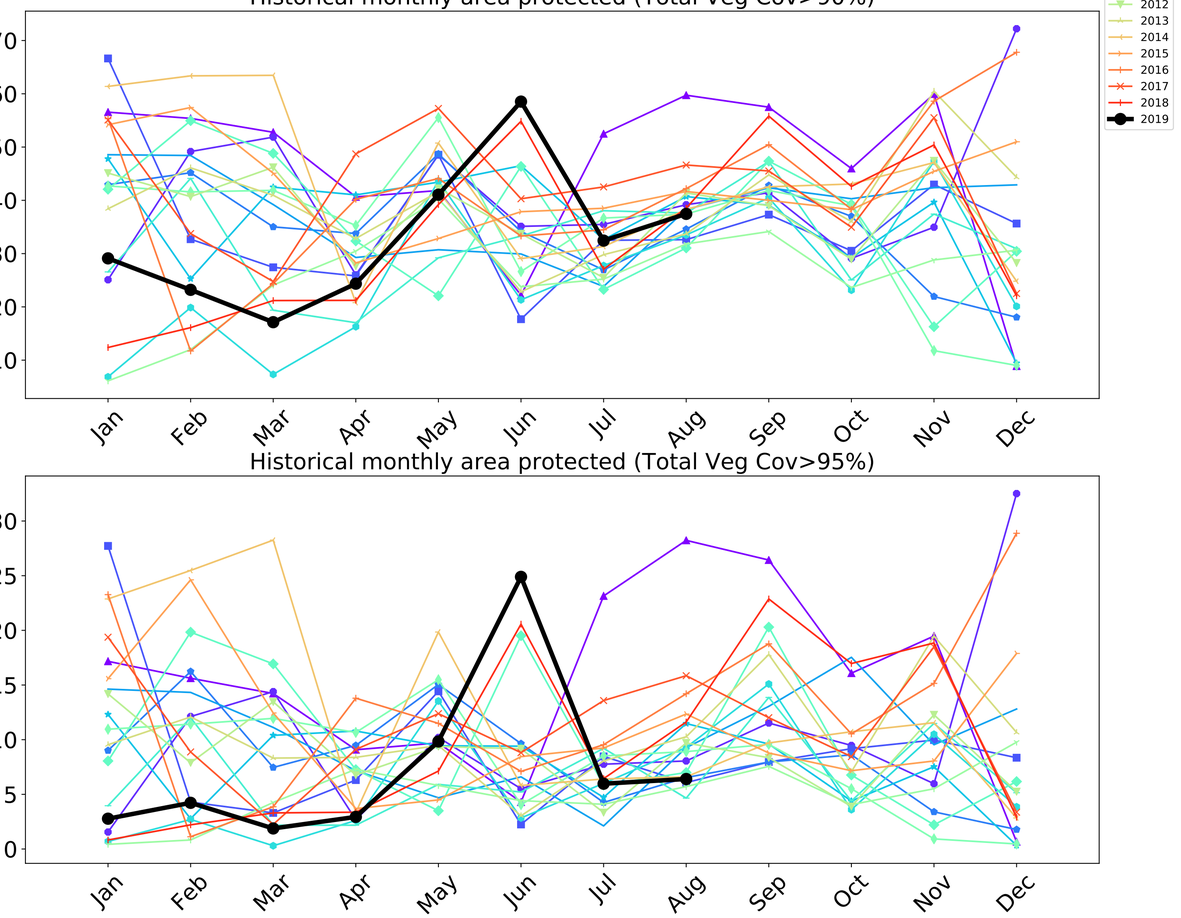
Historical monthly area protected (Total Veg Cov>80%)



Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)



Historical monthly area protected (Total Veg Cov>90%)



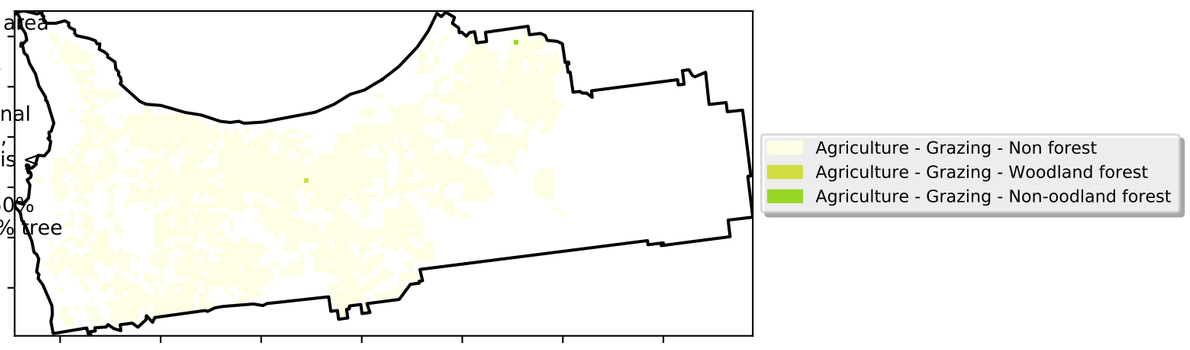
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)

Historical monthly area protected (Total Veg Cov>95%)

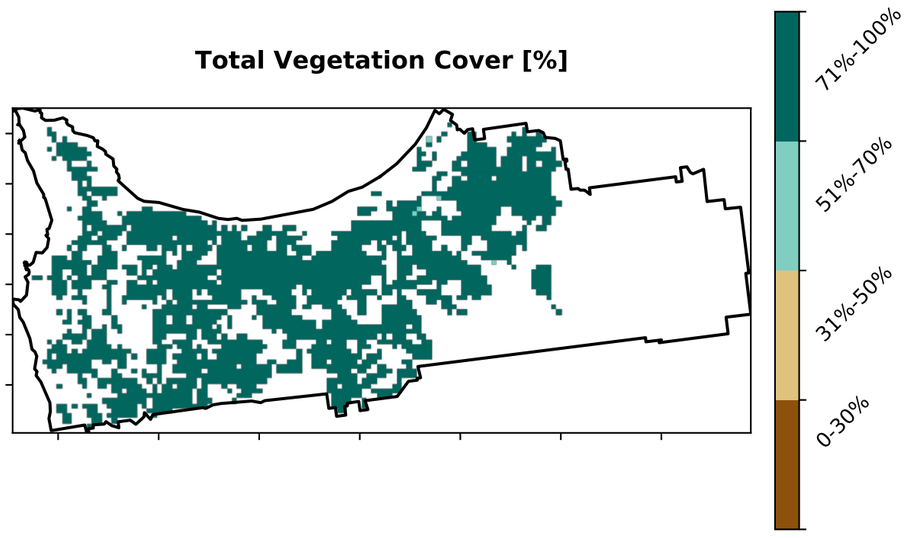
Grazing

Land use and forest cover

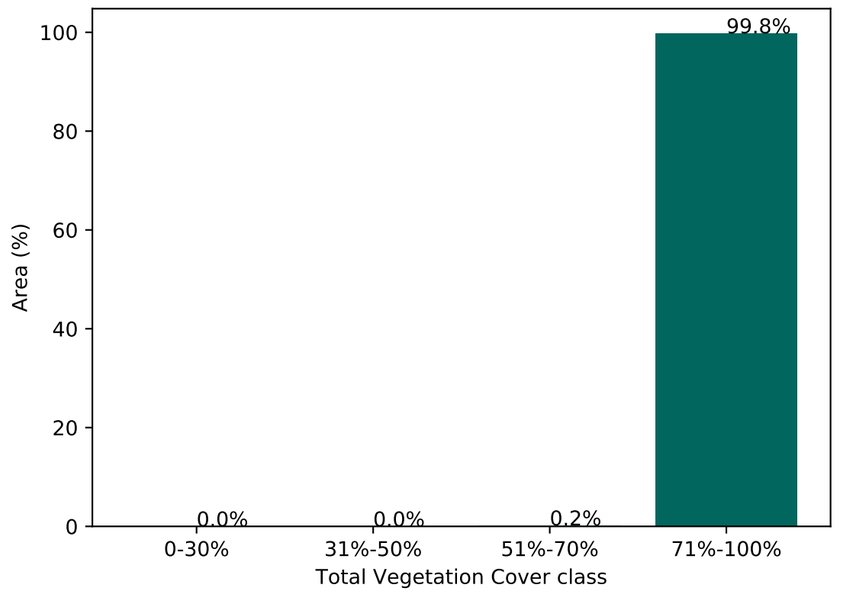
Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.



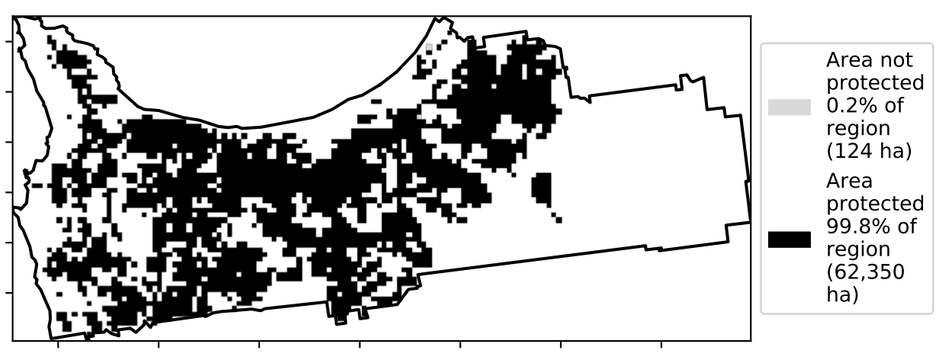
Total Vegetation Cover [%]



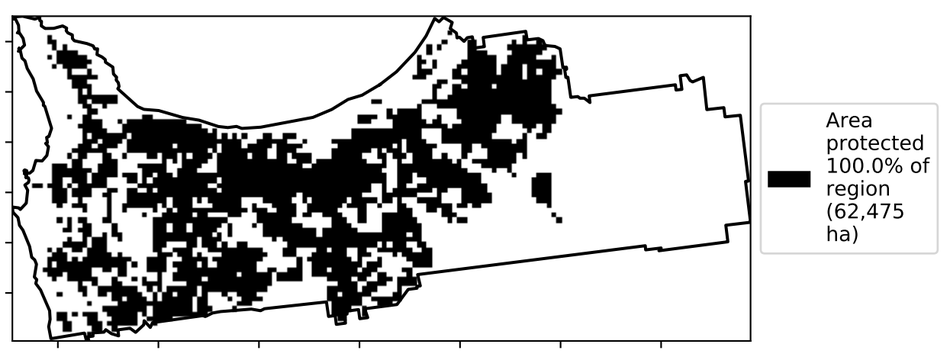
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)

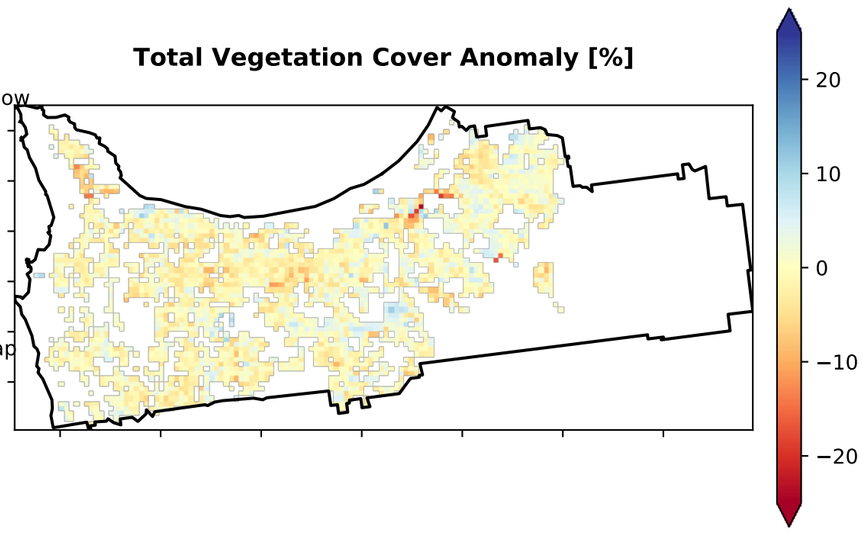


% Area protected from wind erosion (>50%)



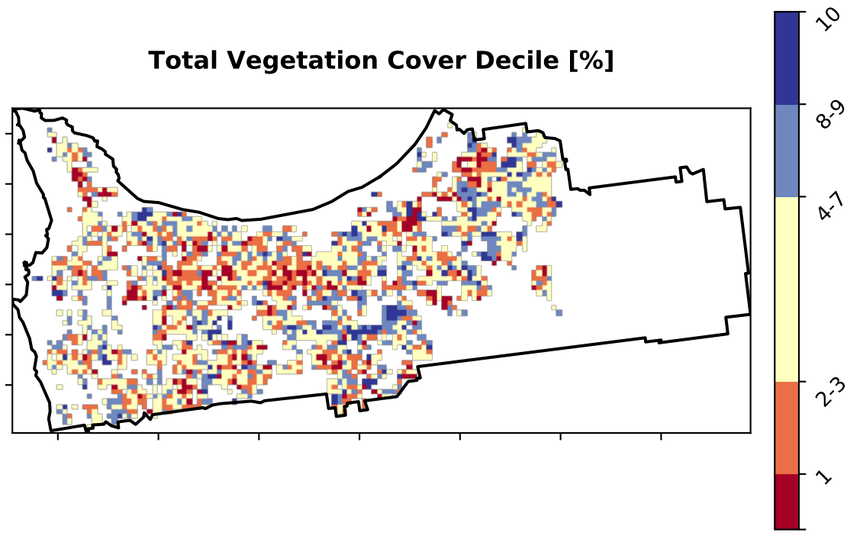
Total Vegetation Cover Anomaly [%]

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



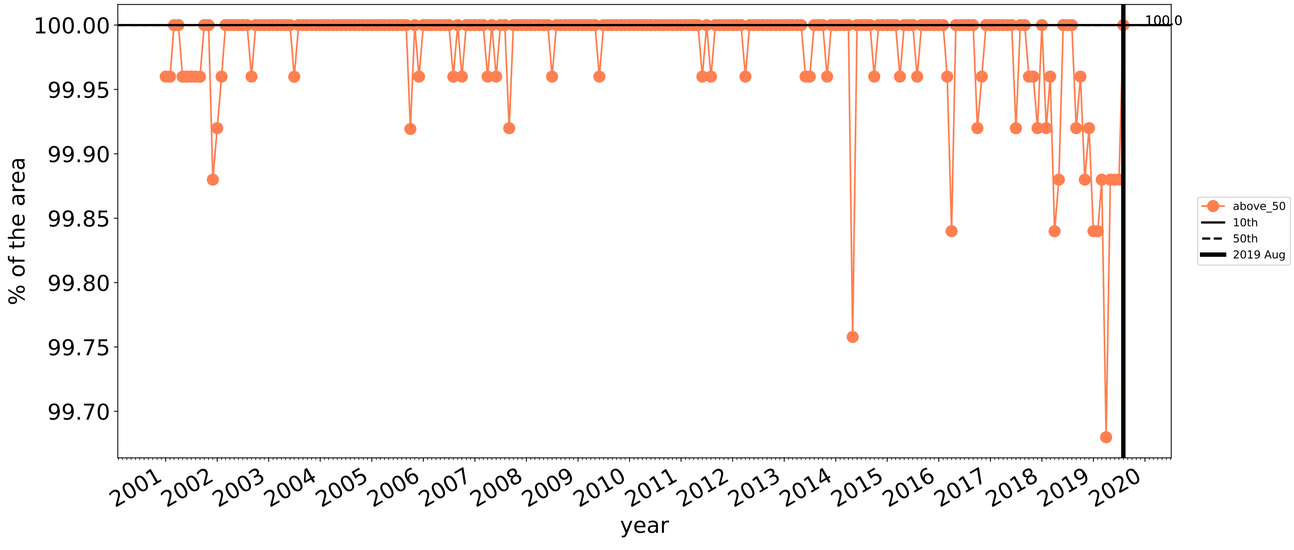
Total Vegetation Cover Decile [%]

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

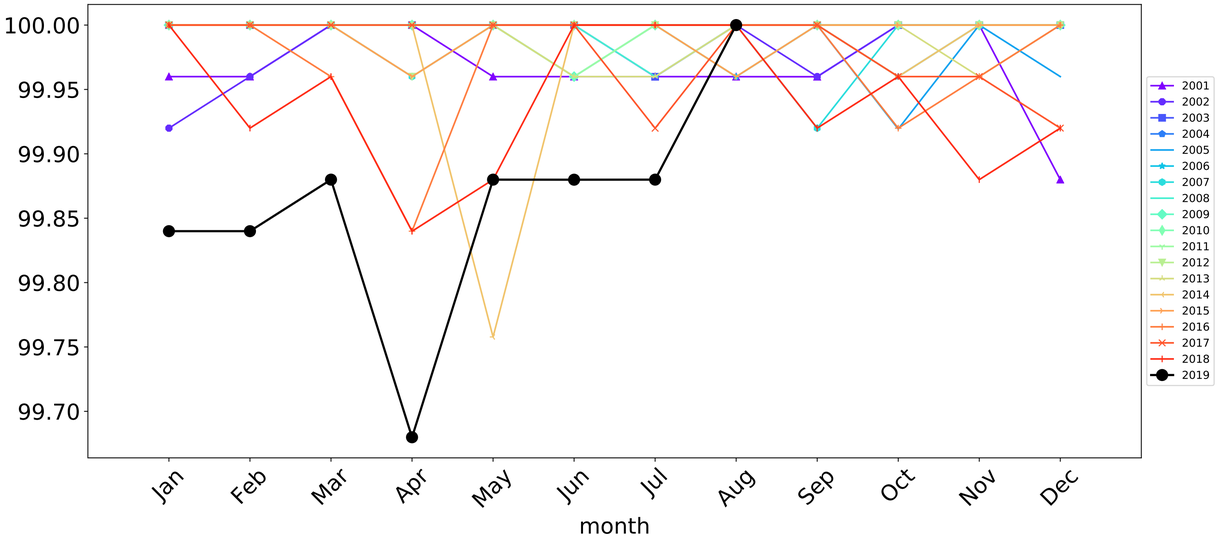


Grazing timeseries

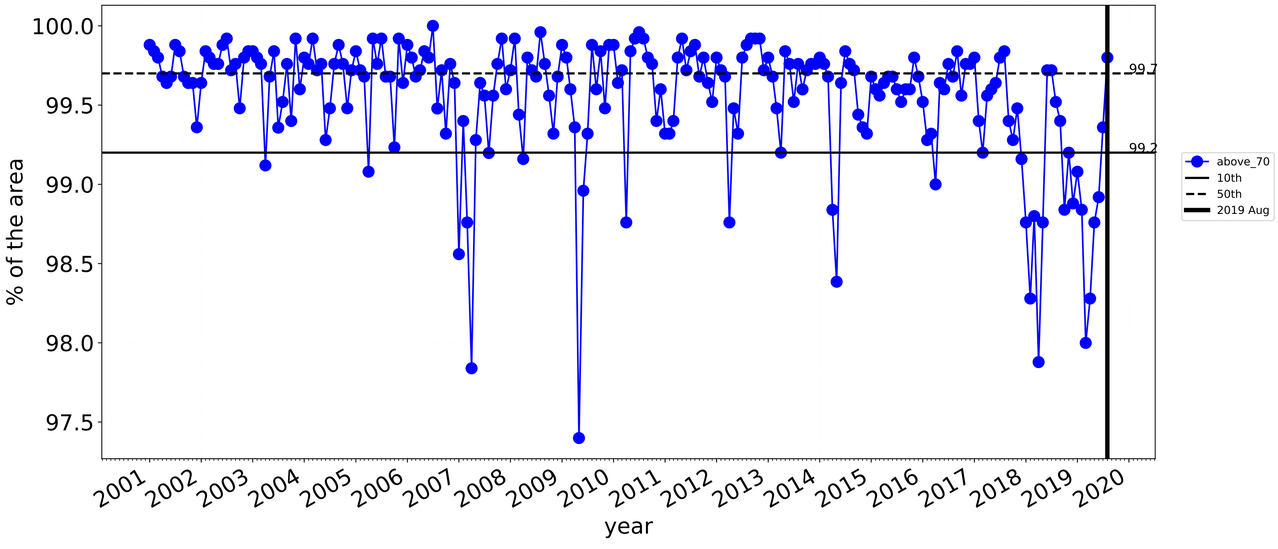
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



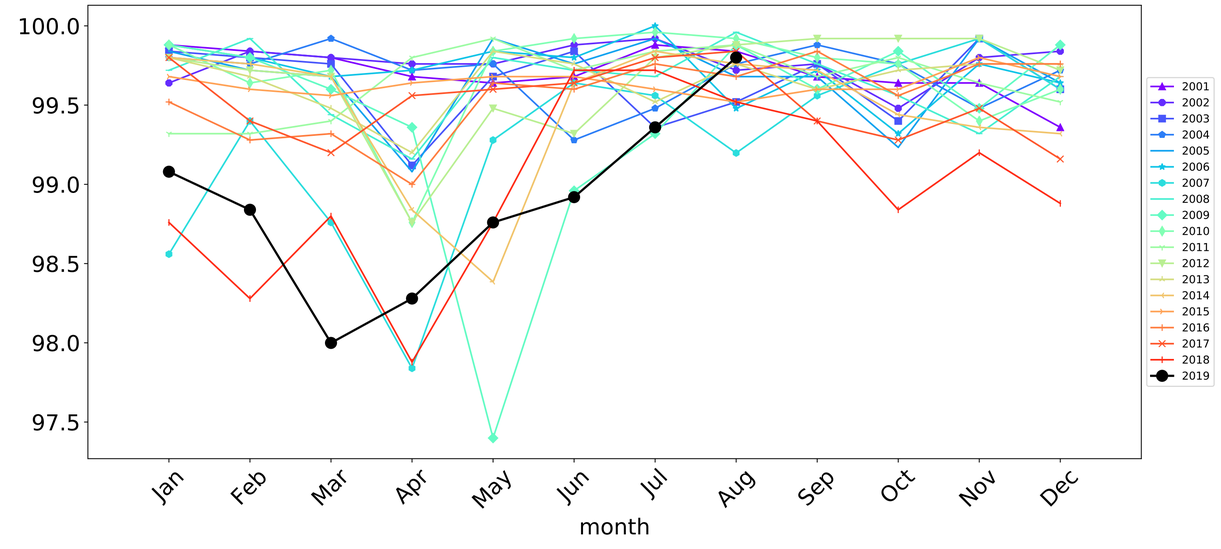
Wind erosion historical monthly area protected (Total Veg Cov >50%)



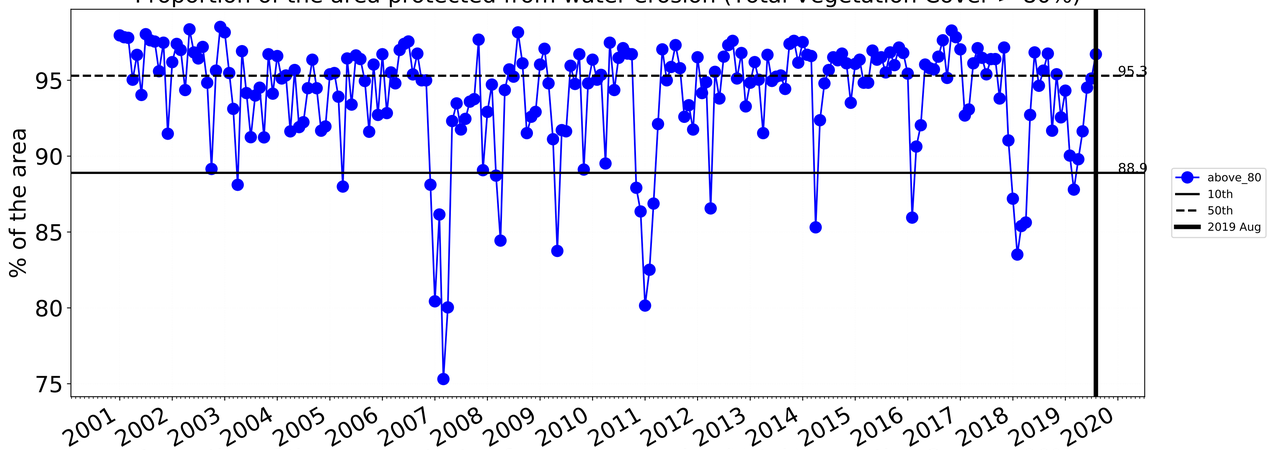
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



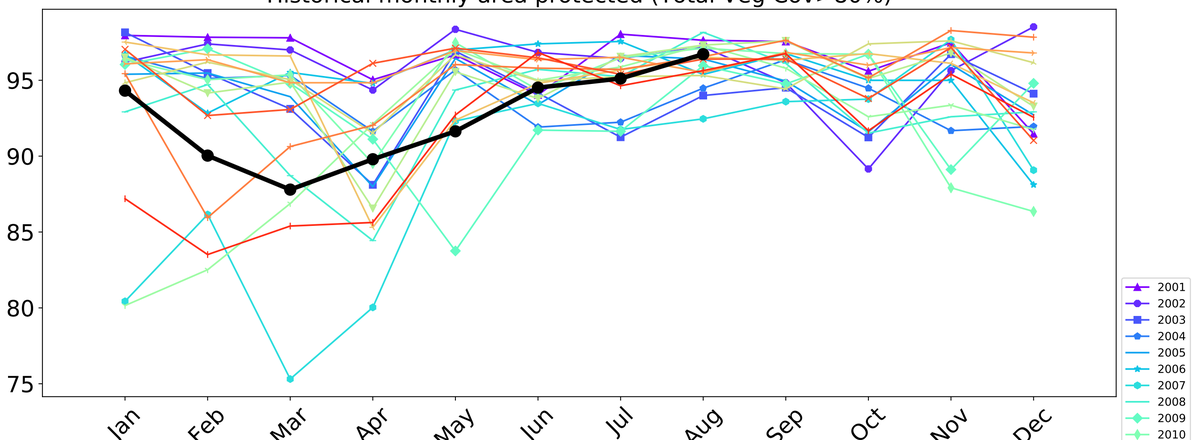
Water erosion historical monthly area protected (Total Veg Cov>70%)



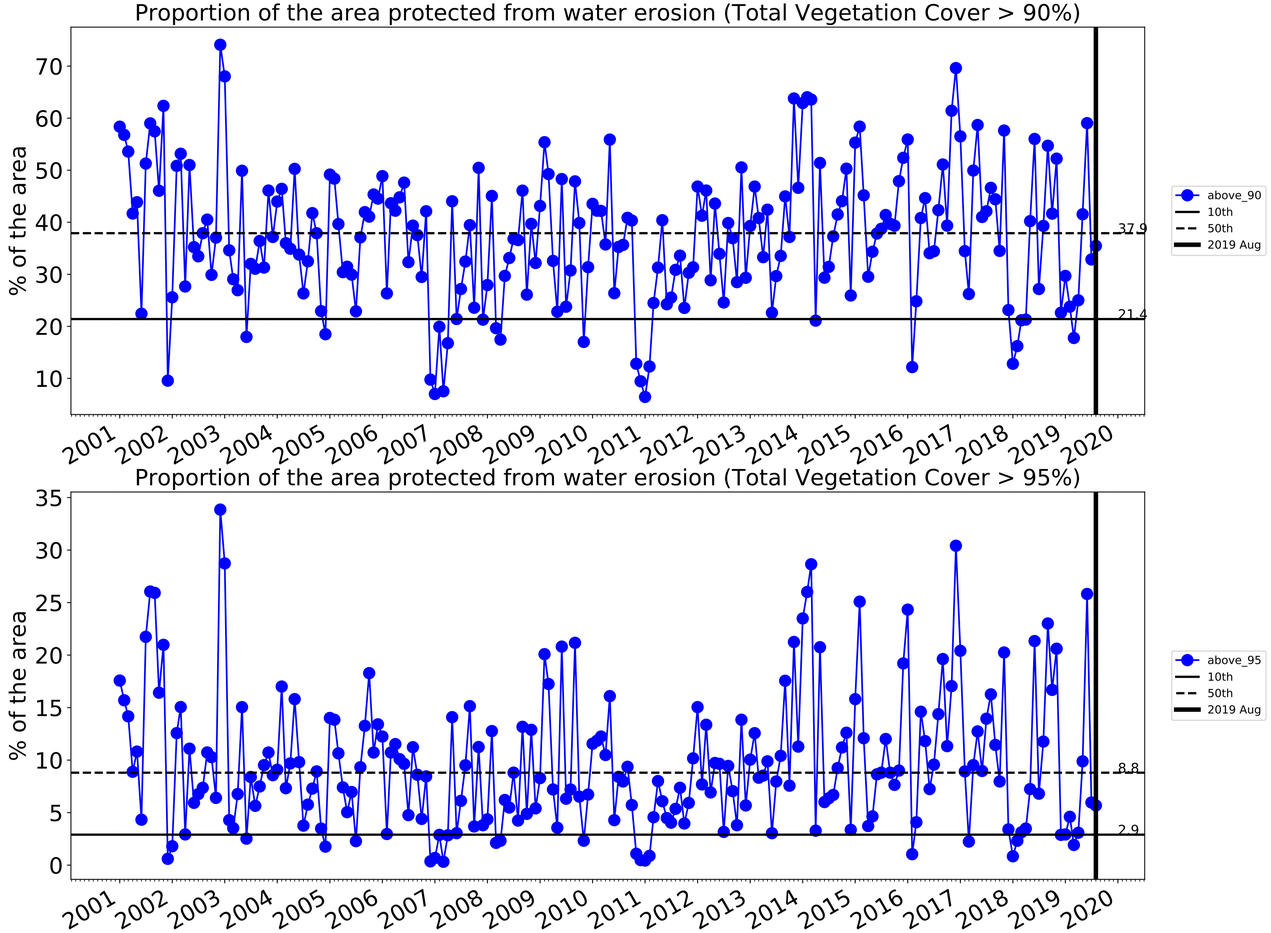
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



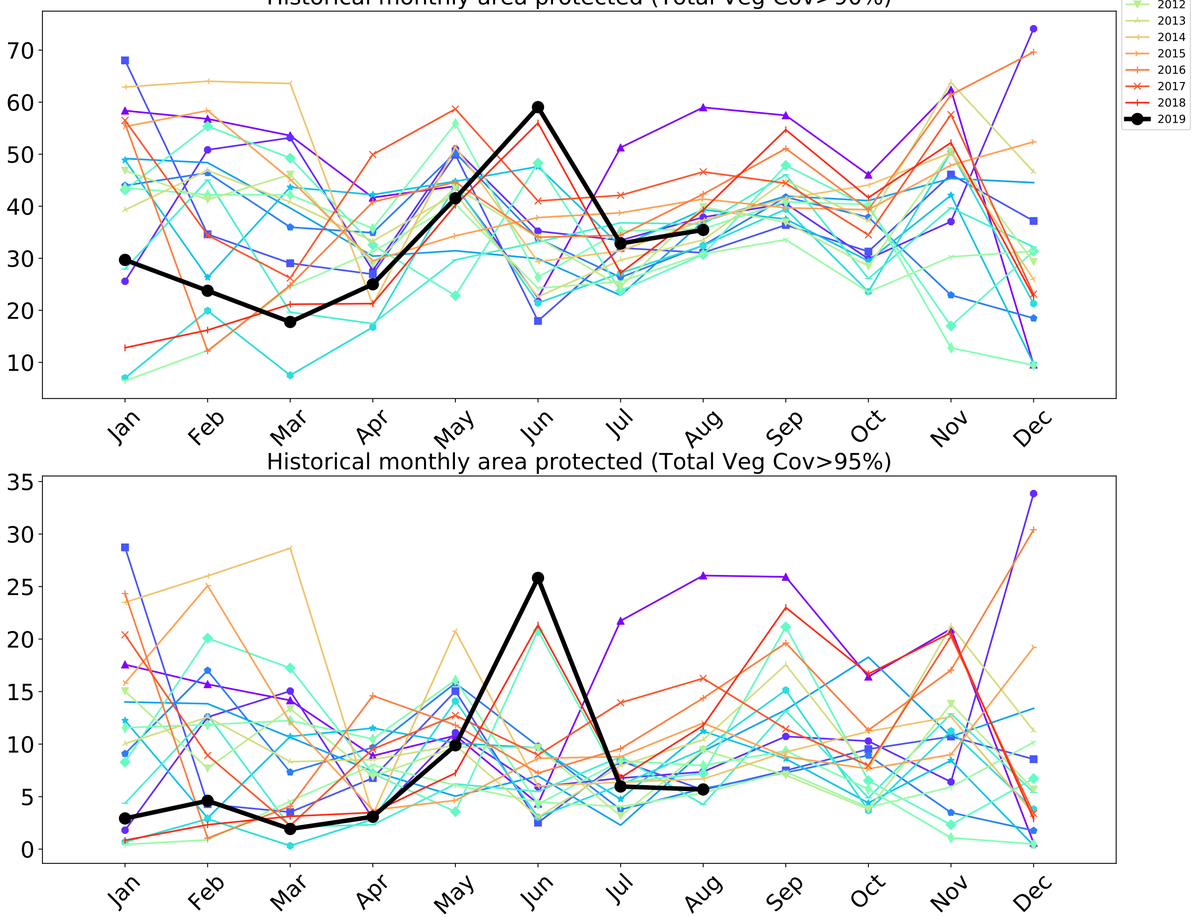
Historical monthly area protected (Total Veg Cov>80%)



Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)



Historical monthly area protected (Total Veg Cov>90%)



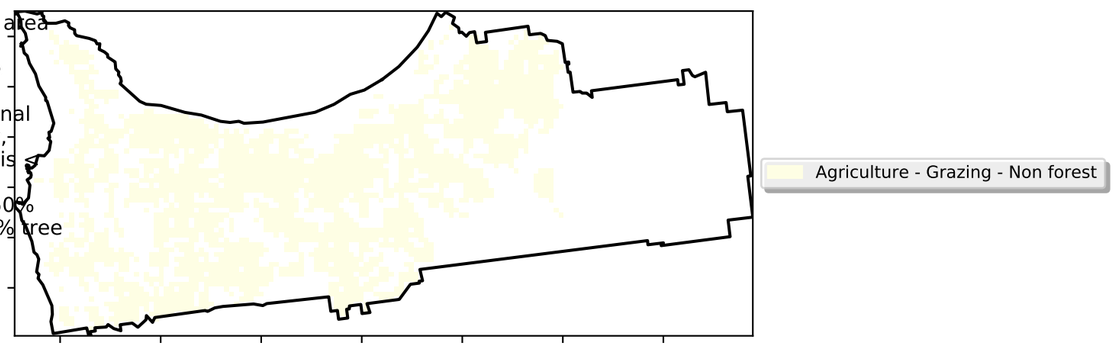
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)

Historical monthly area protected (Total Veg Cov>95%)

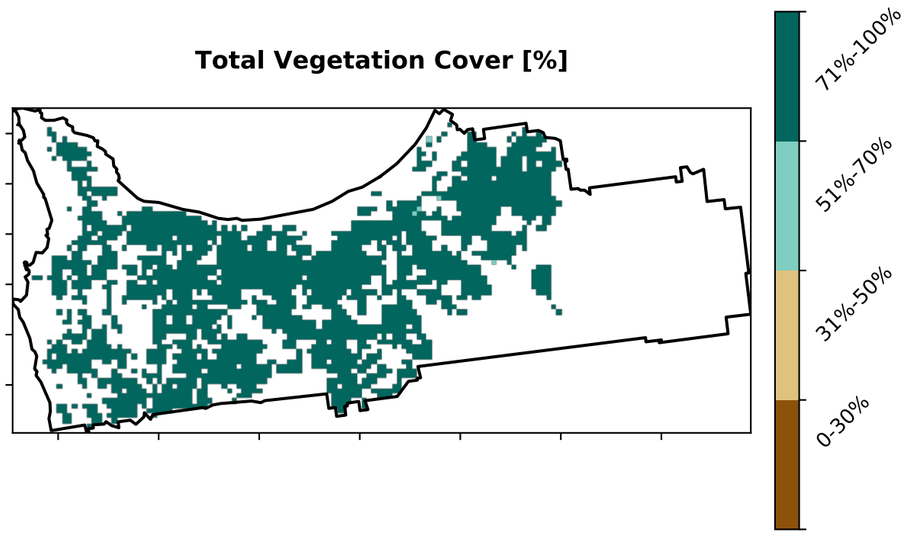
Grazing non forest

Land use and forest cover

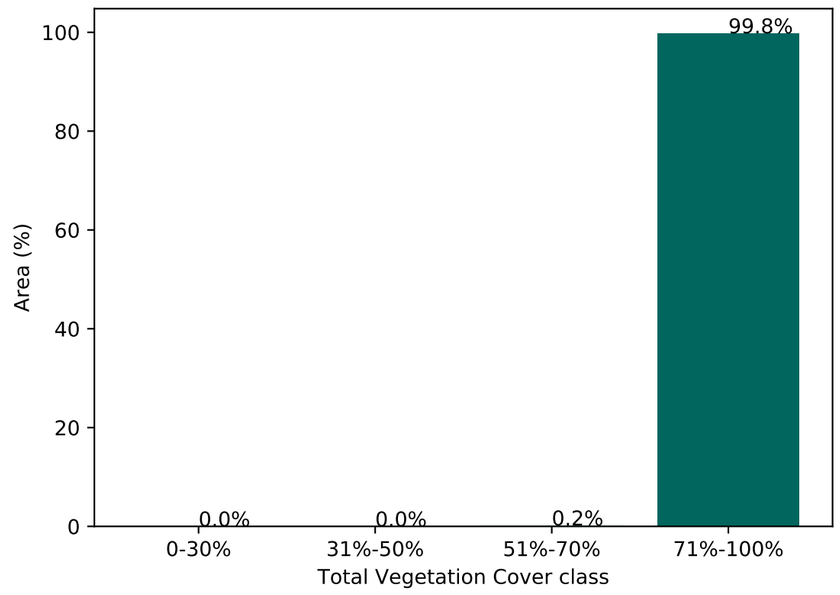
Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.



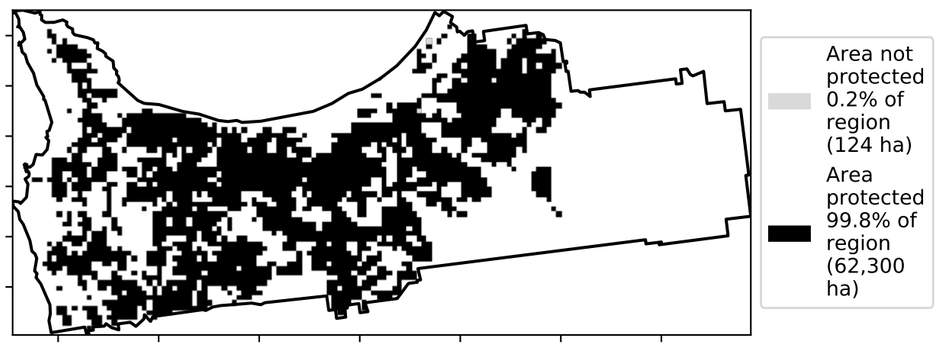
Total Vegetation Cover [%]



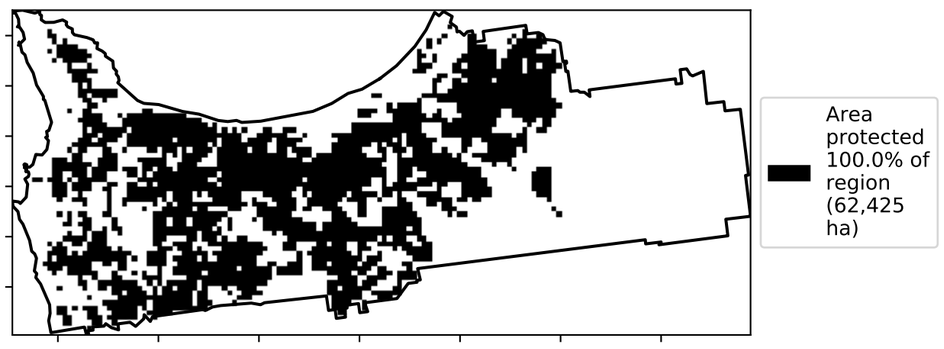
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

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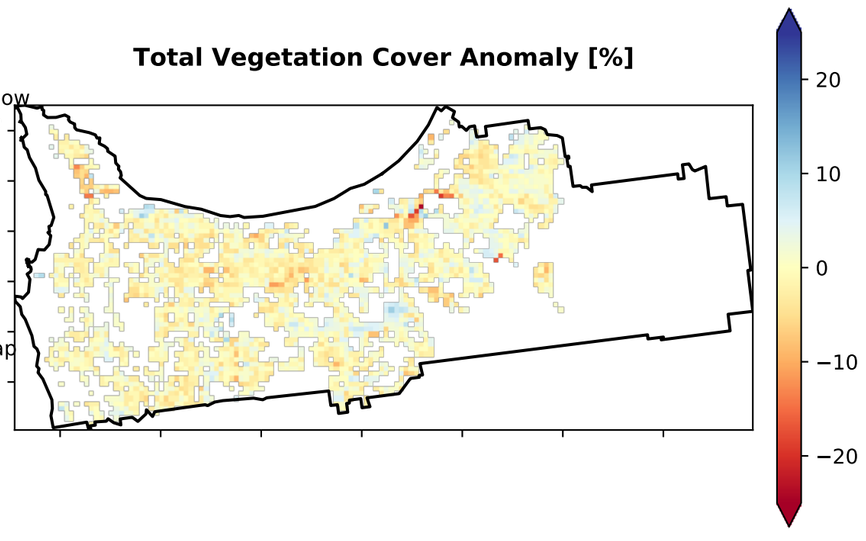
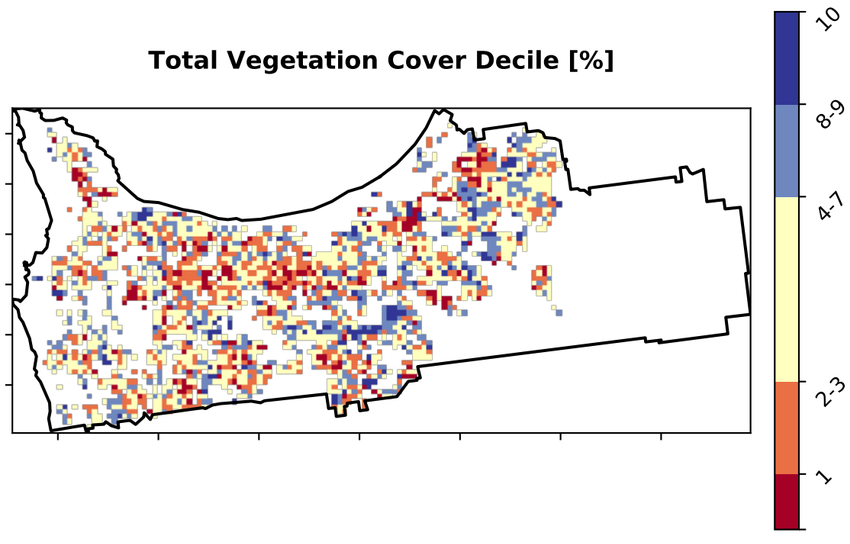


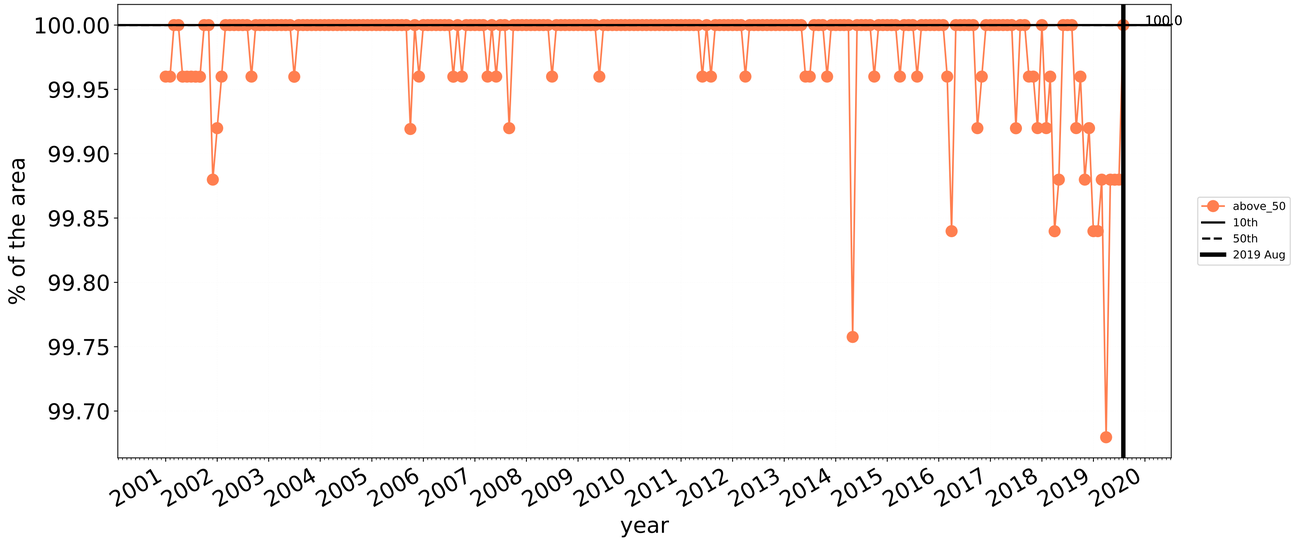
Total Vegetation Cover Decile [%]

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.

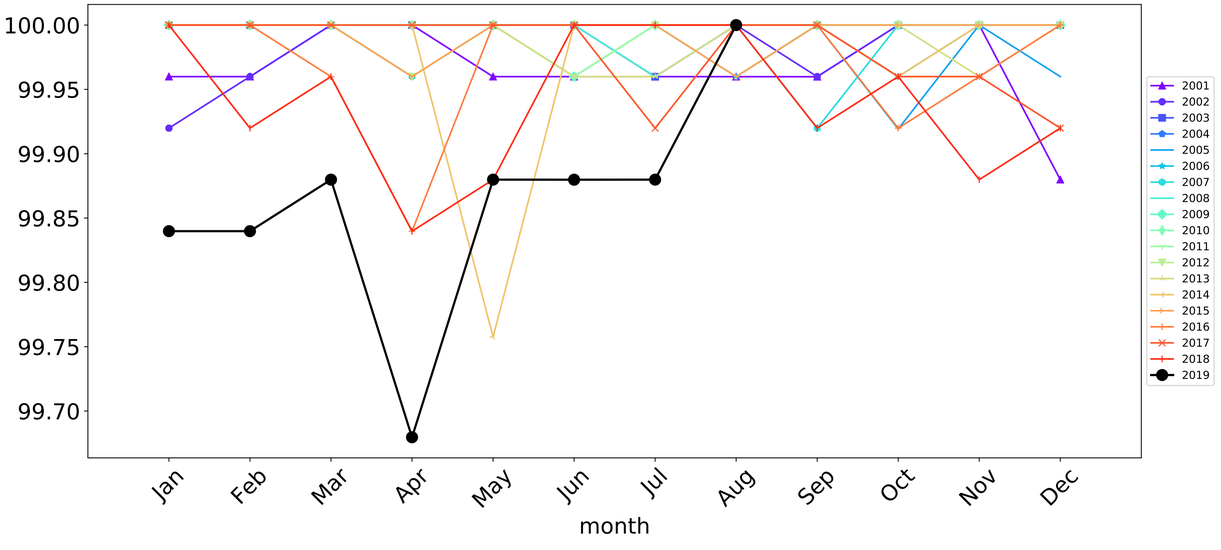


Grazing non forest timeseries

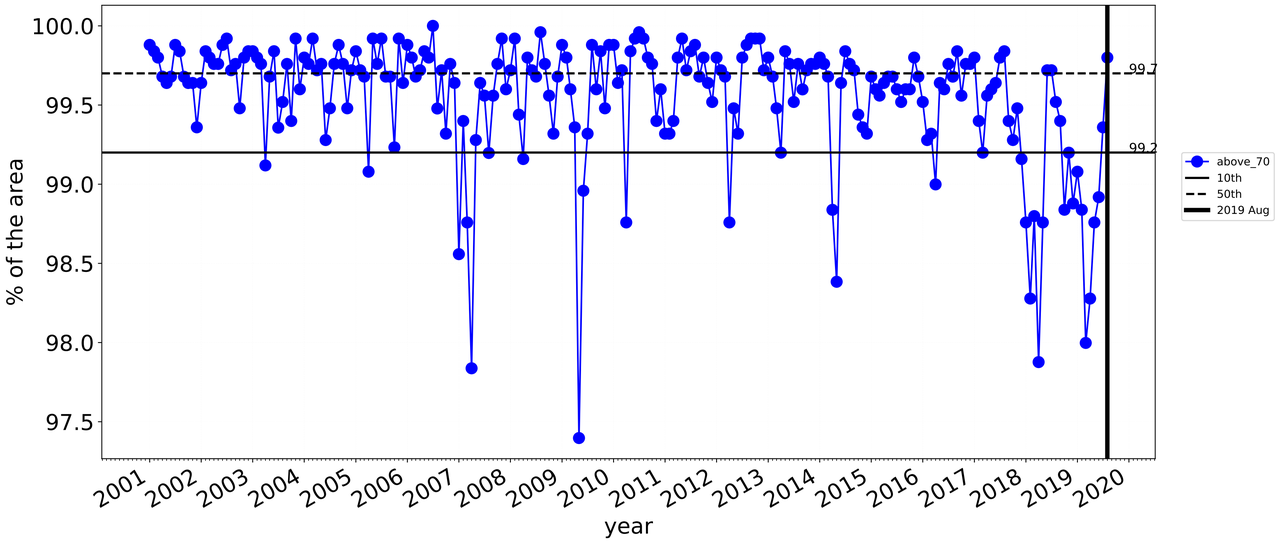
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



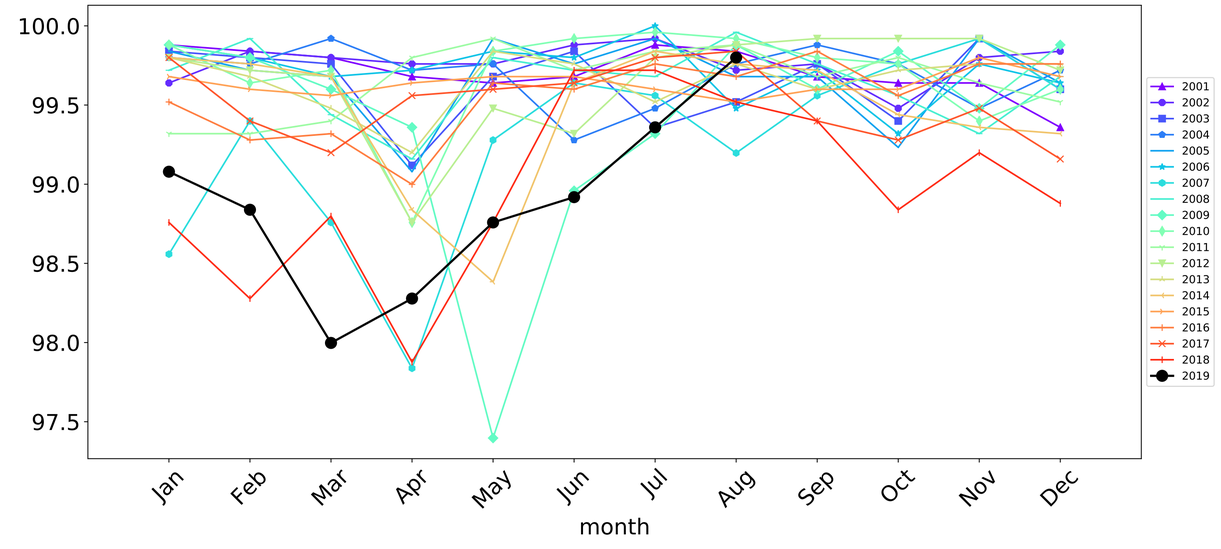
Wind erosion historical monthly area protected (Total Veg Cov >50%)



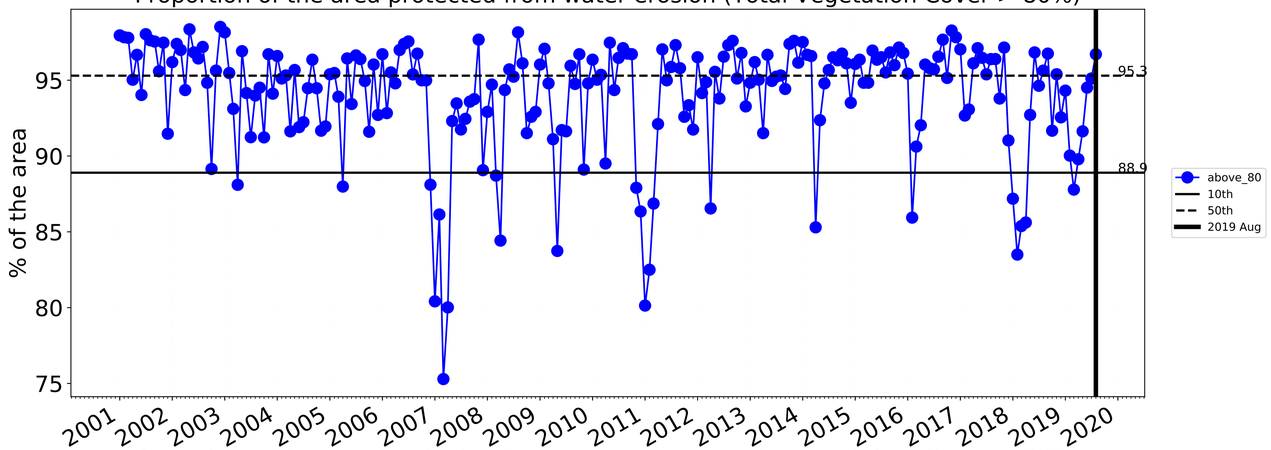
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



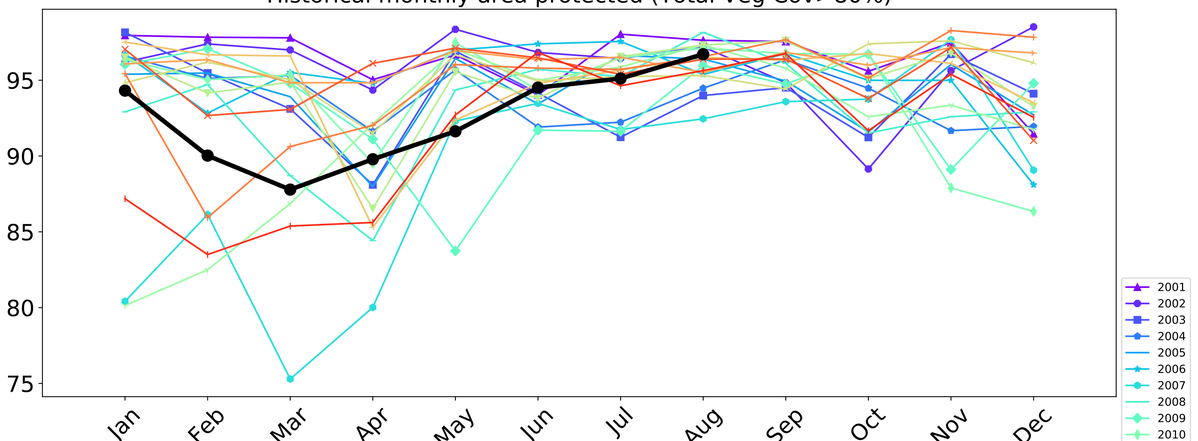
Water erosion historical monthly area protected (Total Veg Cov>70%)



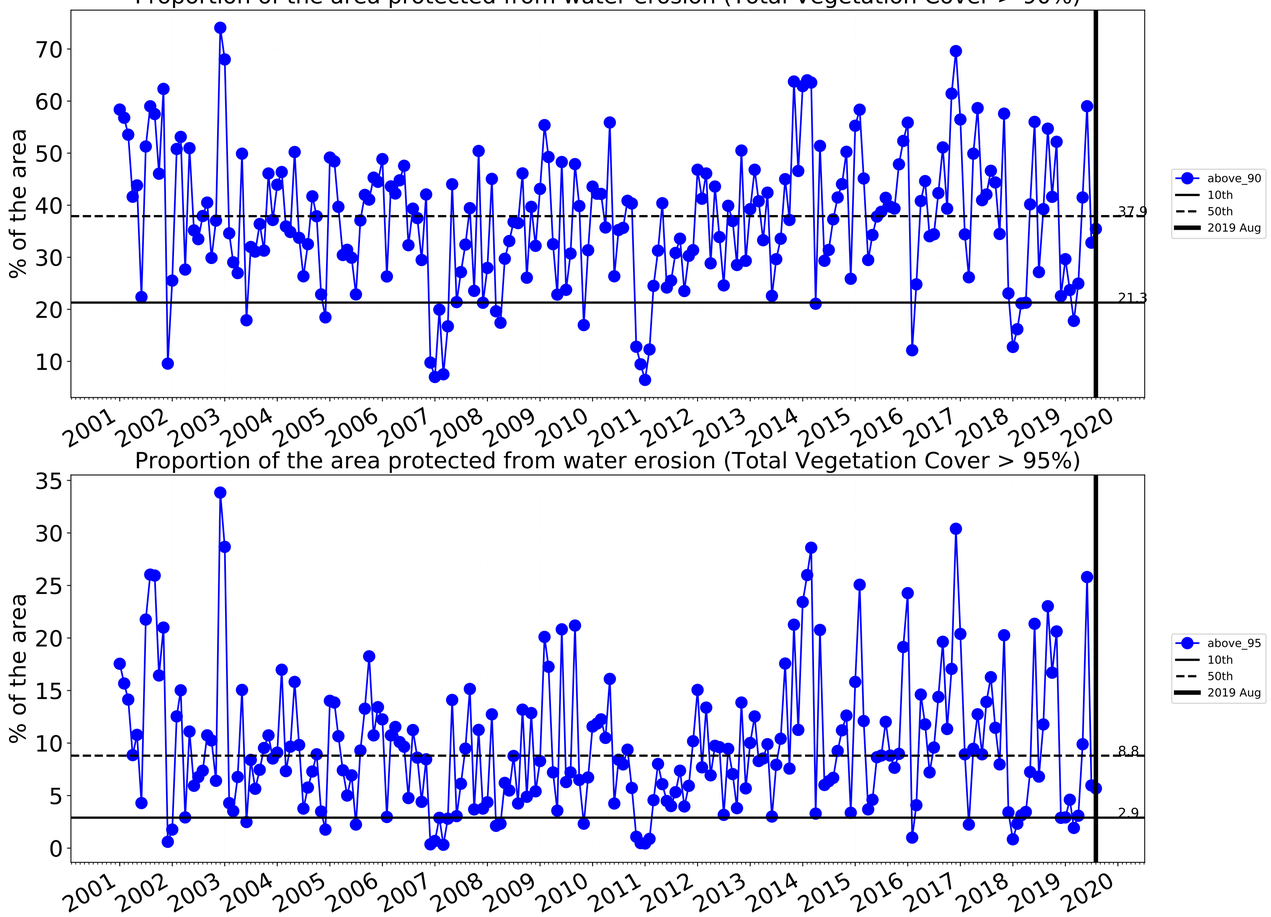
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



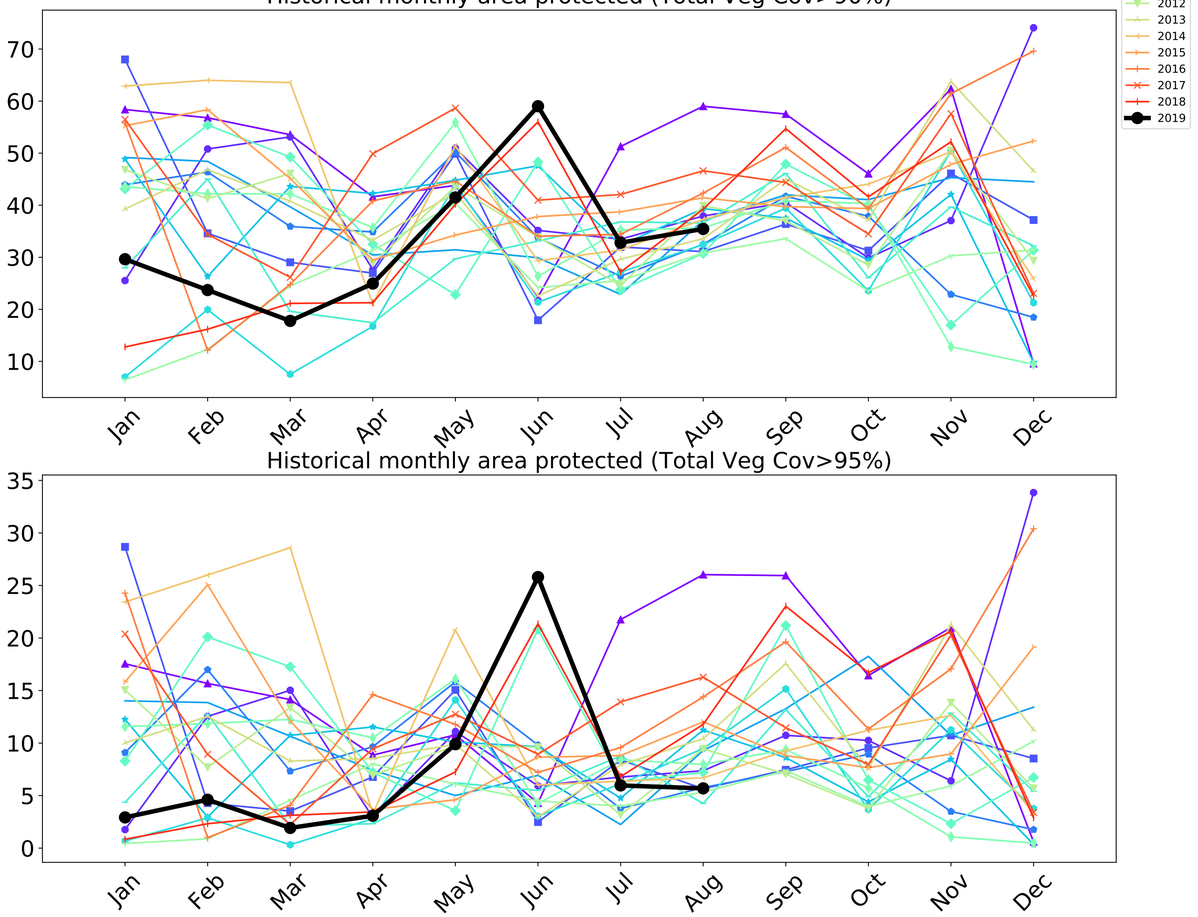
Historical monthly area protected (Total Veg Cov>80%)



Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)



Historical monthly area protected (Total Veg Cov>90%)



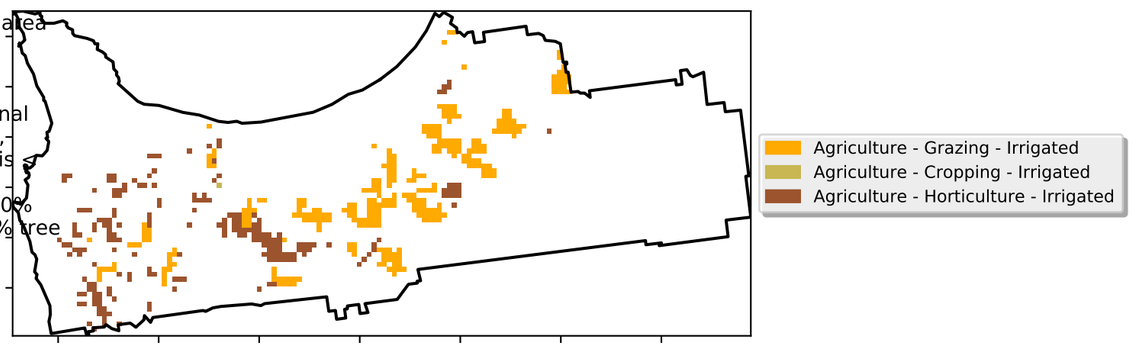
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)

Historical monthly area protected (Total Veg Cov>95%)

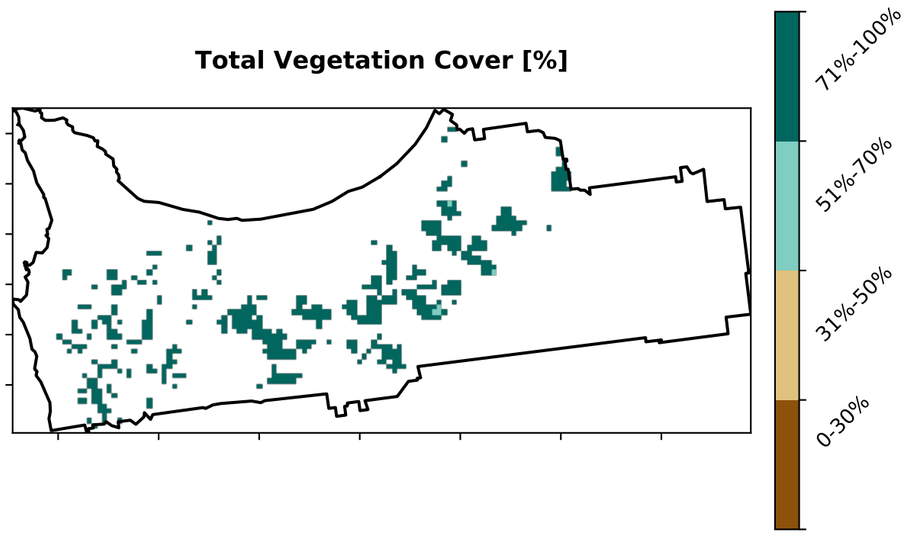
Irrigation

Land use and forest cover

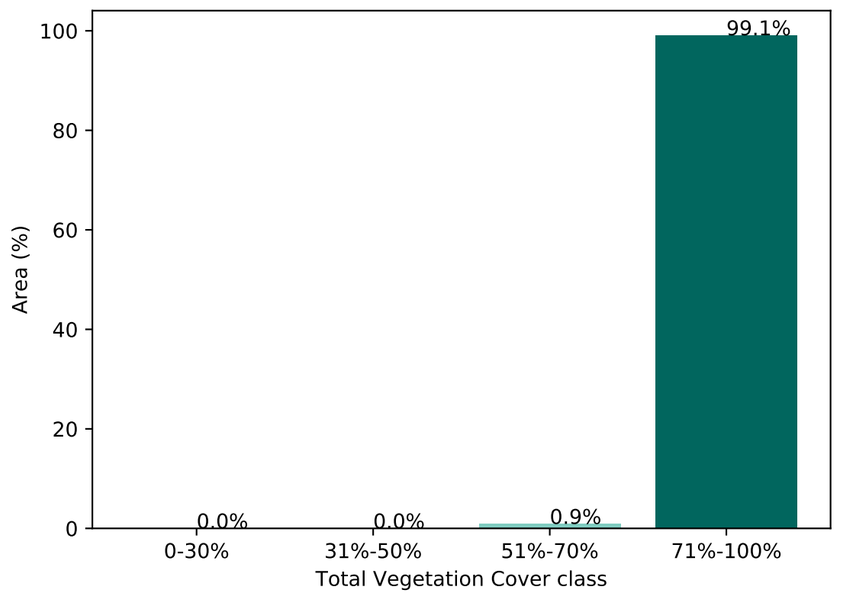
Landuse map of area based on 2015 catchment scale landuse and Australia's National Forest Inventory, where no forest is 20% tree cover, sparse is 20 to 50% and dense > 50% tree cover.



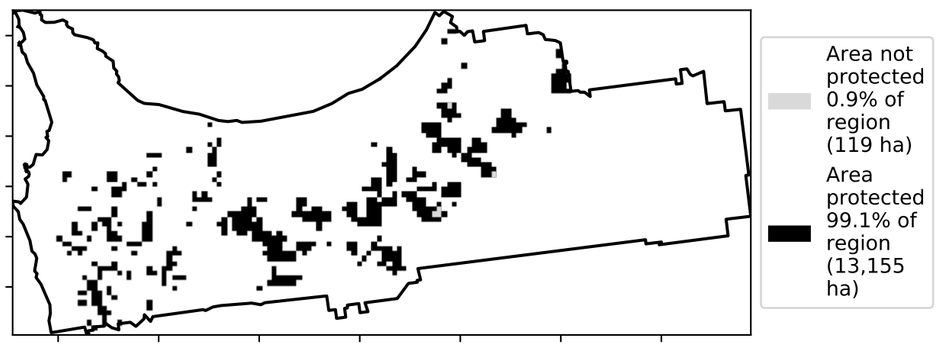
Total Vegetation Cover [%]



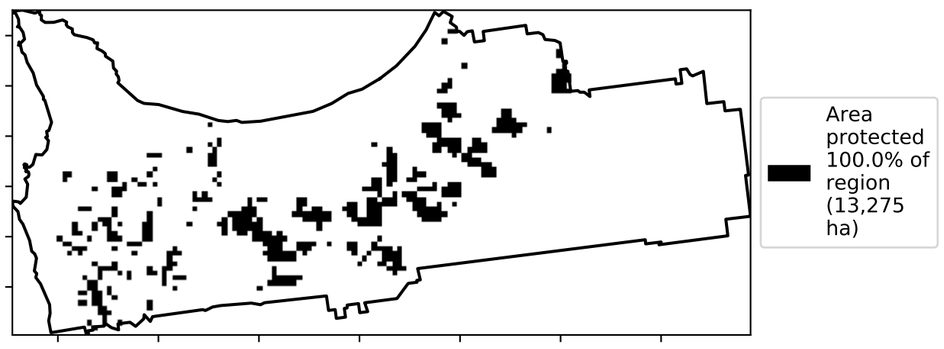
Proportion of vegetation cover class in area



% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]

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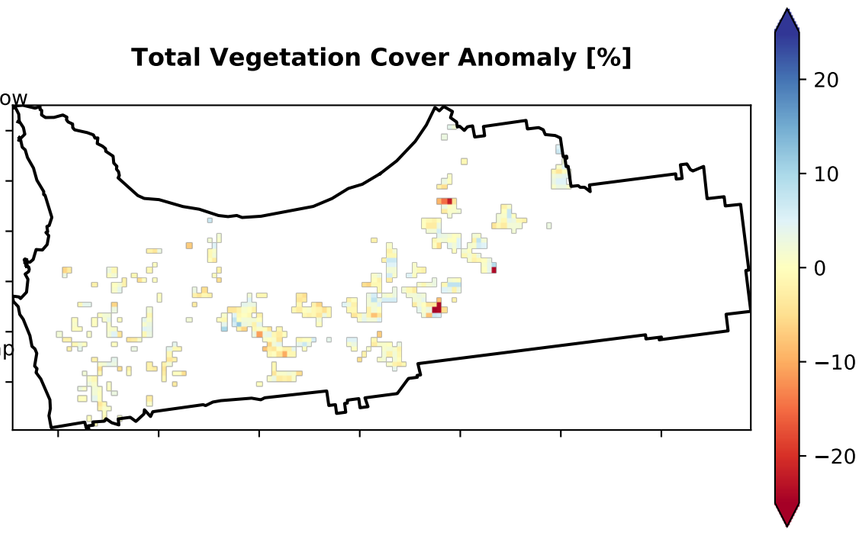
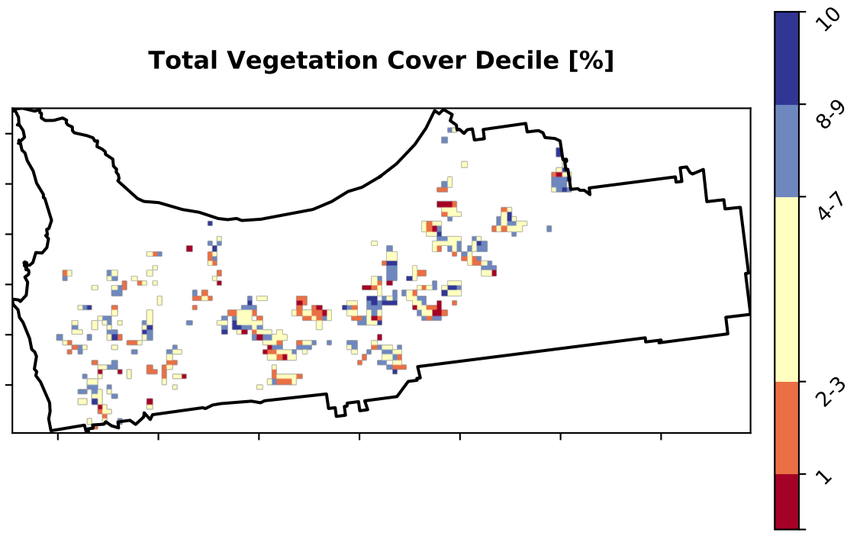


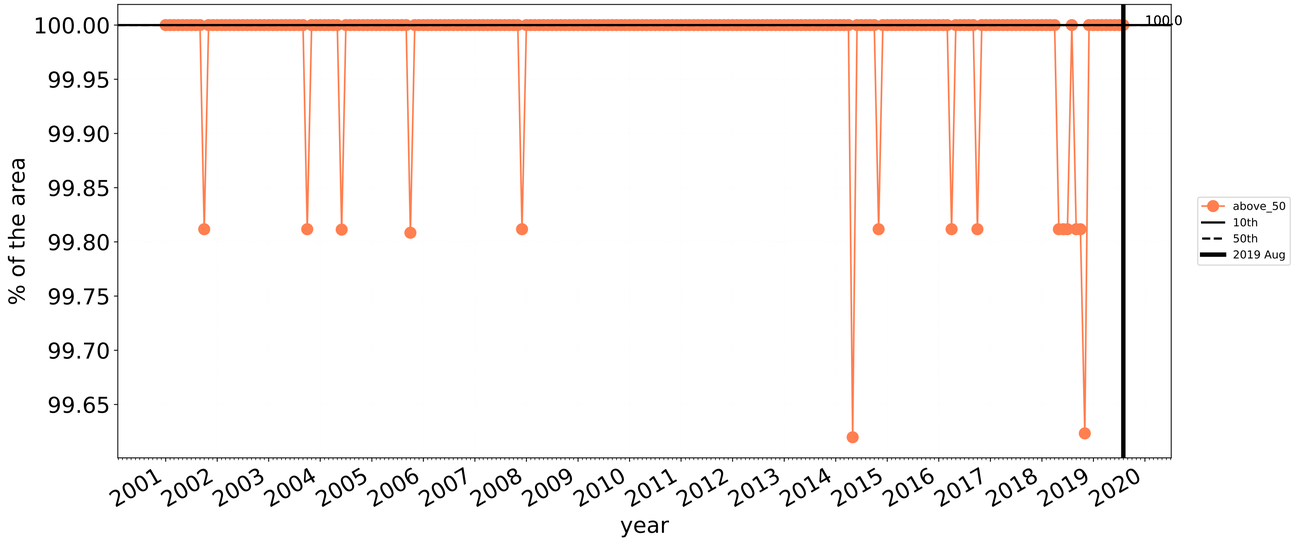
Total Vegetation Cover Decile [%]

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.

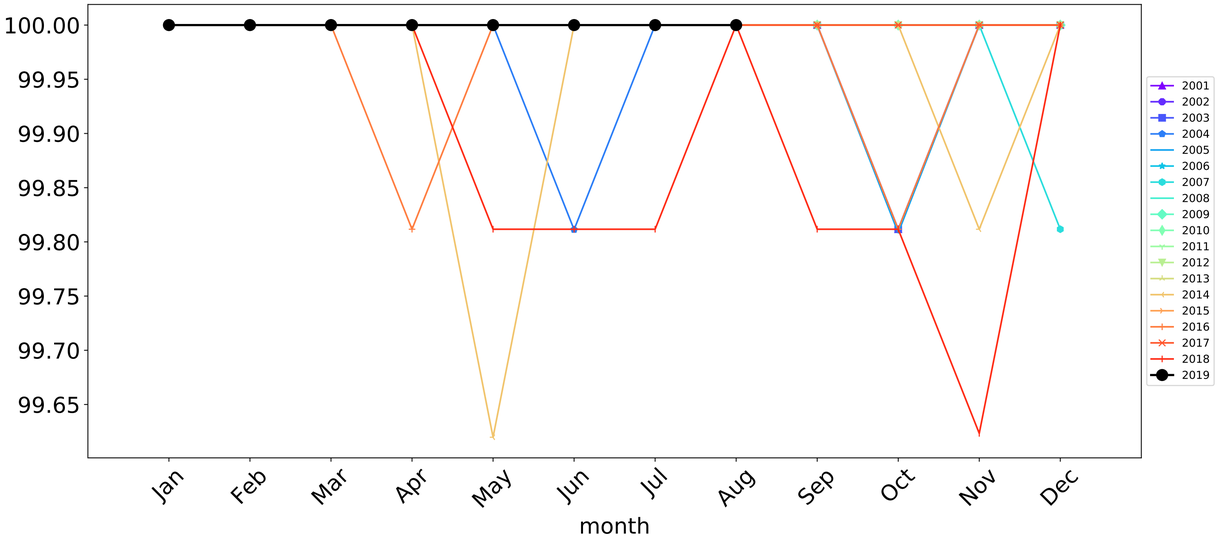


Irrigation timeseries

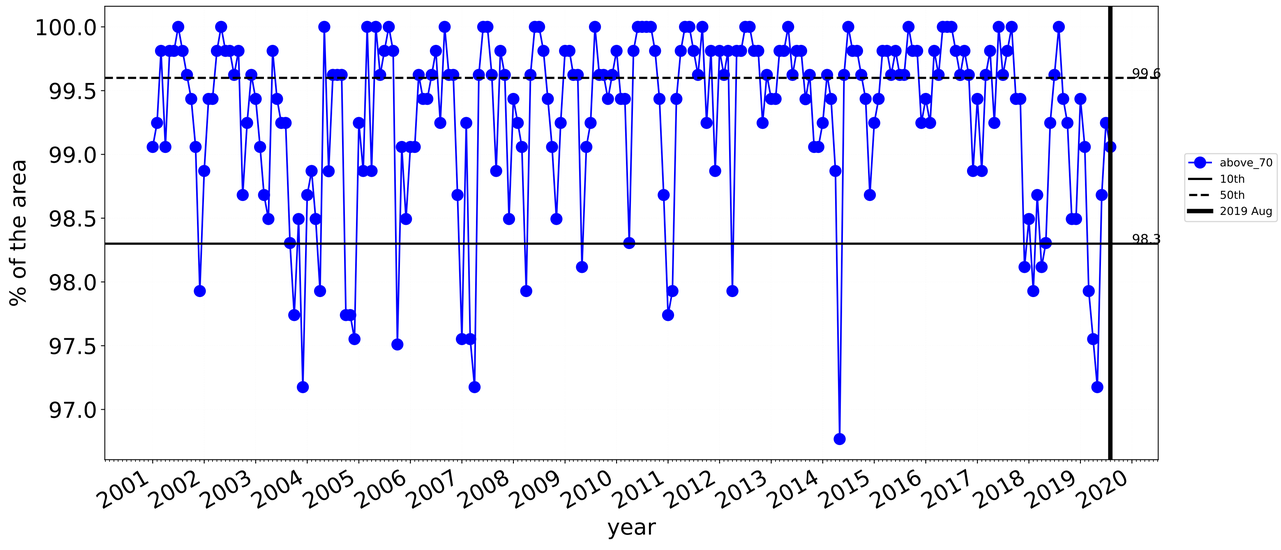
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



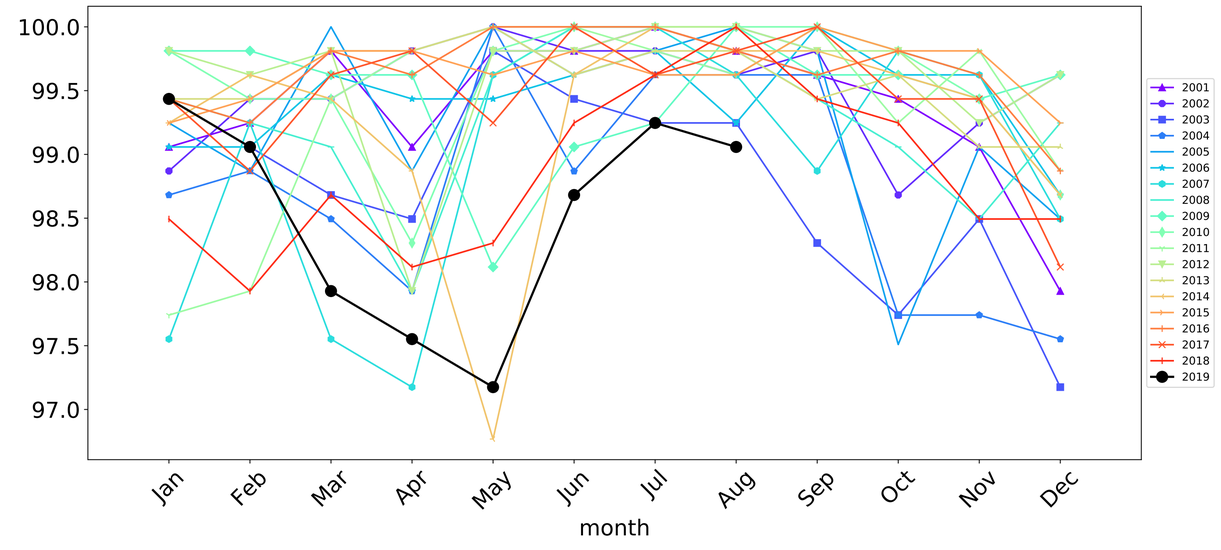
Wind erosion historical monthly area protected (Total Veg Cov >50%)

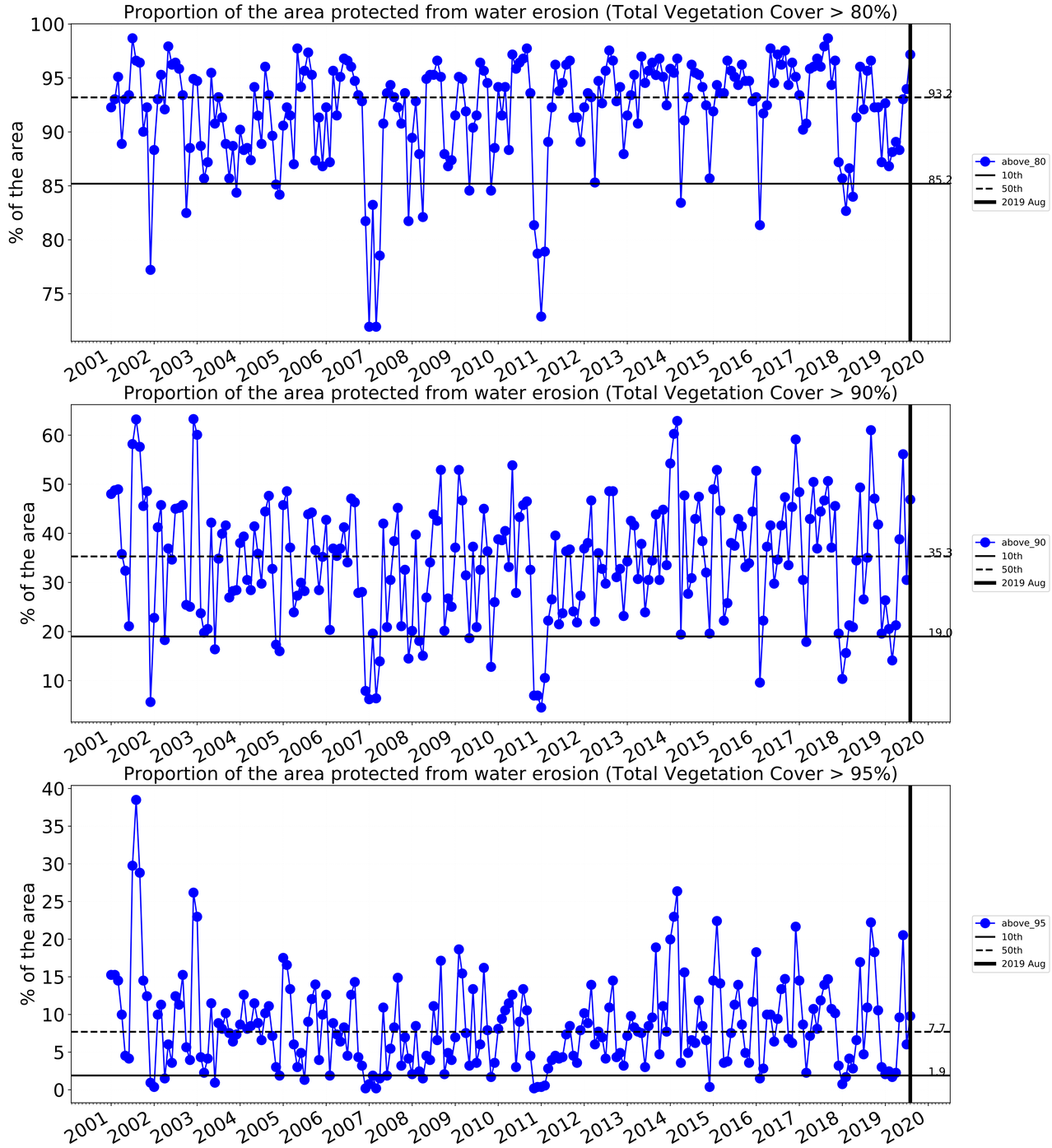


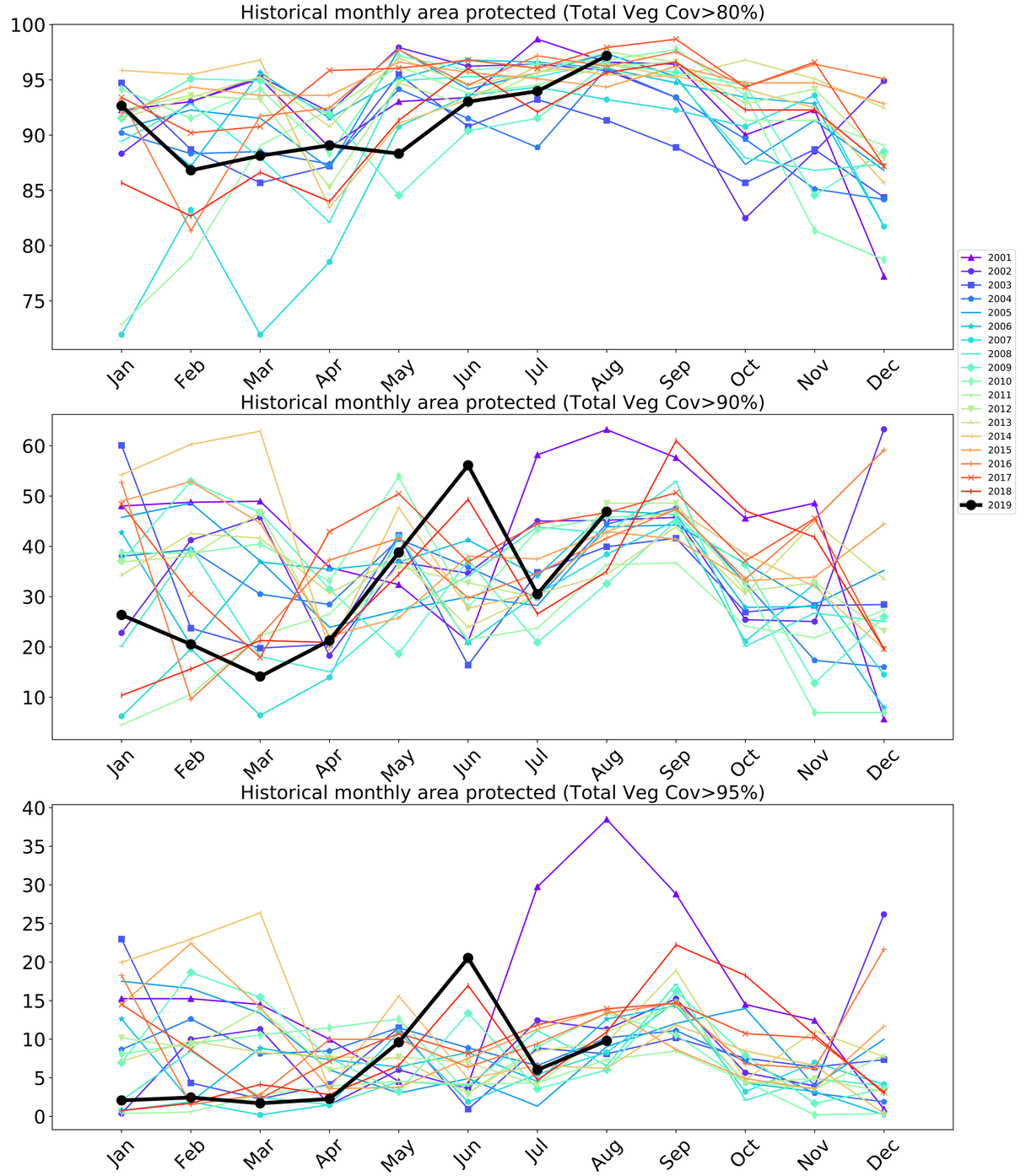
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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



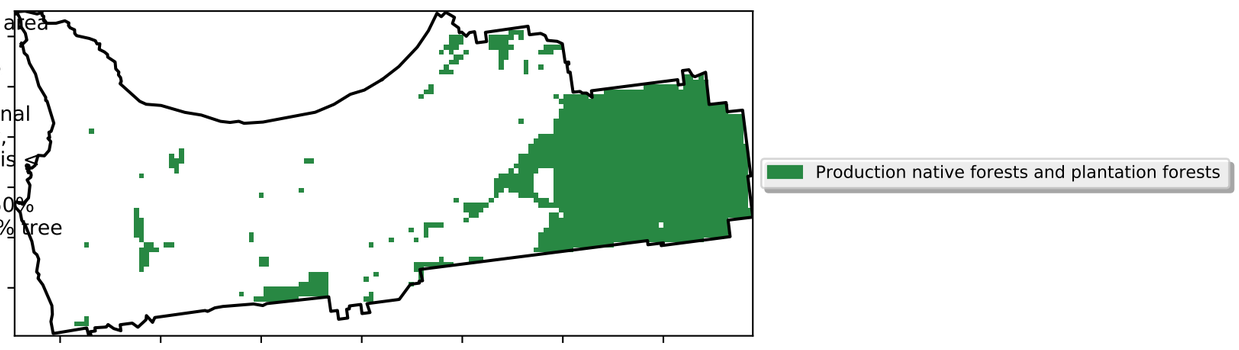

Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)
% of the area
93.2
85.2
above_80
10th
50th
2019 Aug
Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)
% of the area
35.3
19.0
above_90
10th
50th
2019 Aug
Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)
% of the area
7.7
1.9
above_95
10th
50th
2019 Aug

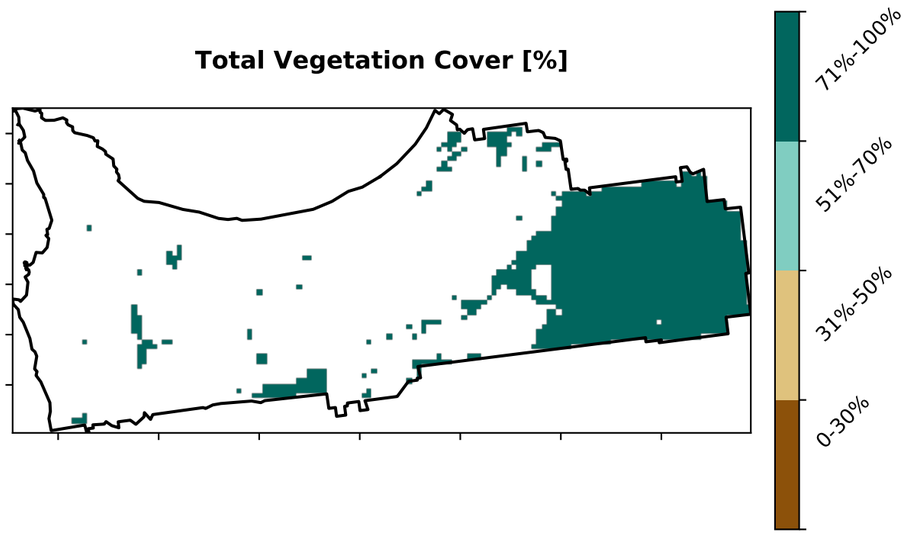

Historical monthly area protected (Total Veg Cov>80%)
Historical monthly area protected (Total Veg Cov>90%)
Historical monthly area protected (Total Veg Cov>95%)
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019

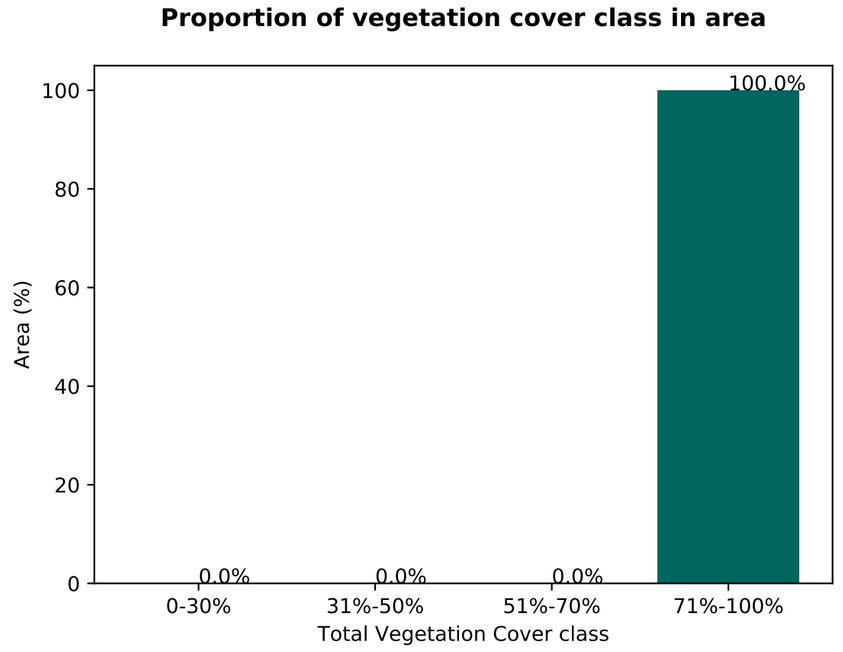
Production native forests and plantation forests

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.





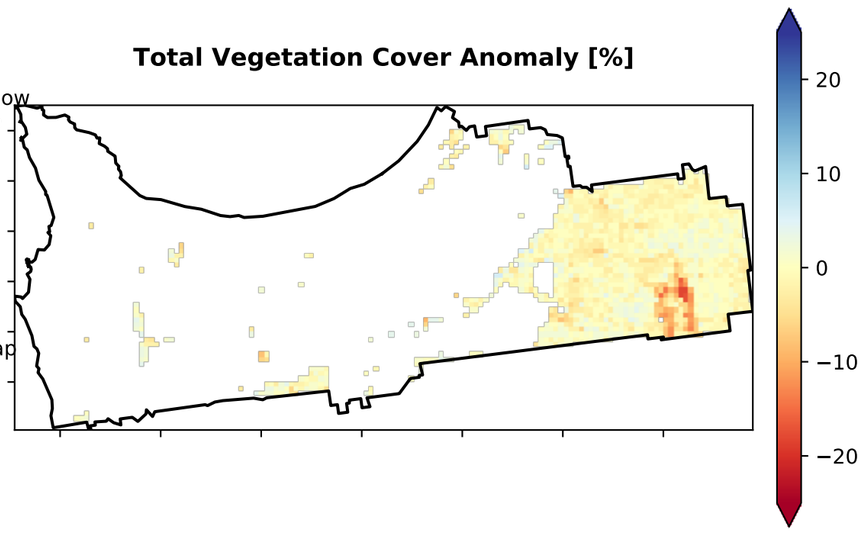


% Area protected from water erosion (>70%)

% Area protected from wind erosion (>50%)

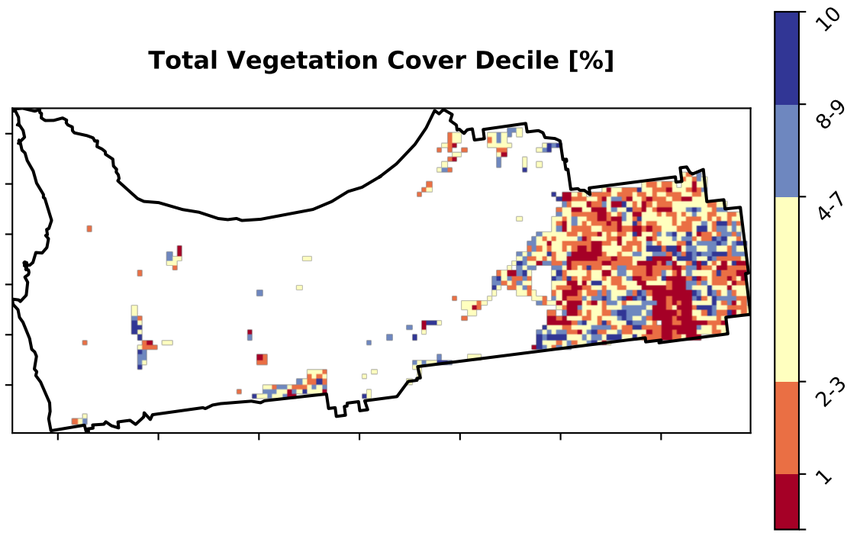
Total Vegetation Cover Anomaly [%]

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



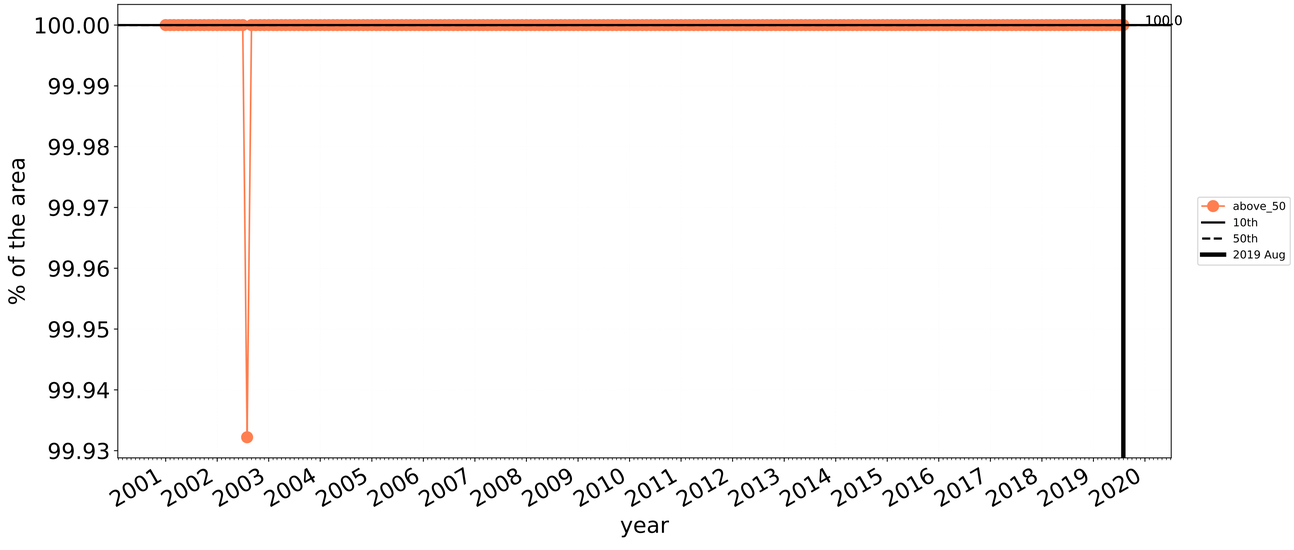
Total Vegetation Cover Decile [%]

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.

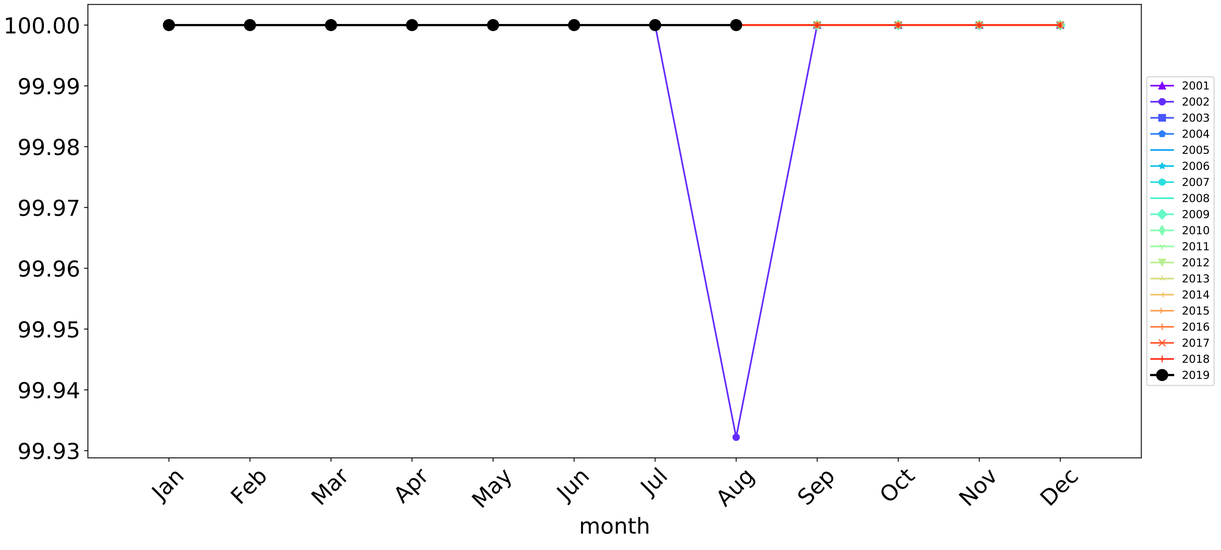


Production native forests and plantation forests timeseries

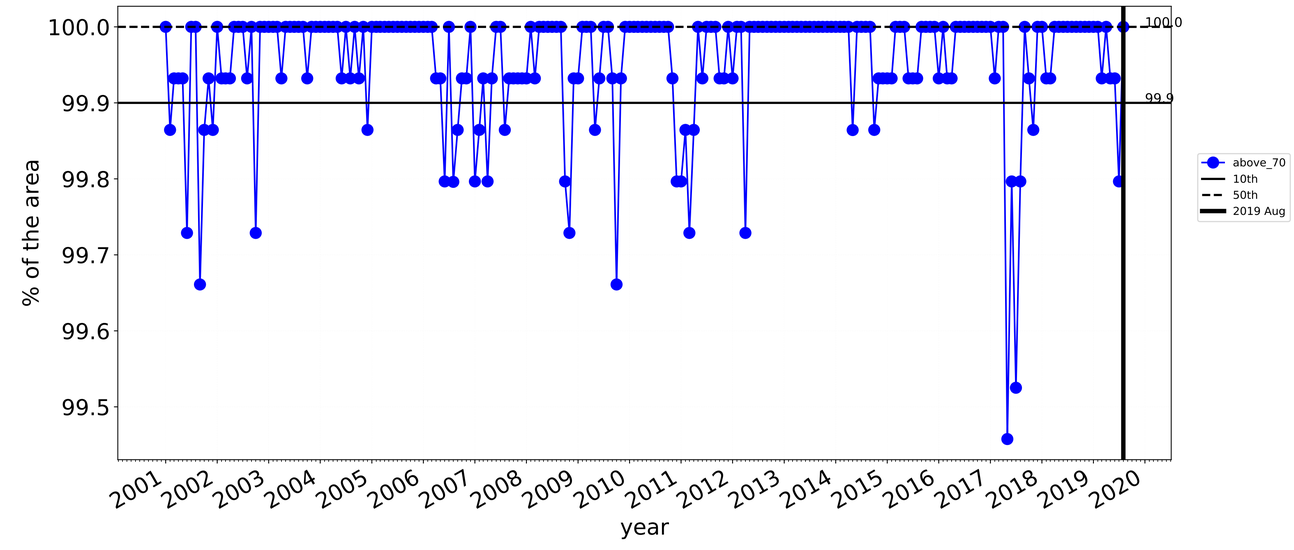
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



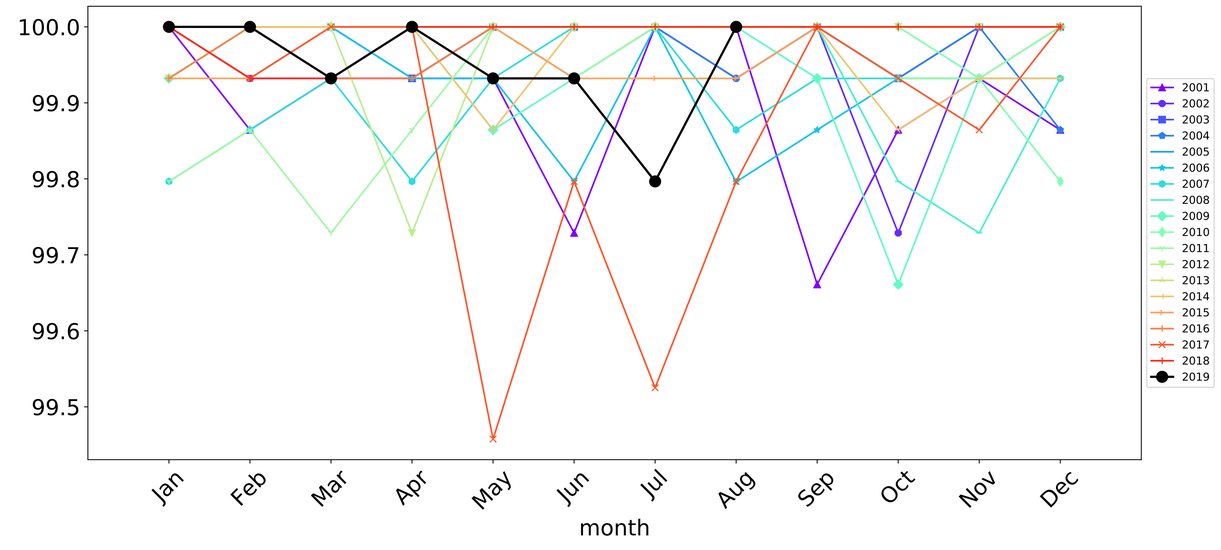
Wind erosion historical monthly area protected (Total Veg Cov >50%)



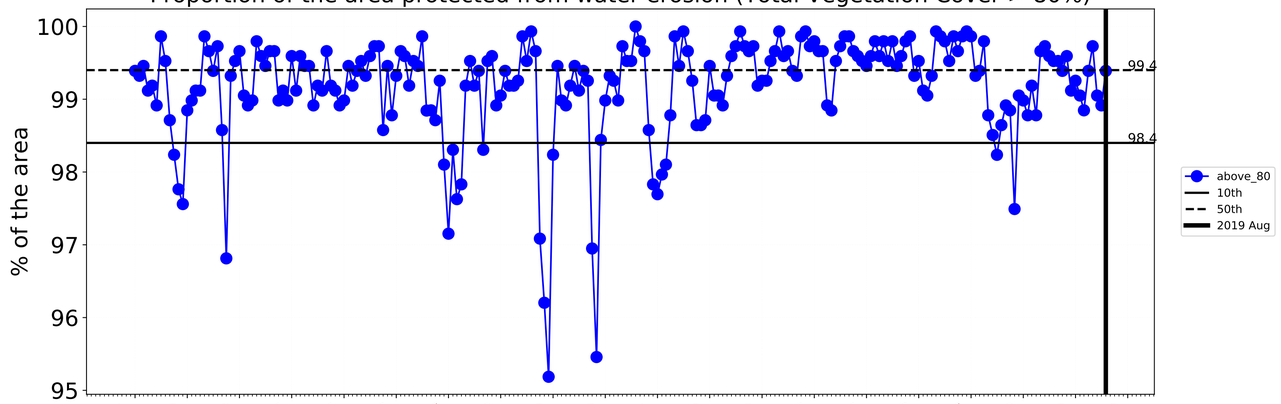
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



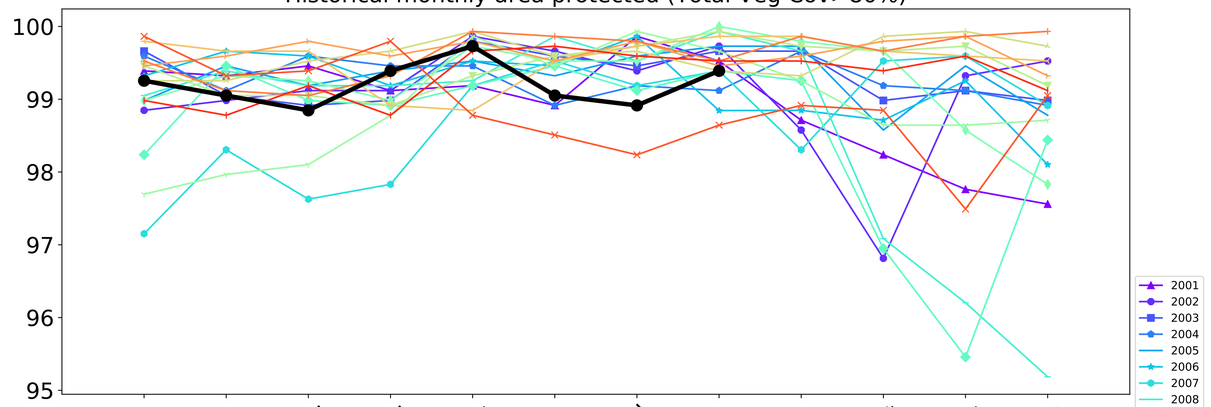
Water erosion historical monthly area protected (Total Veg Cov>70%)



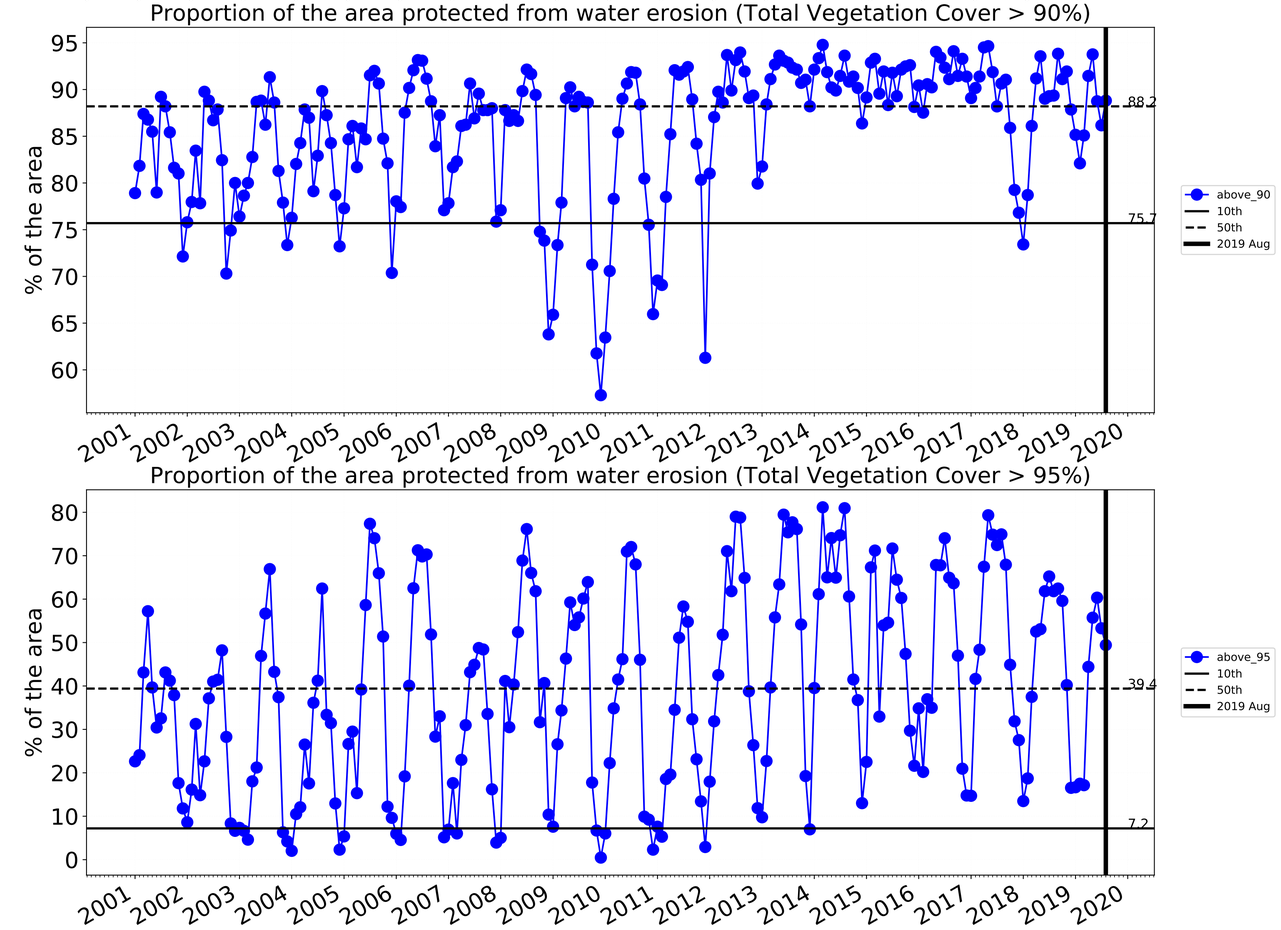
Proportion of the area protected from water erosion (Total Vegetation Cover > 80%)



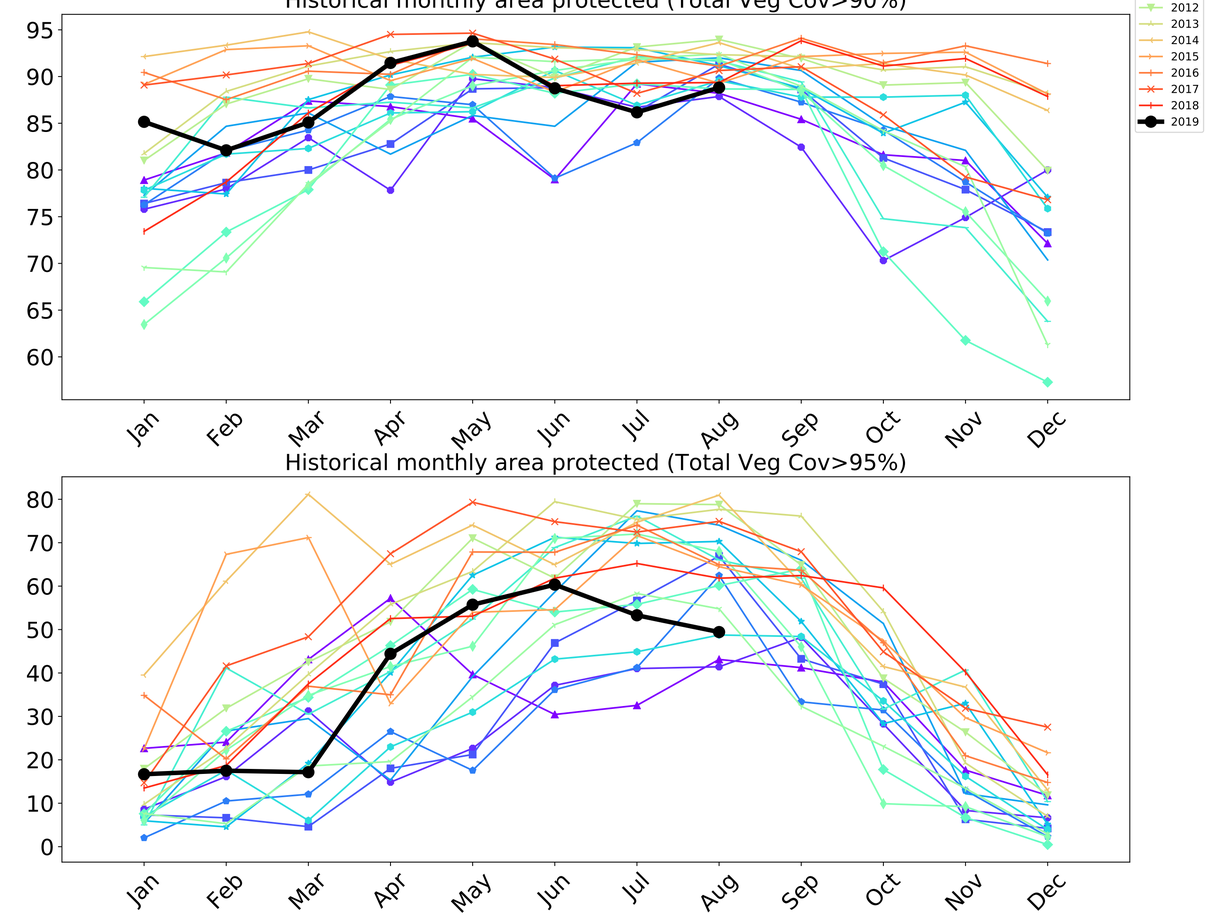
Historical monthly area protected (Total Veg Cov>80%)



Proportion of the area protected from water erosion (Total Vegetation Cover > 90%)



Historical monthly area protected (Total Veg Cov>90%)



Proportion of the area protected from water erosion (Total Vegetation Cover > 95%)

Historical monthly area protected (Total Veg Cov>95%)

Busselton_(C) (144,525 ha and no data 785 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	144,525	99.9% 144,350	99.8% 144,225	98.3% 142,100	94.9% 137,200	54.5% 78,825	20.3% 29,375
Conservation and natural environments	25,147	99.9% 25,121	99.7% 25,070	98.3% 24,714	95.4% 24,001	68.4% 17,206	24.5% 6,159
Conservation and natural environments non forest	6,648	100.0% 6,648	99.6% 6,620	95.5% 6,345	86.0% 5,714	49.2% 3,269	10.7% 714
Conservation and natural environments Woodland forest	4,046	100.0% 4,046	100.0% 4,046	99.4% 4,022	98.2% 3,972	63.4% 2,566	16.5% 666
Conservation and natural environments Forest (non woodland)	14,452	99.8% 14,427	99.7% 14,402	99.1% 14,328	98.6% 14,253	77.8% 11,249	32.5% 4,693
Agriculture	80,500	100.0% 80,500	100.0% 80,500	99.7% 80,234	96.8% 77,923	37.5% 30,154	6.4% 5,154
Grazing	62,145	100.0% 62,145	100.0% 62,145	99.8% 62,021	96.7% 60,106	35.5% 22,033	5.7% 3,531
Grazing non forest	62,145	100.0% 62,145	100.0% 62,145	99.8% 62,021	96.7% 60,104	35.4% 22,026	5.7% 3,534
Irrigation	13,151	100.0% 13,151	100.0% 13,151	99.1% 13,027	97.2% 12,780	46.9% 6,167	9.8% 1,287
Production native forests and plantation forests	36,709	100.0% 36,709	100.0% 36,709	100.0% 36,709	99.4% 36,485	88.8% 32,602	49.4% 18,143