Total vegetation cover soil protection
Region:LGA Esperance_(S) WA   Date: October 2019

This report describes vegetation protecting the soil surface from erosion during a chosen month compared to previous years. This report has been generated using MODIS fractional vegetation cover information available in Rangelands and Pasture Productivity (RAPP) map tool https://map.geo-rapp.org/#australia. The report is based on 500 metre pixel data on monthly time steps.
Land use forest cover:

Results can be shown for the whole region (polygon), and separated by land use and forest cover classes which are likely to show different cover patterns and targets. Land use is divided into four broad classes: Conservation and natural environments, Agriculture, production native forests and plantation forests (no report), and other (no report). Agriculture is divided into grazing, crops and horticulture which are sub-divided into non-irrigated and irrigated. If forest is present land use is further divided into: non-forest, woodland forest and non-woodland forest. The area of each land use and forest class are shown as a map and chart. The report content is repeated for each land use and forest cover class that covers at least 1% of the area of the chosen region.
Total vegetation Cover:

The total vegetation cover indicates where soil is likely to be protected from wind and or water hillslope erosion. Total vegetation cover for this month is shown on a map and chart classified into 4 classes.
  • 71-100% High cover – protected from wind and usually water erosion (high rainfall, steep
slopes, and erodible soils may need greater than 80, 90, 95 and up to 100% cover)
  • 51-70% Moderate cover – protected from wind erosion
  • 31-50% Low cover – not protected
  • 0-30% Very Low cover – not protected
Erosion protection: Wind erosion 50% total vegetation cover

The vegetation cover threshold required to prevent soil erosion is usually 50% to reduce wind erosion, 70% or 80% to reduce water (hillslope) erosion depending on the steepness and rainfall. Areas protected from erosion for the month:
  • Map: water erosion protection (>70% cover) percentage area and hectares.
  • Map: wind erosion protection (>50% cover) percentage area and hectares.
Comparison with previous years:

  • Map: anomaly comparing this month to the average cover from the same month in previous years.
  • Map: deciles rank of month against the same month in previous years.
Anomalies and deciles until September 2019 are calculated comparing to the same months 2001 to 2019. Extra monthly data will be used to calculate anomalies and deciles post September 2019 as they become available.
Time series monthly from January 2001 to current:

Erosion protection
  • Wind erosion protection time series: percentage of the area of the region with greater than 50% cover for
      each month (orange lines). Horizontal lines are 10th (cover target) and 50th percentiles.
  • Water erosion protection time series: percentage of the area of the region with greater than 70% cover for
      each month (blue line). Horizontal lines are 10th (cover target) and 50th percentiles.
Rainfall
  • Millimetres rainfall each month (black line).
Each time series is also stacked by year. The black line shows the current year of data.
Water erosion protection for higher rainfall and steeper slopes:

Water erosion protection on higher slopes. As slope increases, more cover is required to control water erosion. The thresholds reported are:
  • the percentage area with pixels greater than 80% total cover.
  • the percentage area with pixels greater than 90% total cover.
  • the percentage area with pixels greater than 95% total cover.
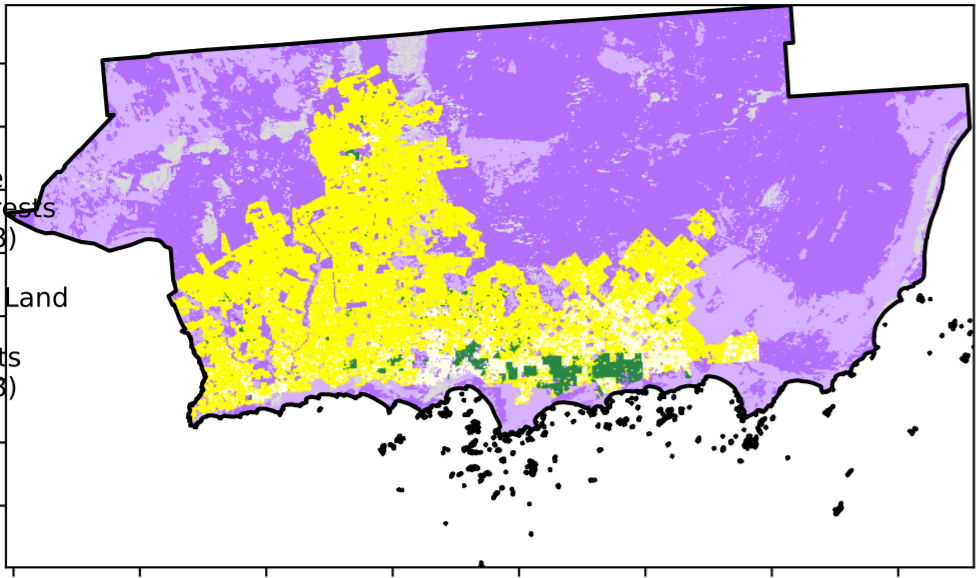
Acknowledgment of data:

1. http://www.agriculture.gov.au/abares/aclump/land-use/alum-classification

2. http://www.agriculture.gov.au/abares/forestsaustralia/sofr/sofr-2018

3. https://www.dpi.nsw.gov.au/agriculture/pastures-and-rangelands/establishment-mgmt/production-management2/groundcover
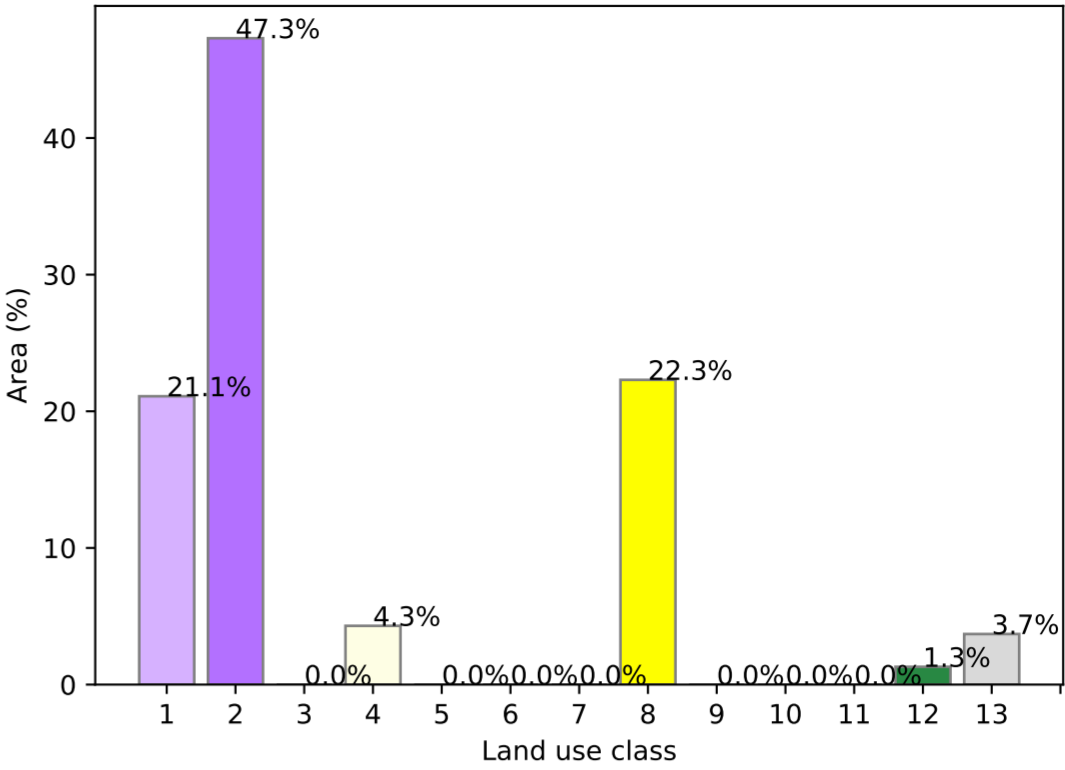
4. MODIS Fractional cover algorithm:

    https://doi.org/10.4225/08/5848a3f19a7b3
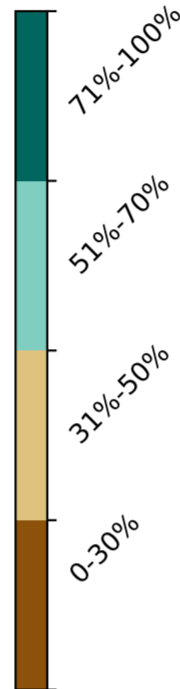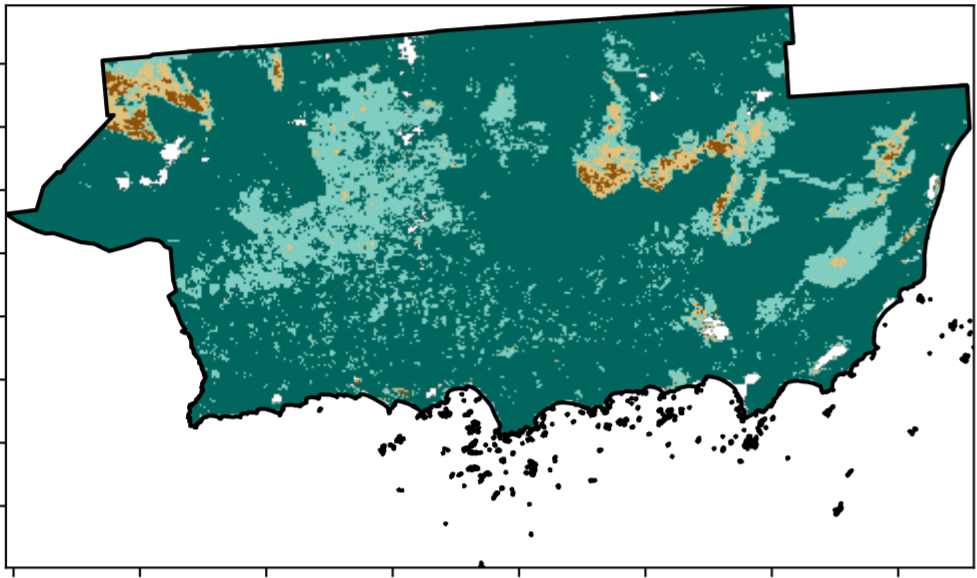
Vegetation Cover Oct 2019

Land use and forest cover

Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)
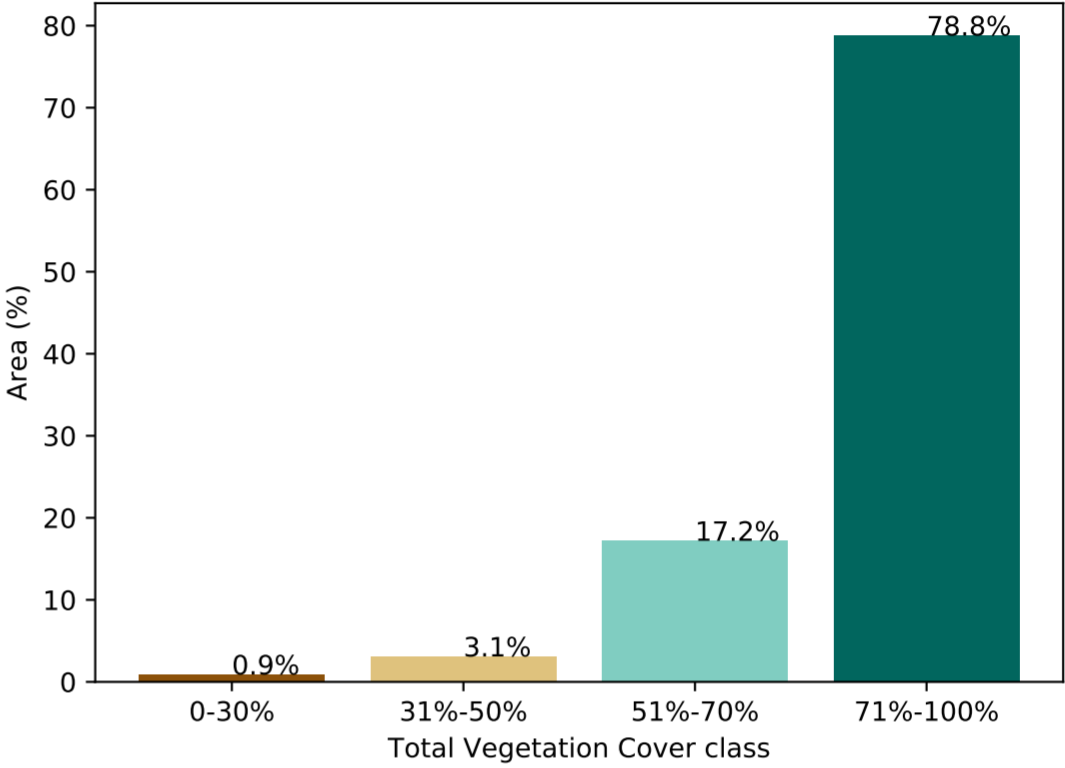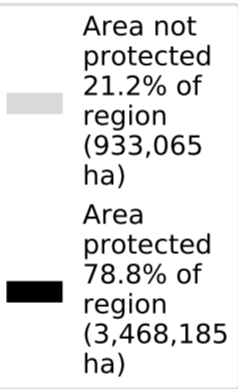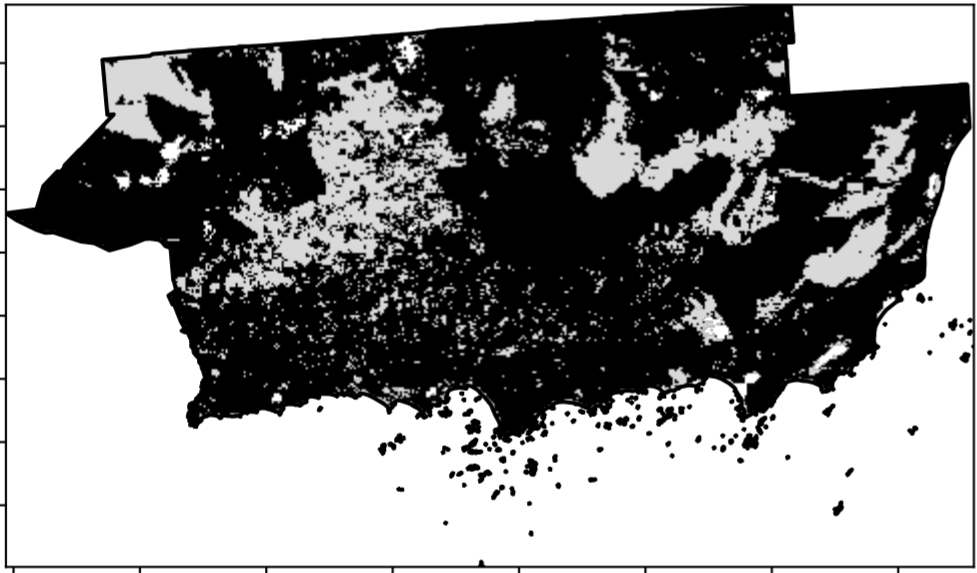
Legend with land class forest cover and number, i.e. Forests is 12
1 Conservation and natural environments - Non-forest
2 Conservation and natural environments - Woodland forest
3 Conservation and natural environments - Non-Woodland forest
4 Agriculture - Grazing - Non-forest
5 Agriculture - Grazing - 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

Total Vegetation Cover [%]

71%-100%
51%-70%
31%-50%
0-30%

Proportion of vegetation cover class in area

% Area protected from water erosion (>70%)

Area not protected 21.2% of region (933,065 ha)

Area protected 78.8% of region (3,468,185 ha)

% Area protected from wind erosion (>50%)

Area not protected 4.0% of region (176,050 ha)
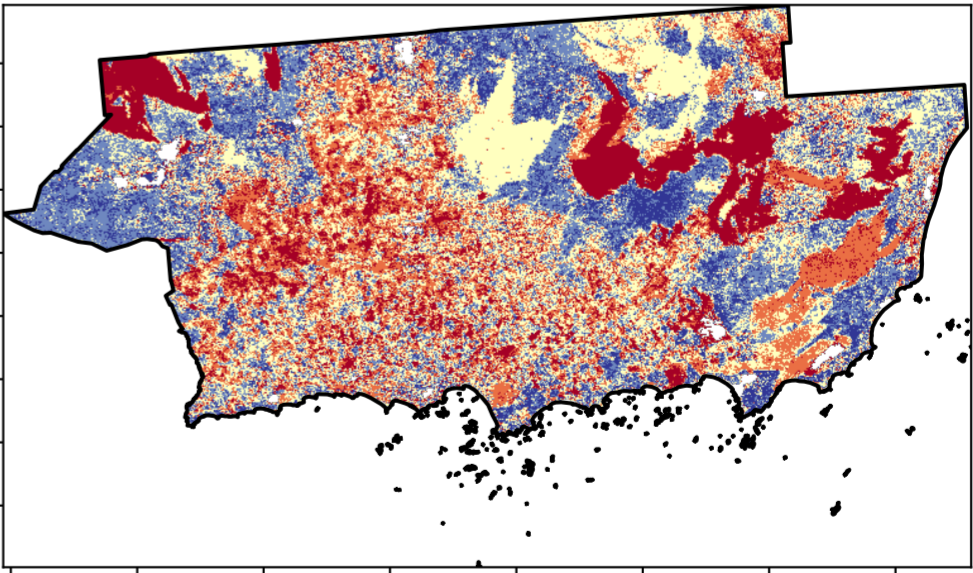
Area protected 96.0% of region (4,225,200 ha)

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.
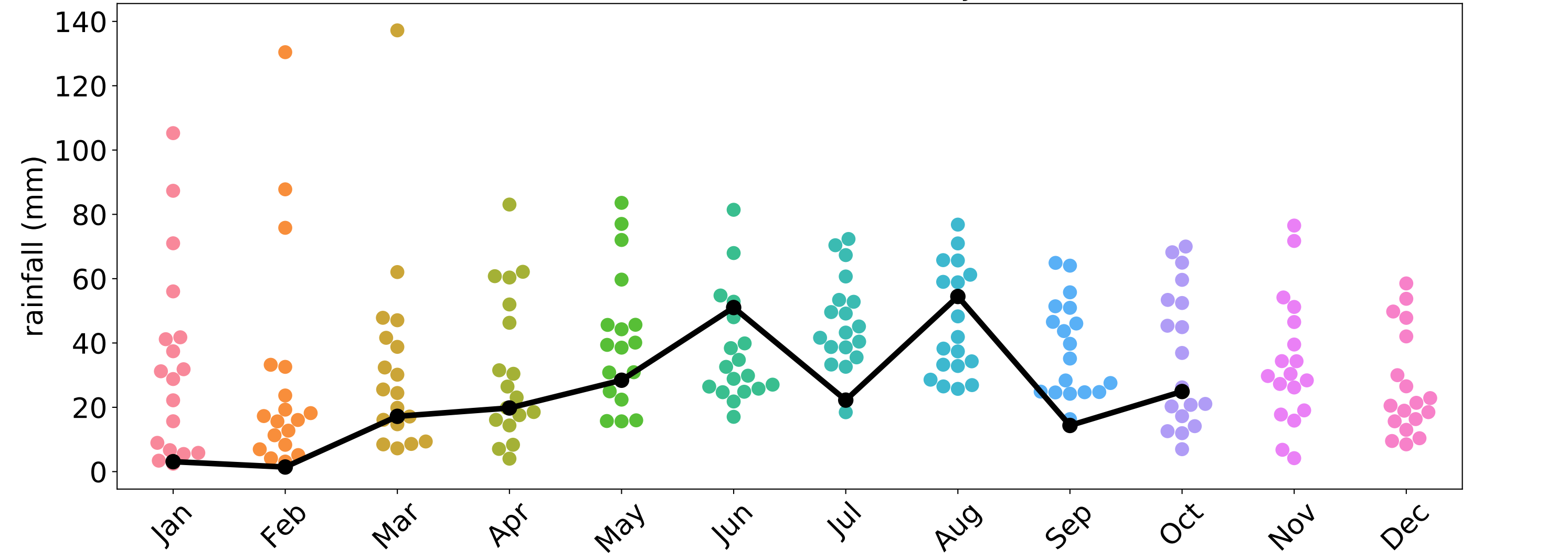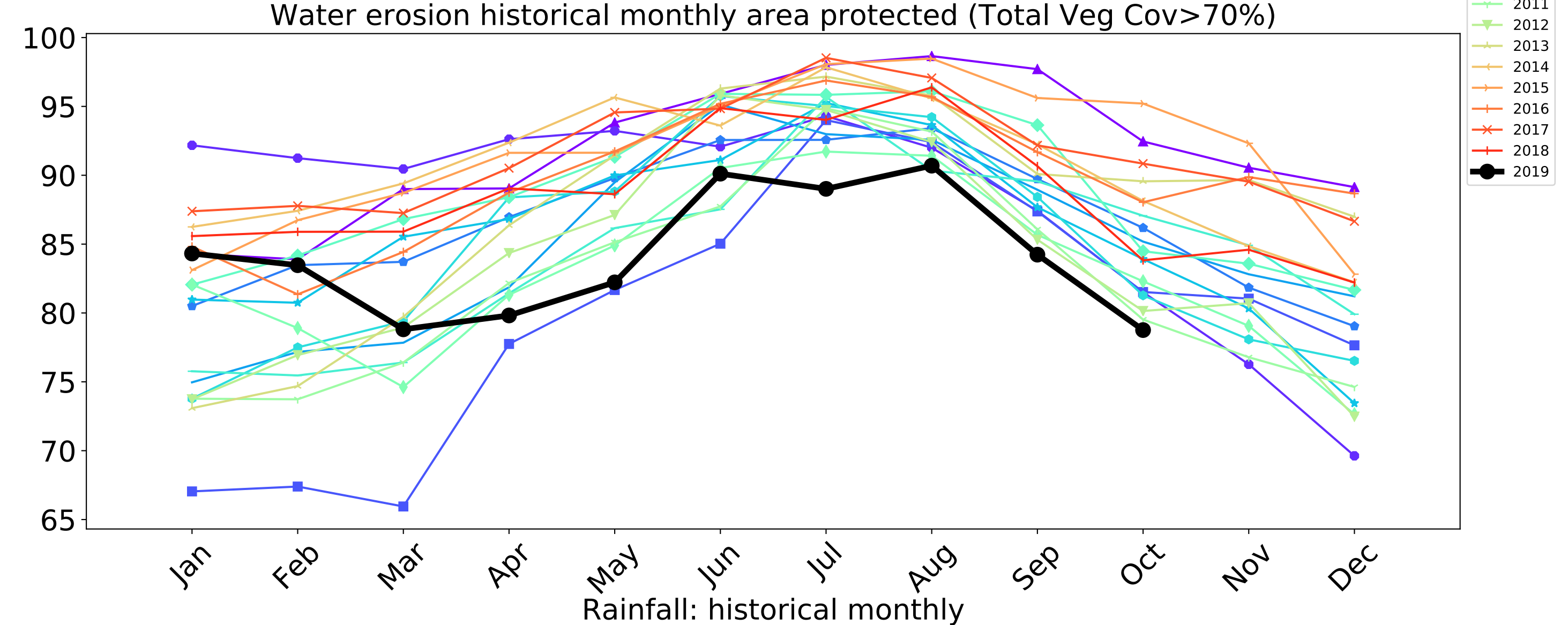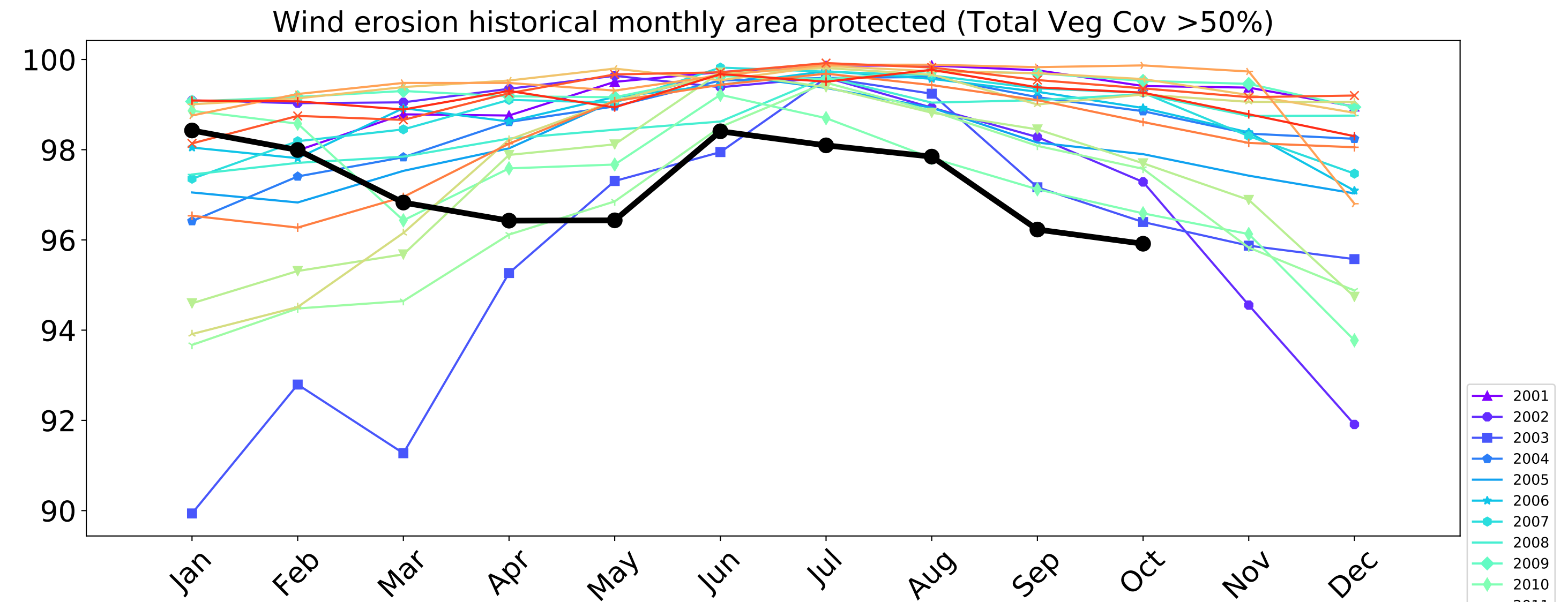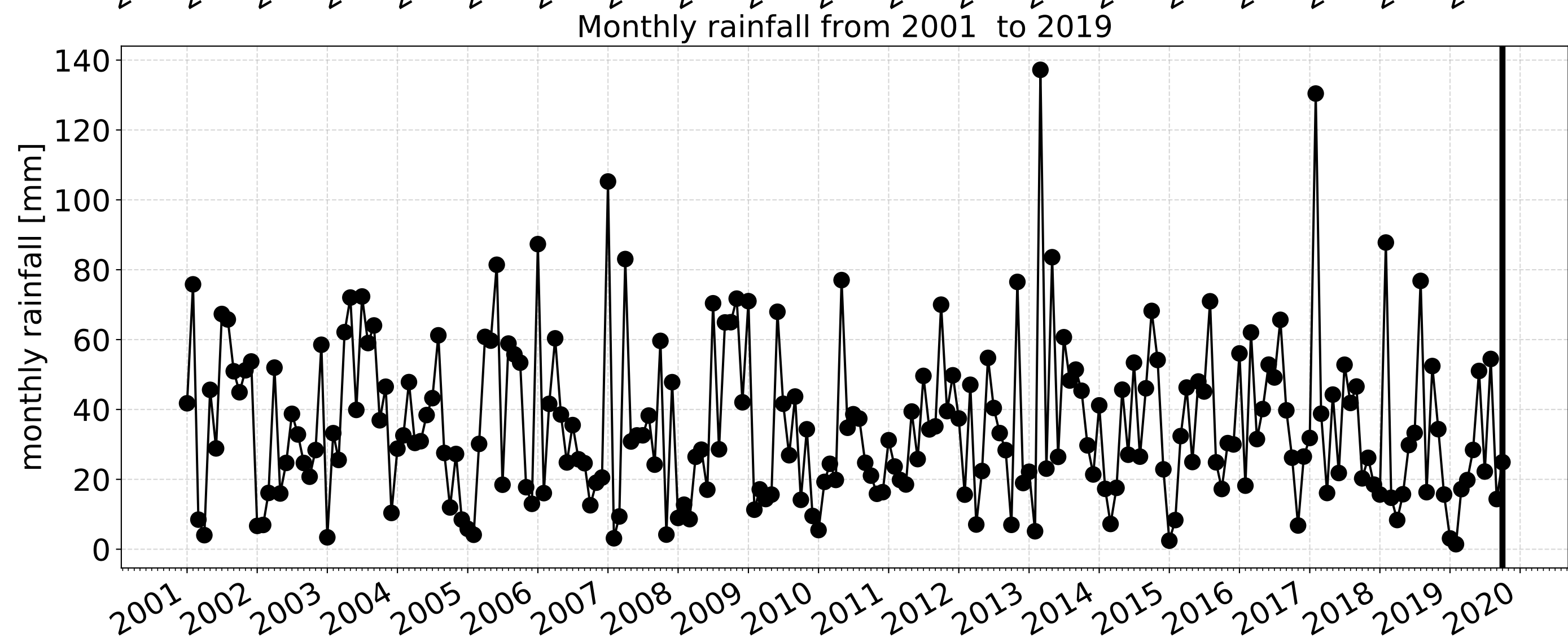
10
8-9
4-7
2-3
1

CSIRO   TERN   Australian Government | National Landcare Programme   NSW GOVERNMENT | Planning, Industry & Environment

2

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%)

Monthly rainfall from 2001 to 2019

Rainfall: historical monthly

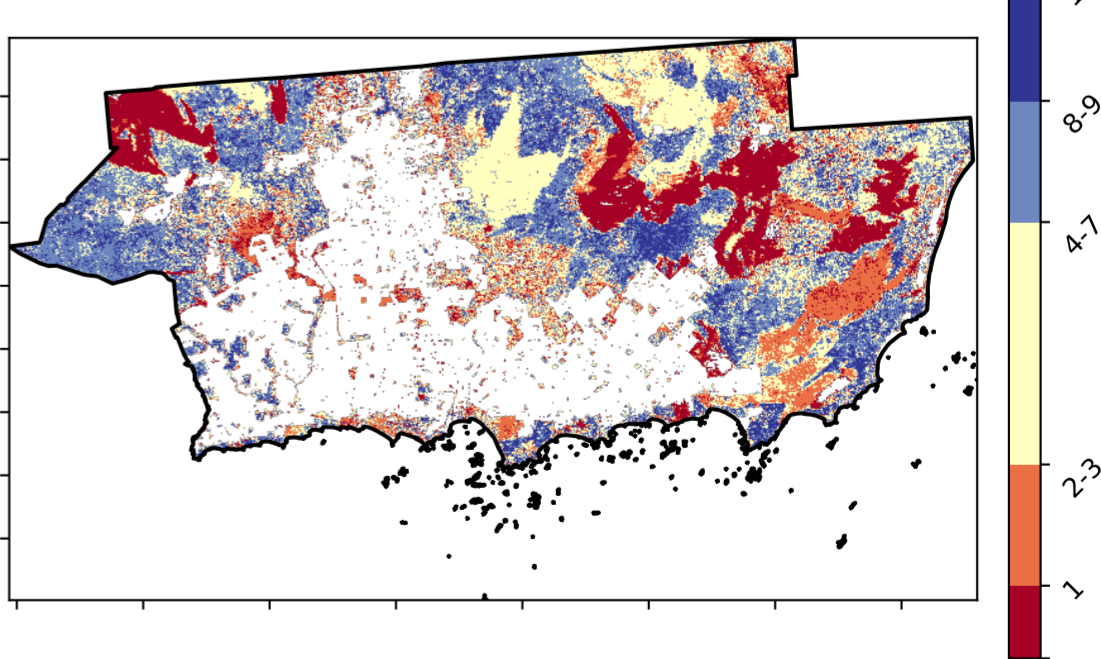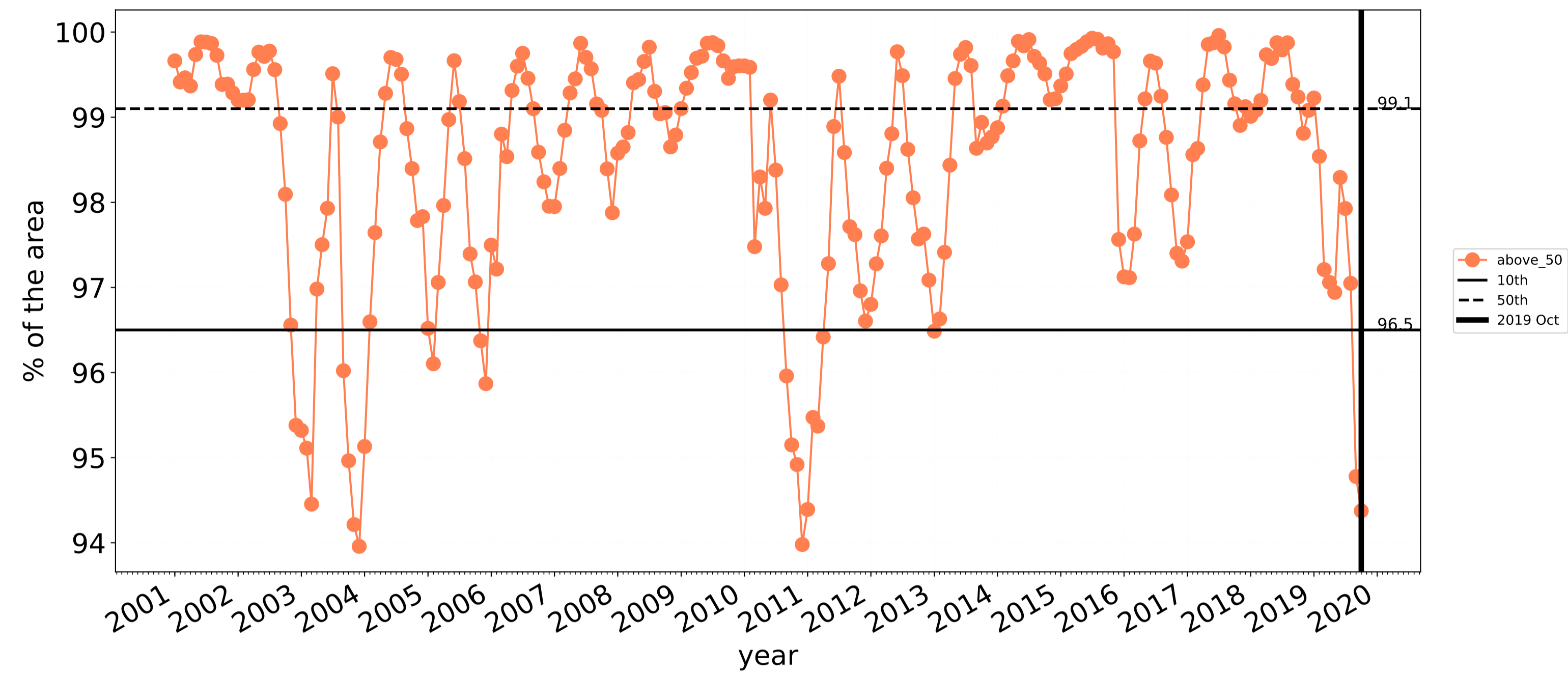# Conservation and natural environments

Land use and forest cover

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

- Conservation and natural environments - Non-forest
- Conservation and natural environments – Woodland forest
- Conservation and natural environments – Non-woodland forest

Total Vegetation Cover [%]

71%-100%

51%-70%

31%-50%

0-30%

Proportion of vegetation cover class in area

Area (%)

1.5% 4.2% 11.7% 82.6%

0-30%   31%-50%   51%-70%   71%-100%

Total Vegetation Cover class

% Area protected from water erosion (>70%)

Area not protected 17.4% of region (525,697 ha)

Area protected 82.6% of region (2,495,552 ha)

% Area protected from wind erosion (>50%)

Area not protected 6.0% of region (181,275 ha)

Area protected 94.0% of region (2,839,975 ha)

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.
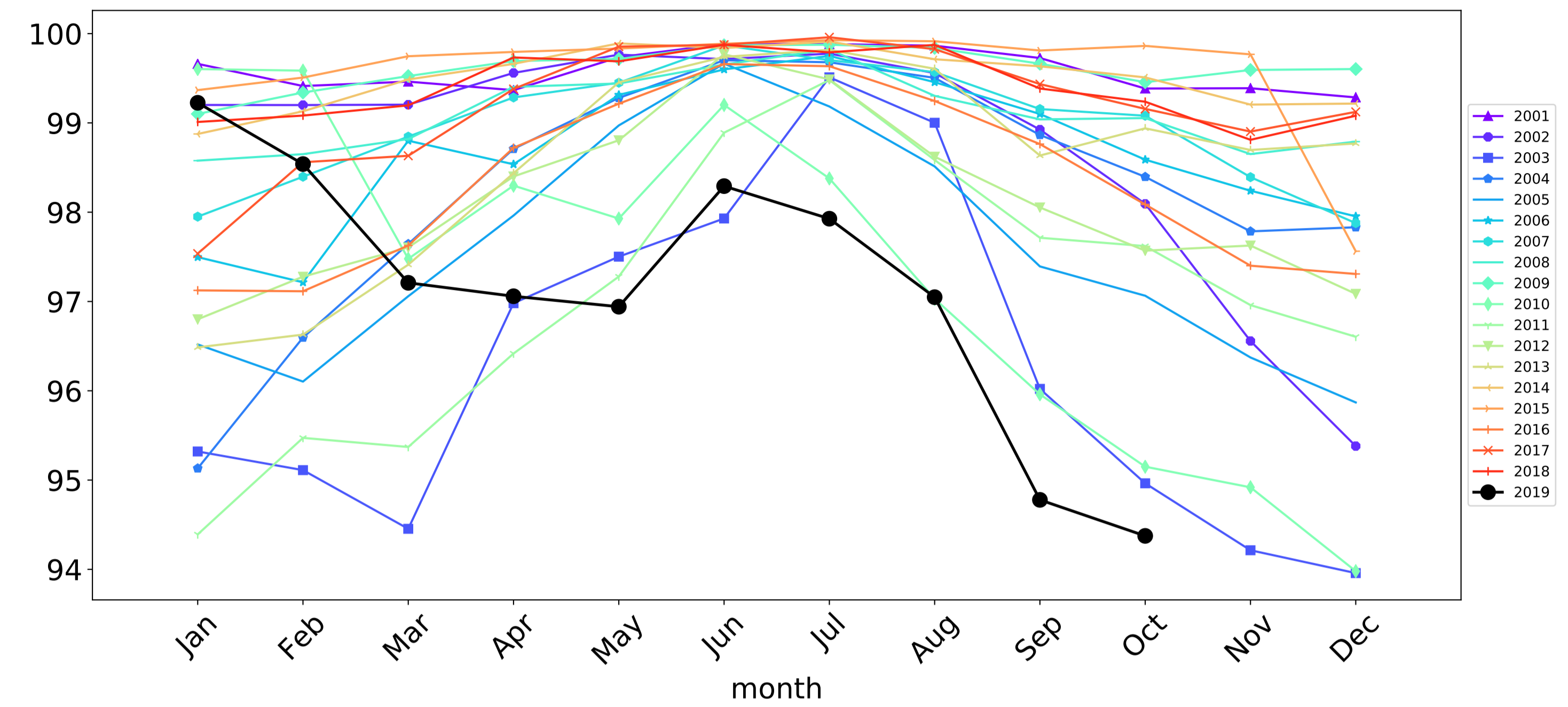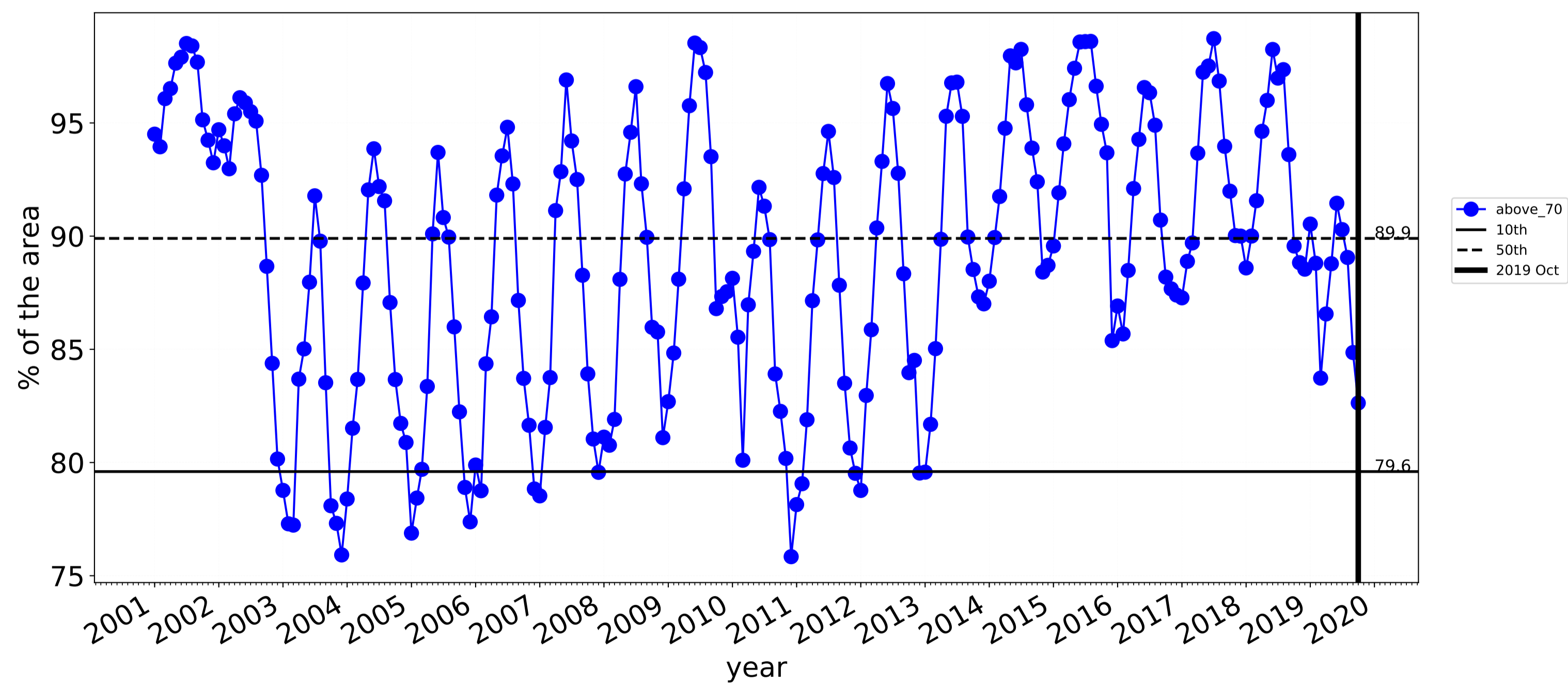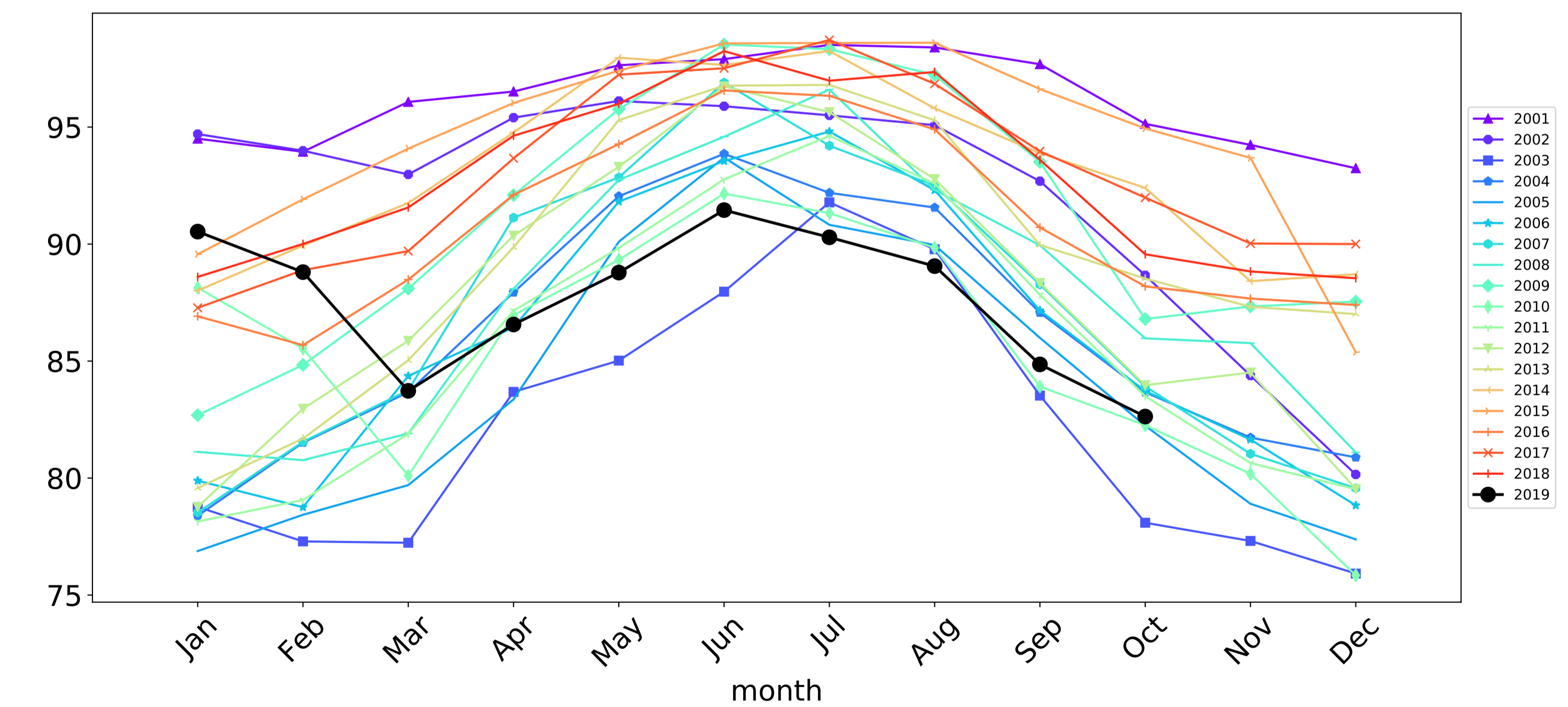
10

8-9

4-7

2-3

1

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%)
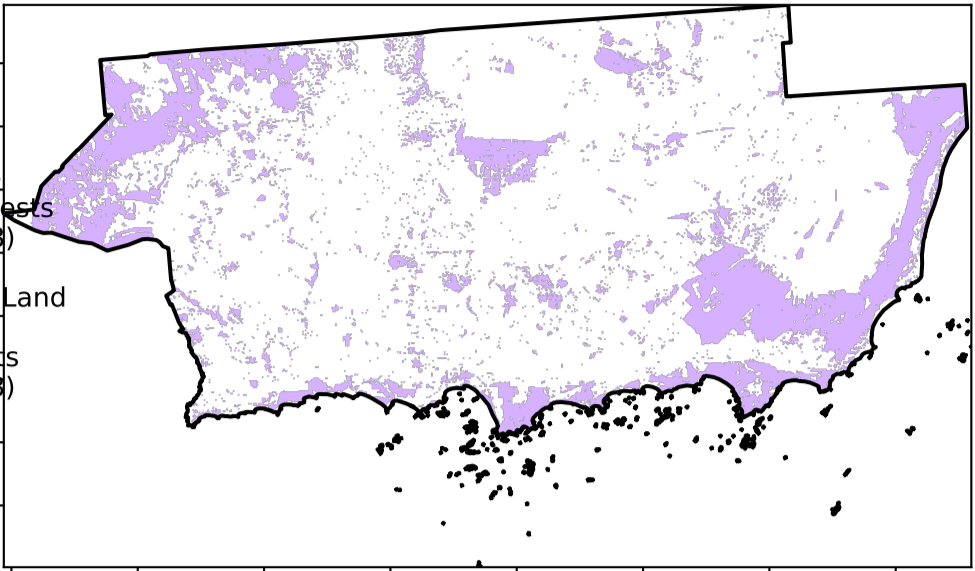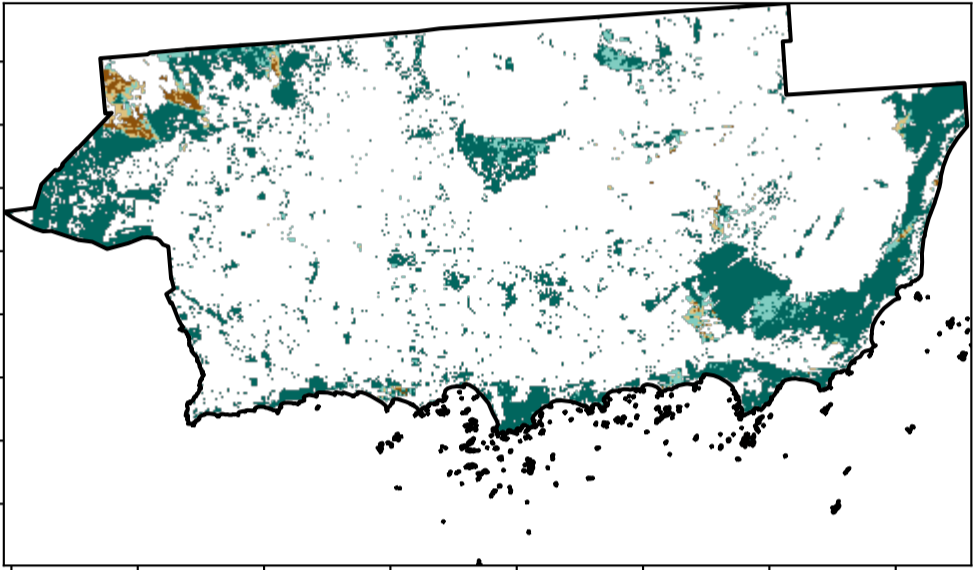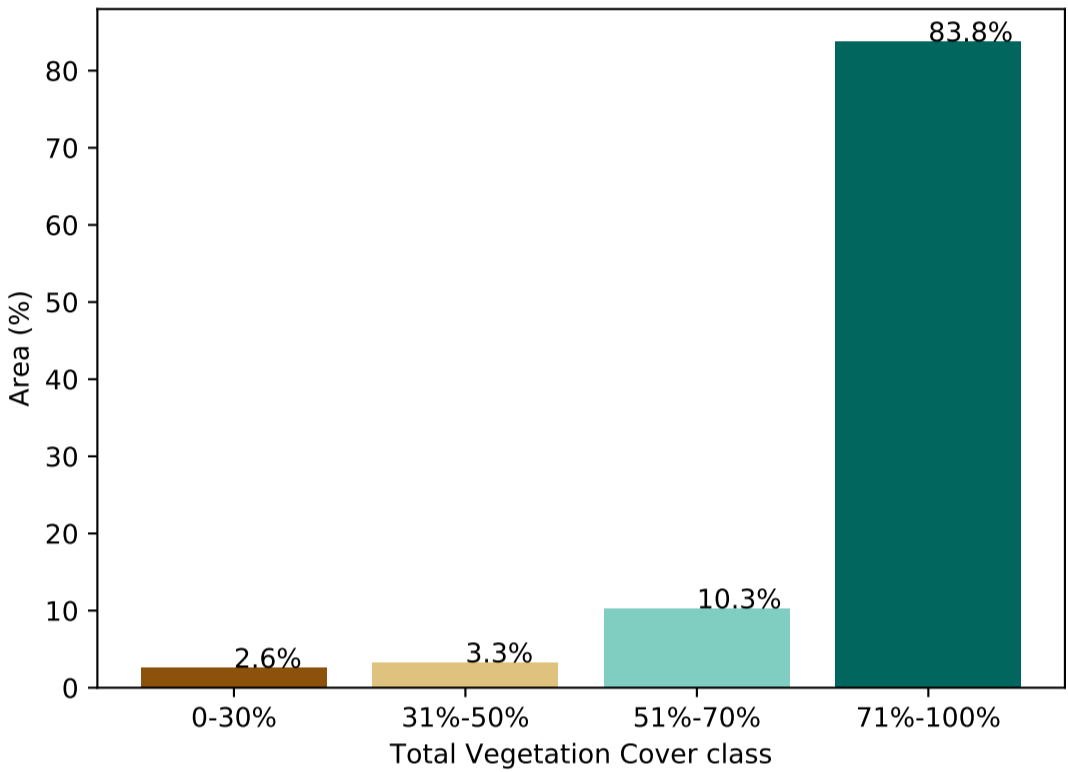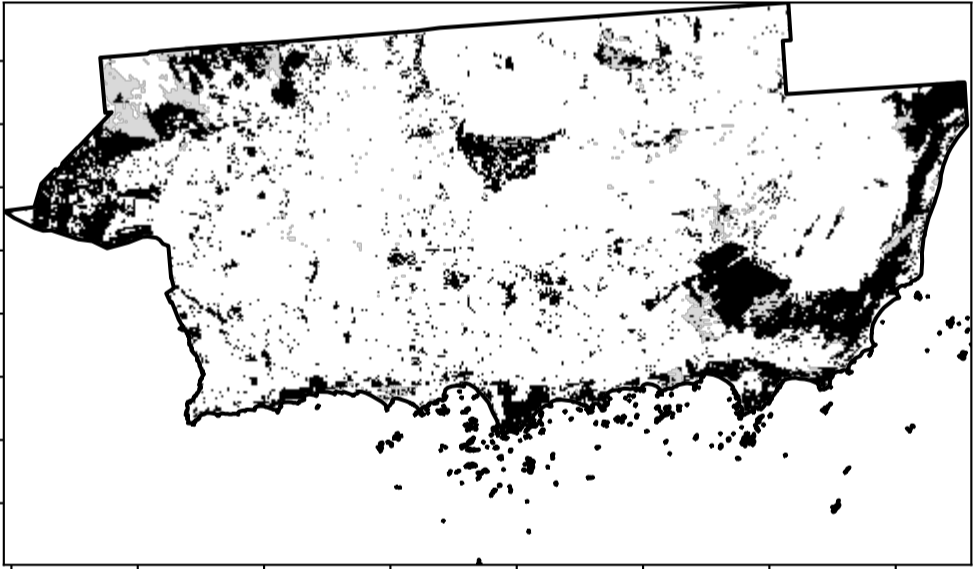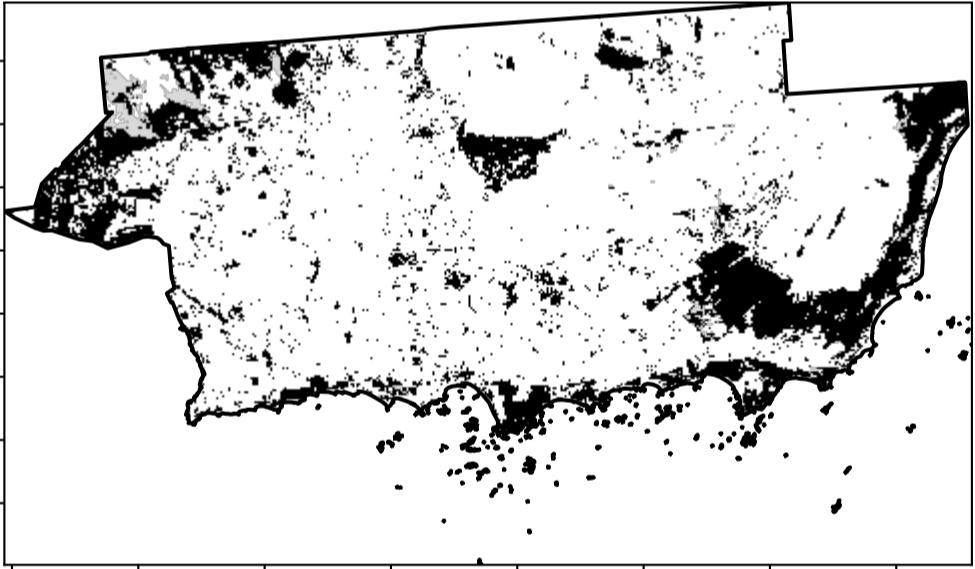

Water erosion historical monthly area protected (Total Veg Cov>70%)

Conservation and natural environments non forest

Land use and forest cover

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

Conservation and natural environments - Non-forest

Total Vegetation Cover [%]

71%-100%

51%-70%

31%-50%

0-30%

Proportion of vegetation cover class in area

83.8%

2.6%   3.3%   10.3%

0-30%   31%-50%   51%-70%   71%-100%

Total Vegetation Cover class

Area (%)

% Area protected from water erosion (>70%)

Area not
protected
16.2% of
region
(147,379
ha)

Area
protected
83.8% of
region
(762,370
ha)

% Area protected from wind erosion (>50%)

Area not
protected
6.0% of
region
(54,585
ha)

Area
protected
94.0% of
region
(855,165
ha)

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.

20

10

0

−10

−20

Total Vegetation Cover Decile [%]

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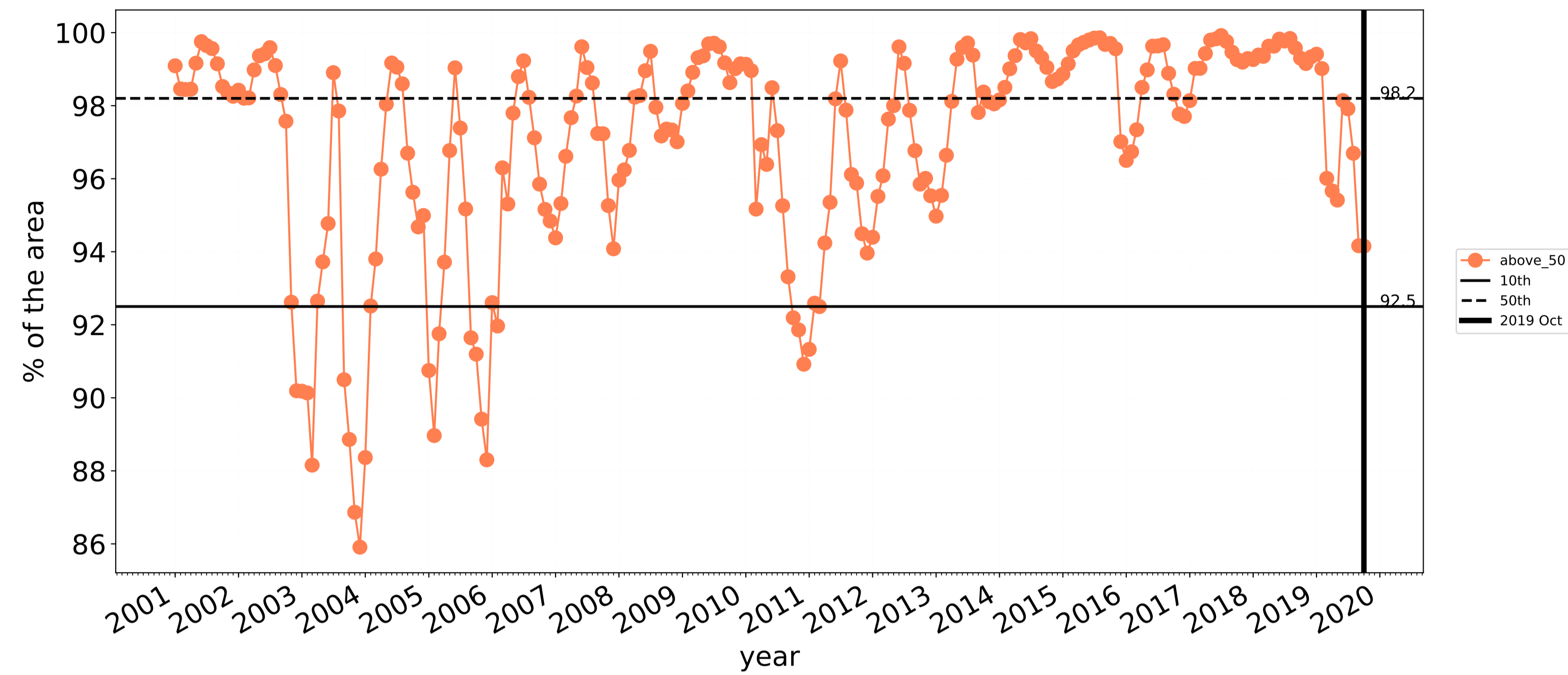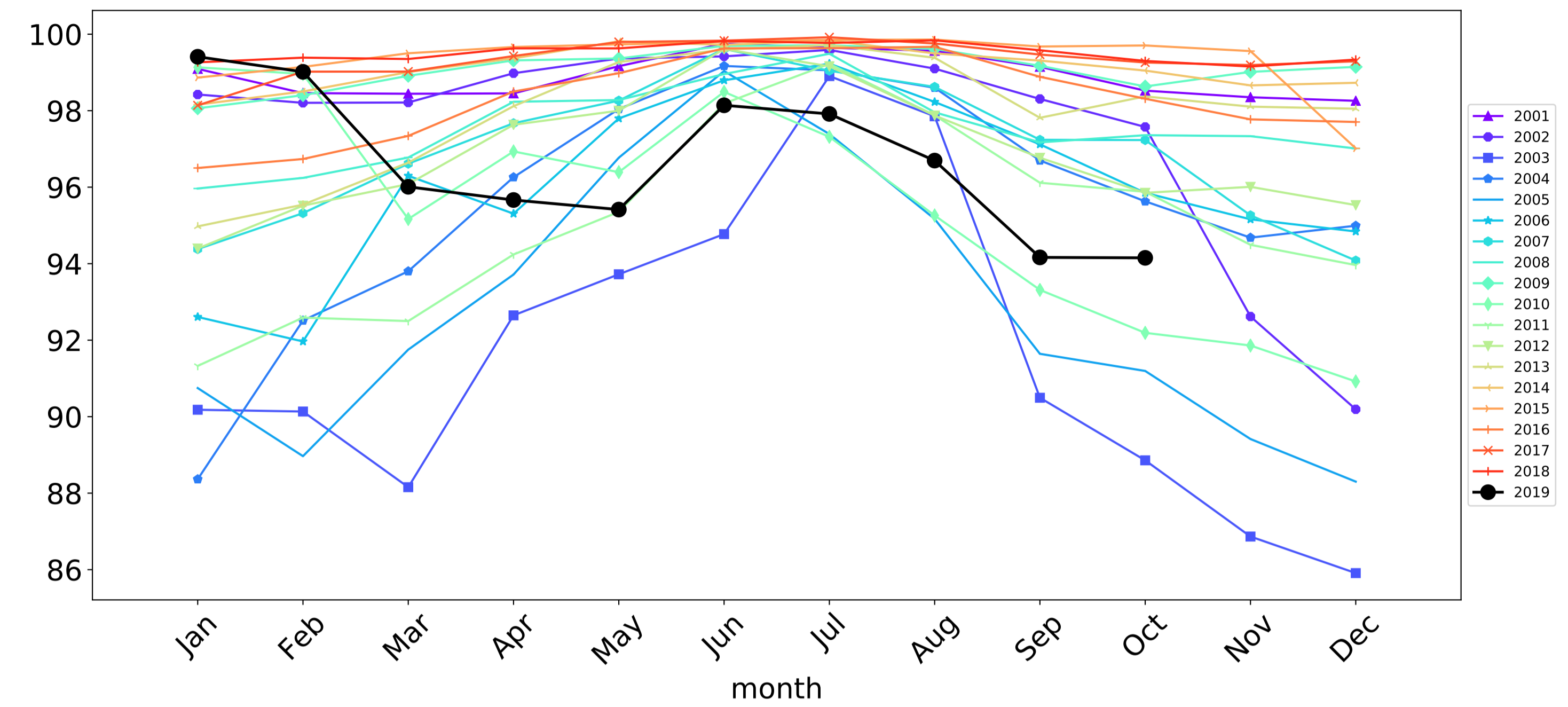records for that month
of the map using baseline
from 2001 to 2019.

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8-9

4-7

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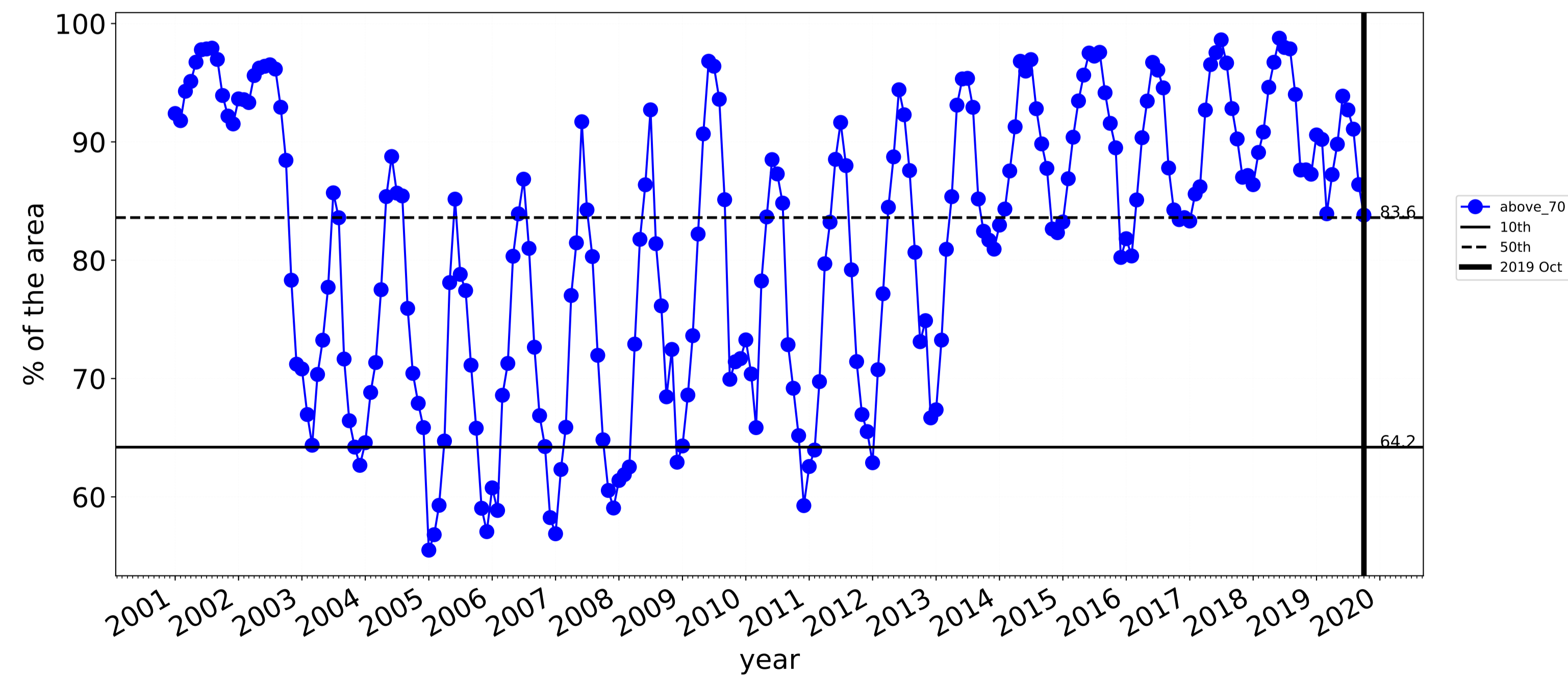# Conservation and natural environments non forest timeseries

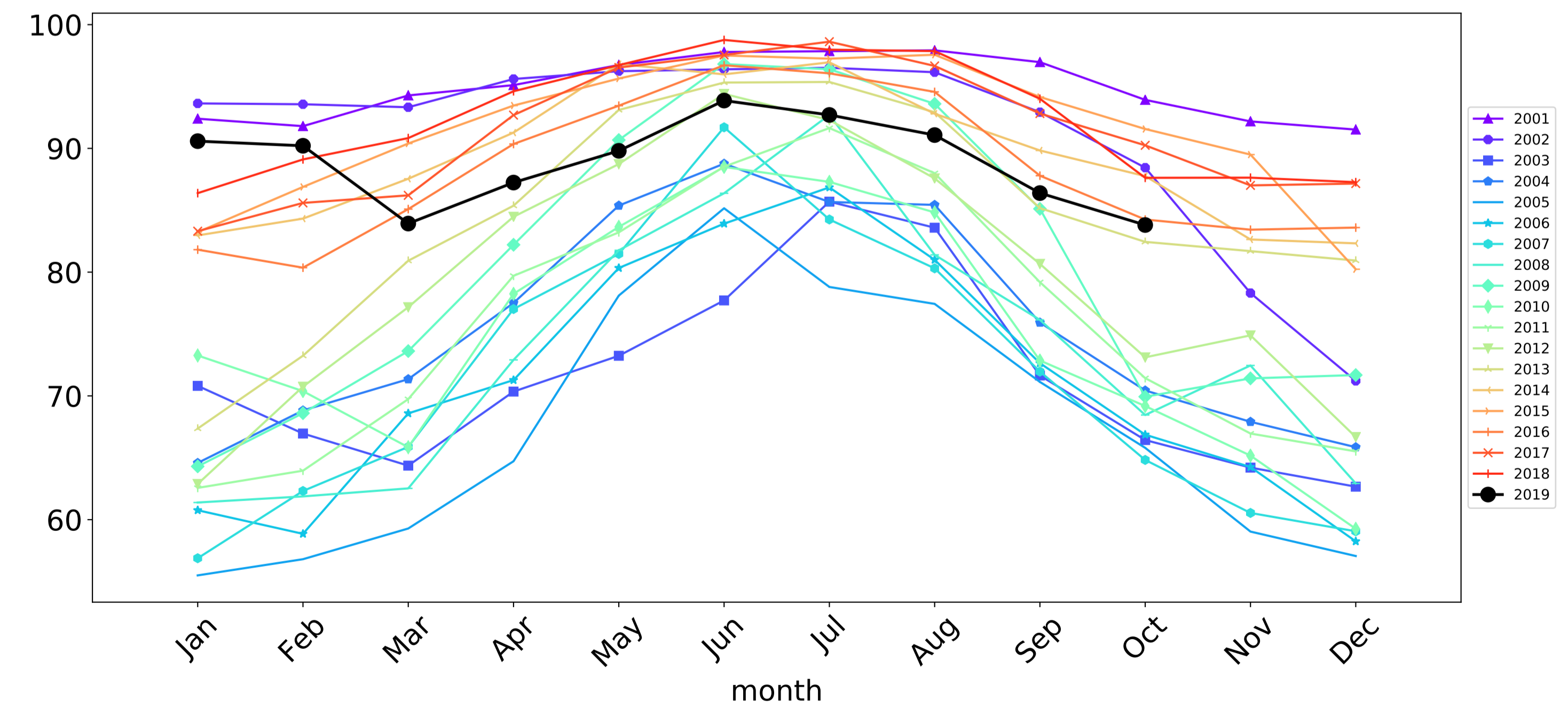Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

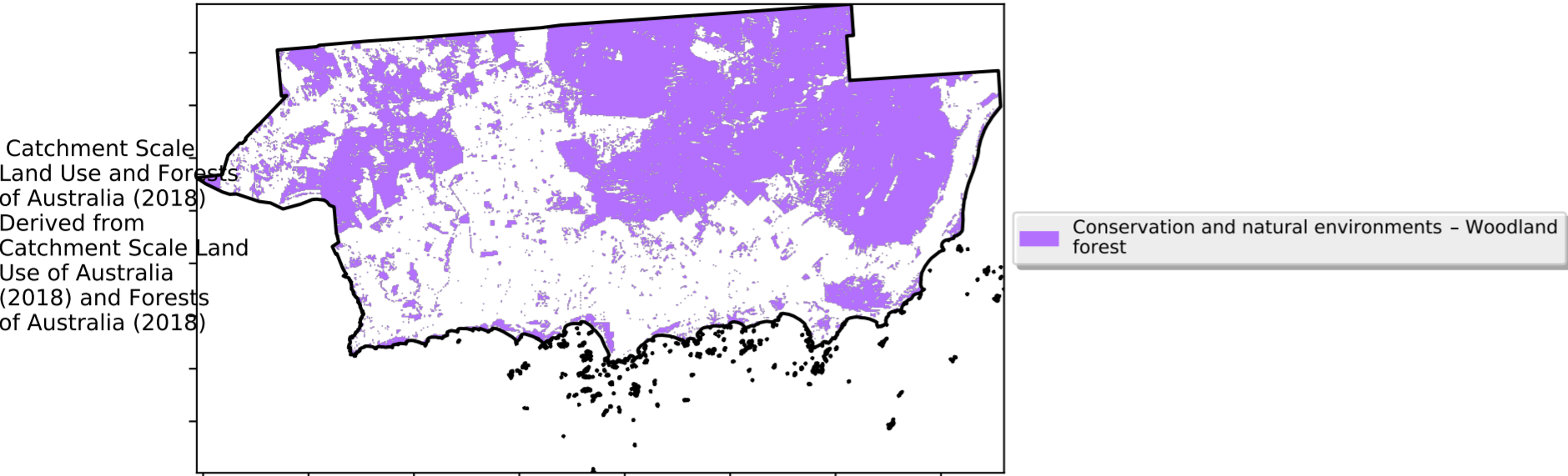Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

Water erosion historical monthly area protected (Total Veg Cov>70%)
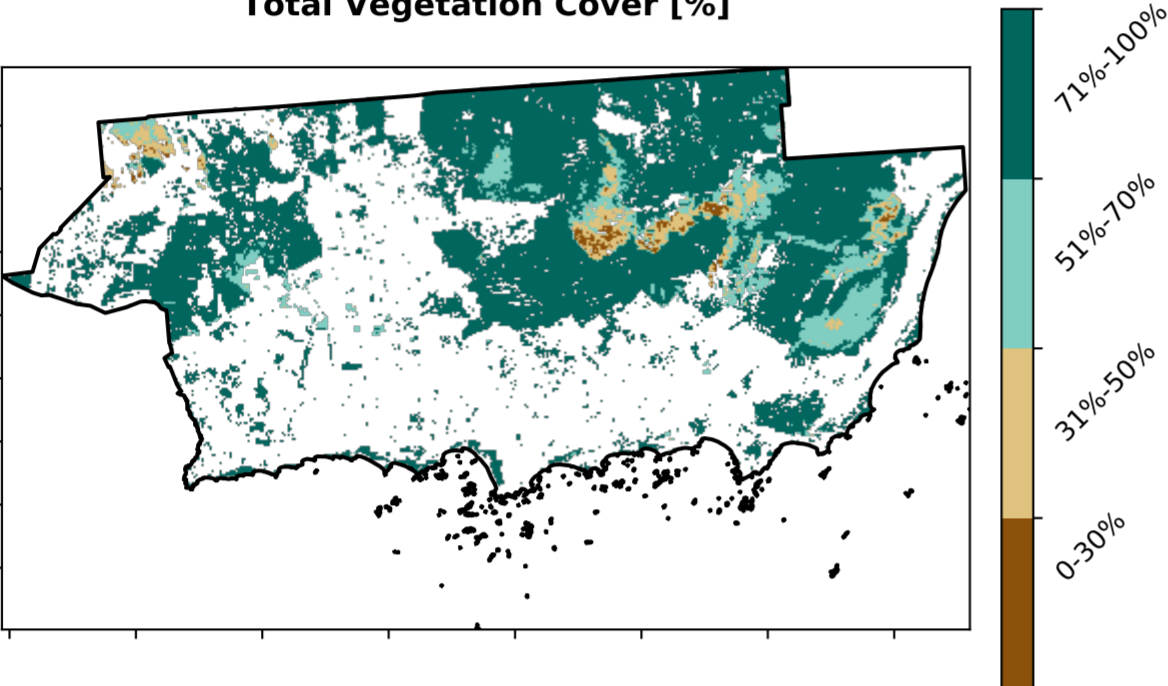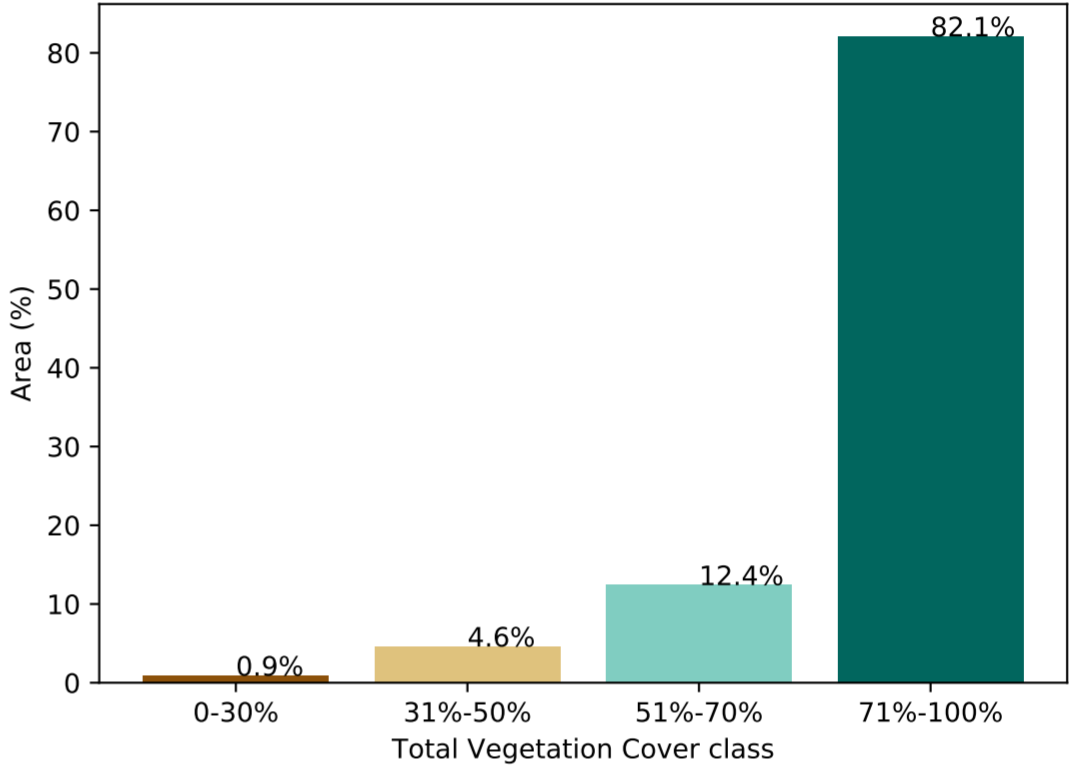
Conservation and natural environments Woodland forest
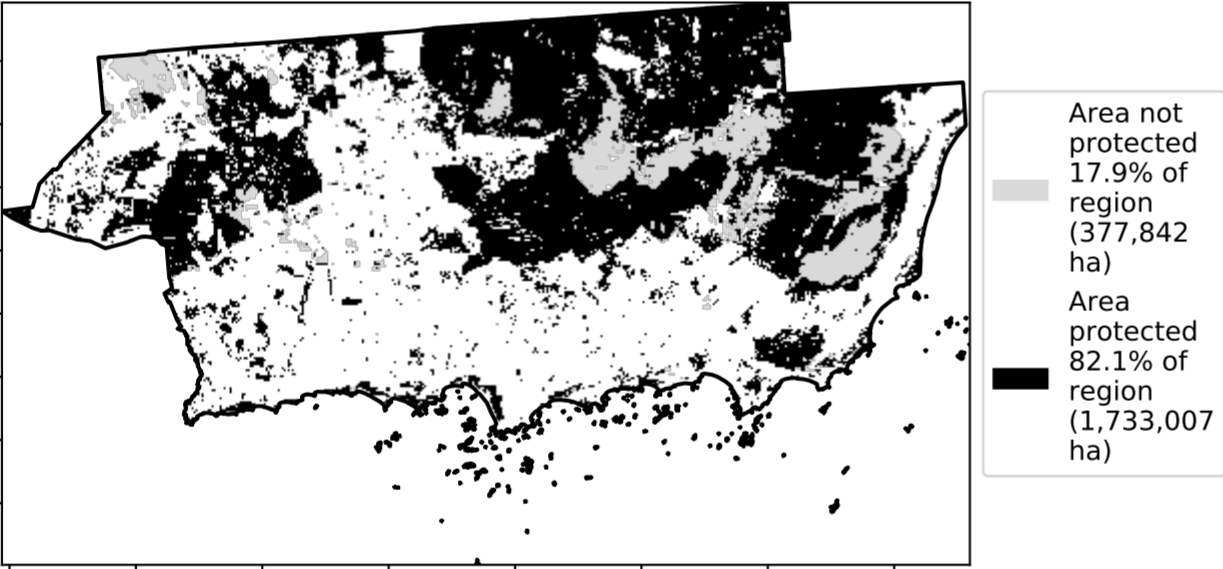
Land use and forest cover

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

Conservation and natural environments – Woodland forest

Total Vegetation Cover [%]

71%-100%

51%-70%

31%-50%

0-30%

Proportion of vegetation cover class in area

82.1%

12.4%

4.6%

0.9%

Area (%)

Total Vegetation Cover class

0-30%   31%-50%   51%-70%   71%-100%

% Area protected from water erosion (>70%)

Area not
protected
17.9% of
region
(377,842
ha)

Area
protected
82.1% of
region
(1,733,007
ha)

% Area protected from wind erosion (>50%)

Area not
protected
6.0% of
region
(126,651
ha)

Area
protected
94.0% of
region
(1,984,199
ha)

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.

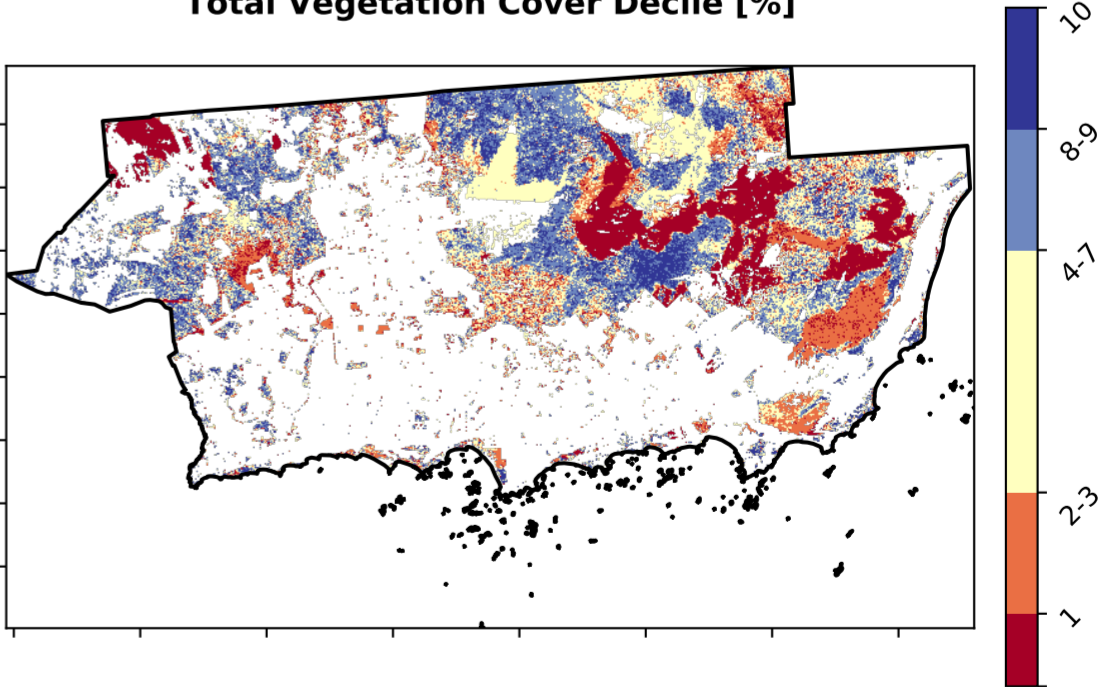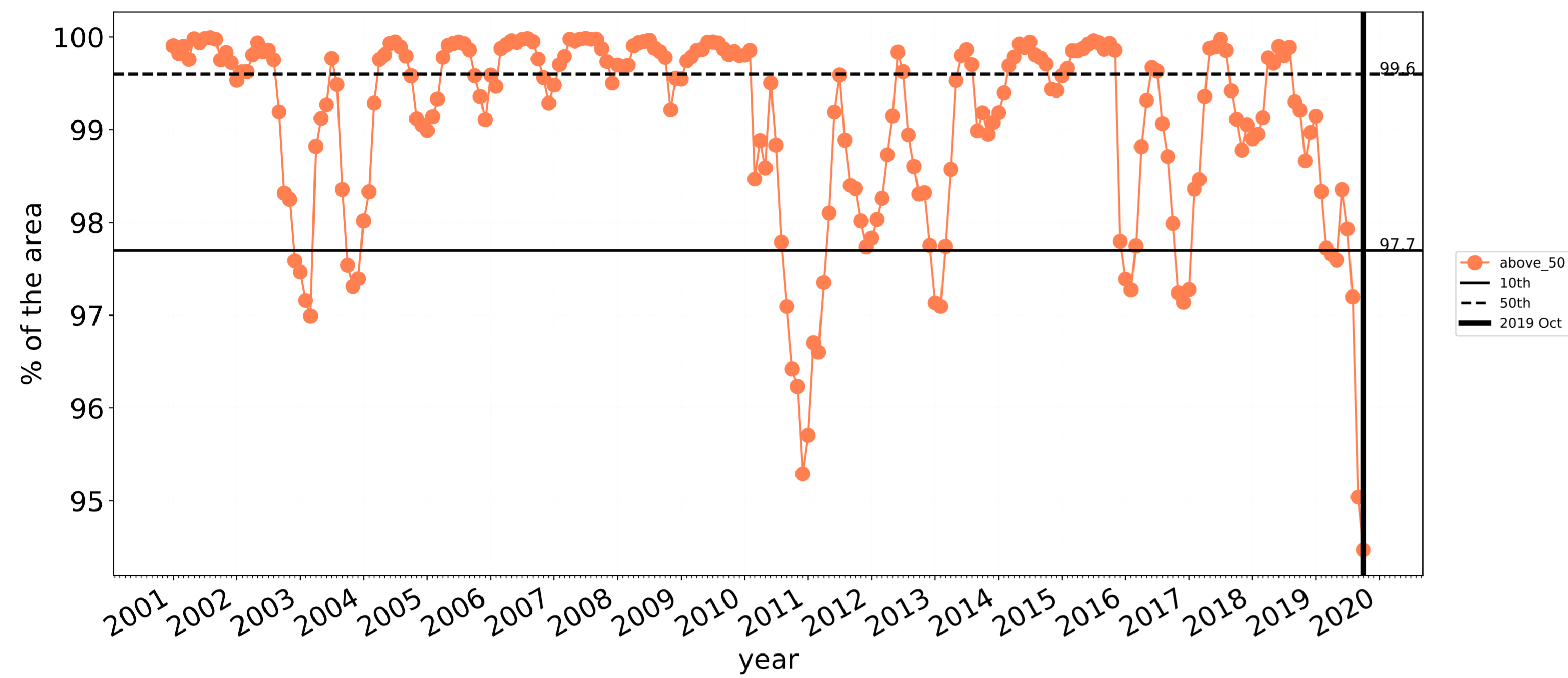**Total Vegetation Cover Decile [%]**

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
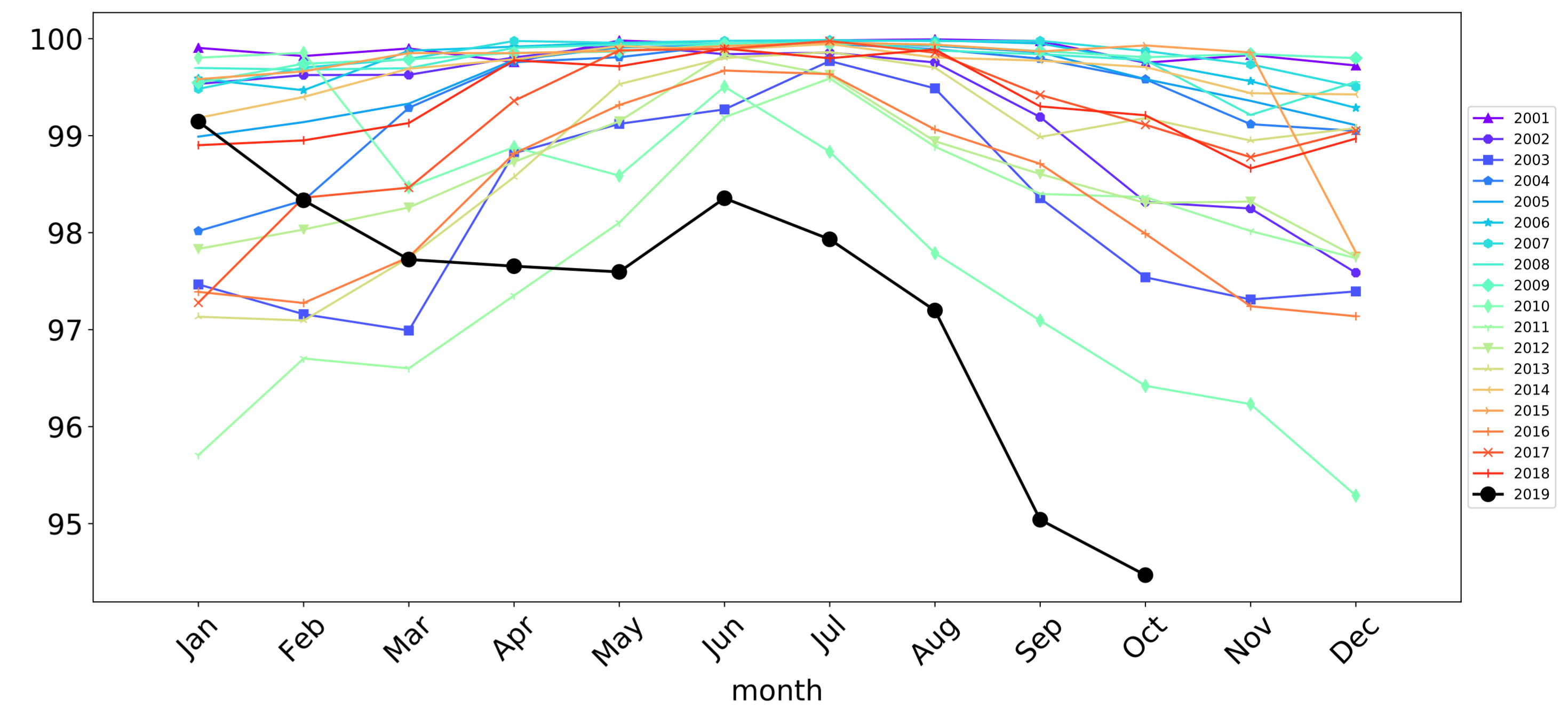the map using baseline
from 2001 to 2019.

10

8-9

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CSIRO

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Australian Government

National
Landcare
Programme

NSW
GOVERNMENT

Planning,
Industry &
Environment
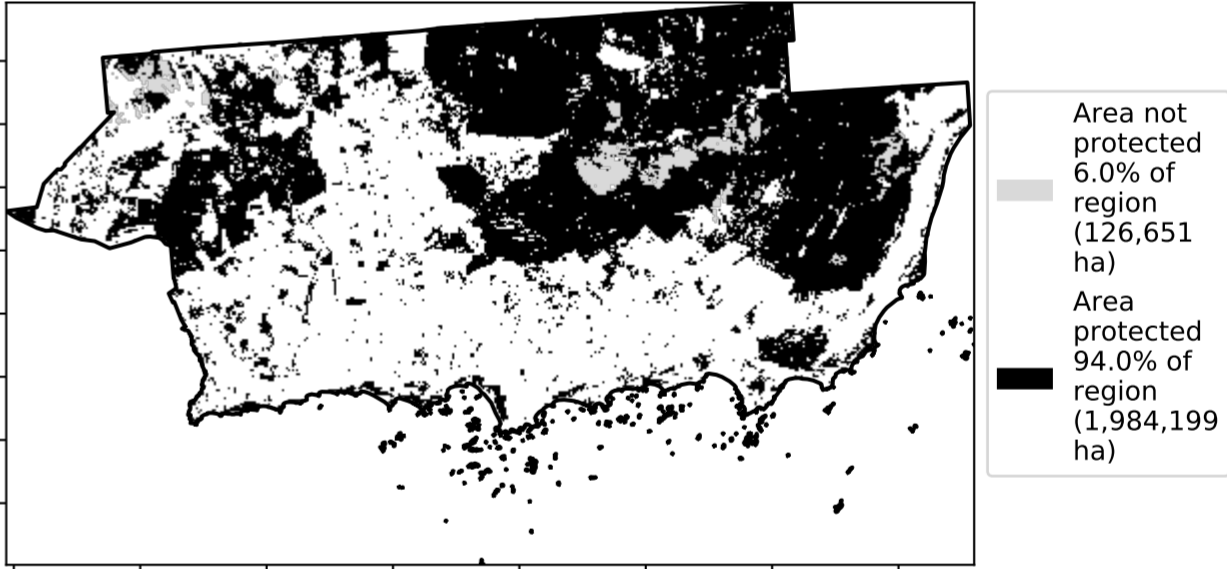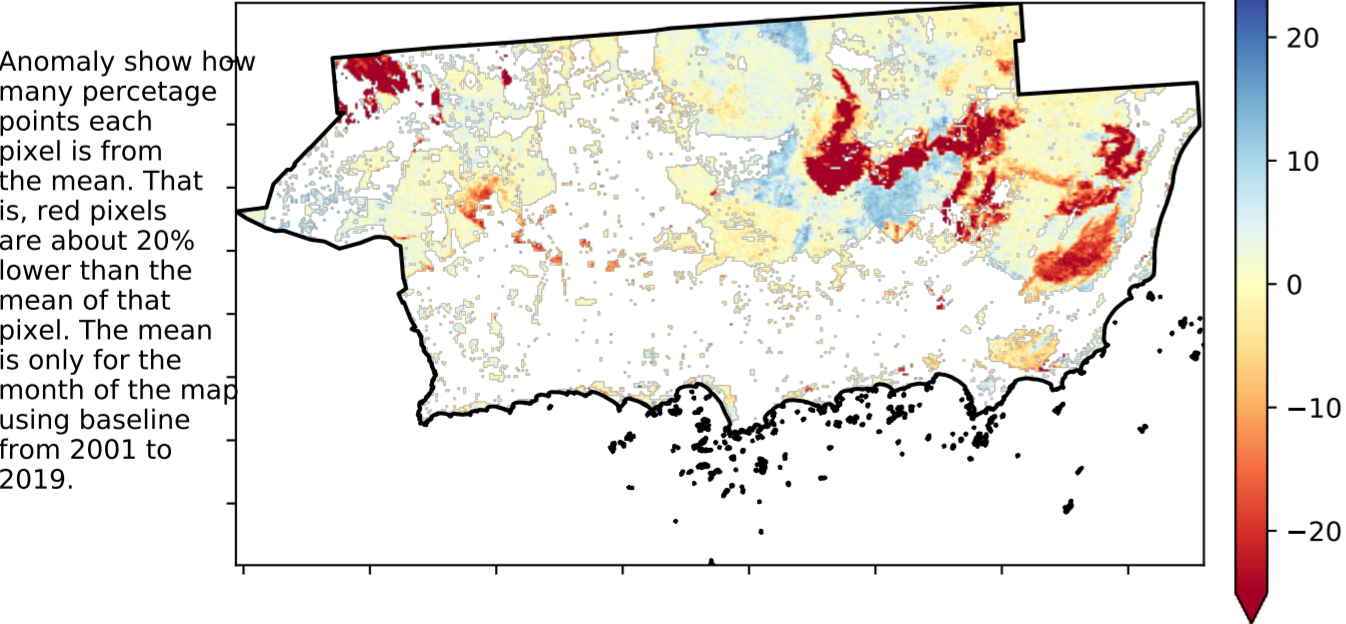
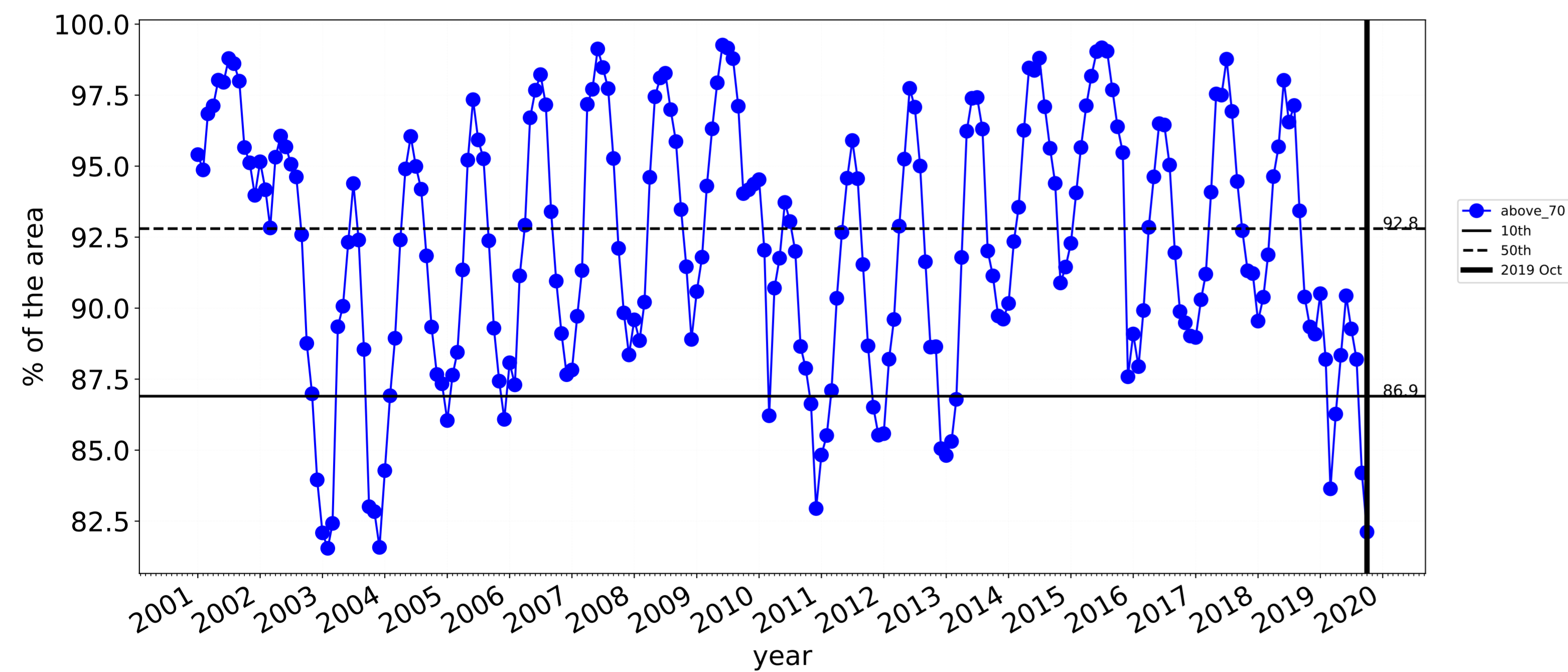# Conservation and natural environments Woodland forest timeseries

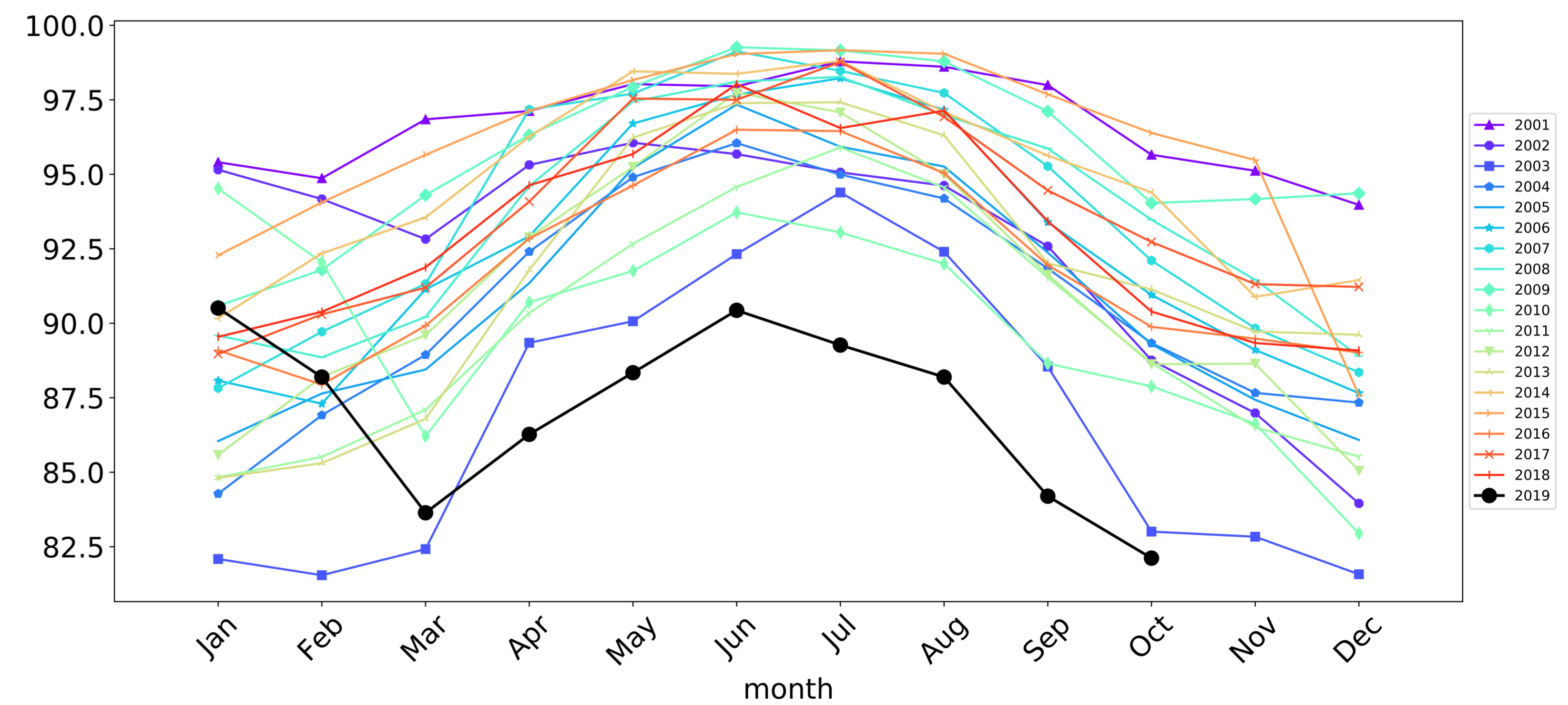### Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

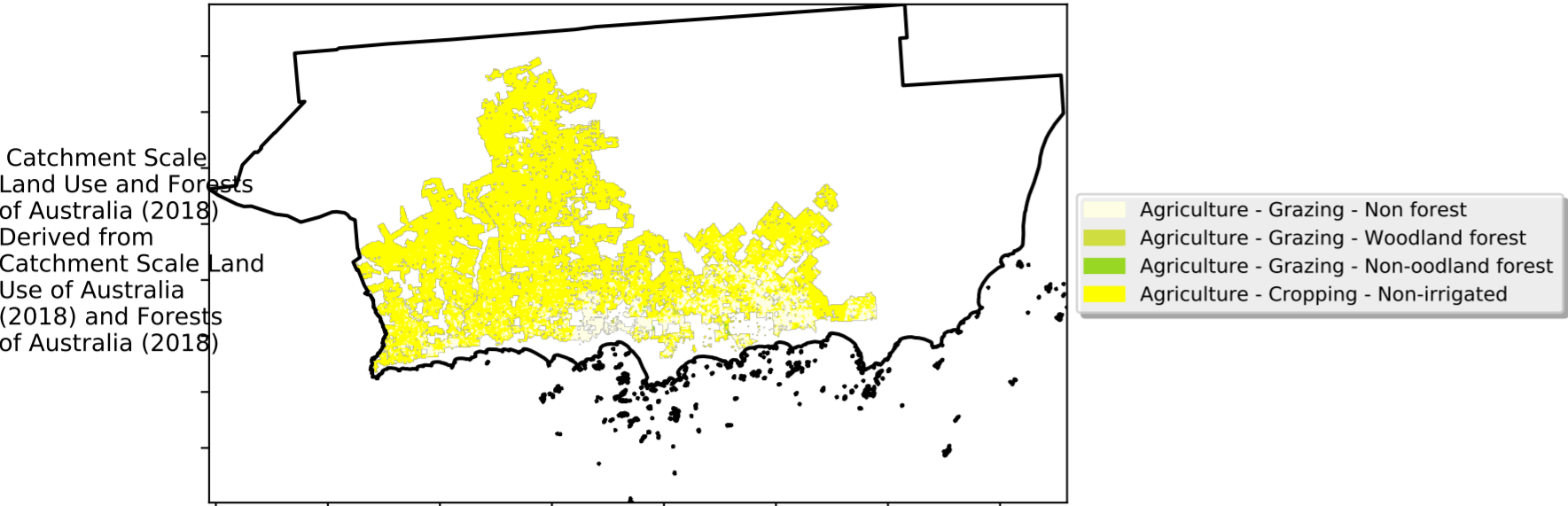### Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

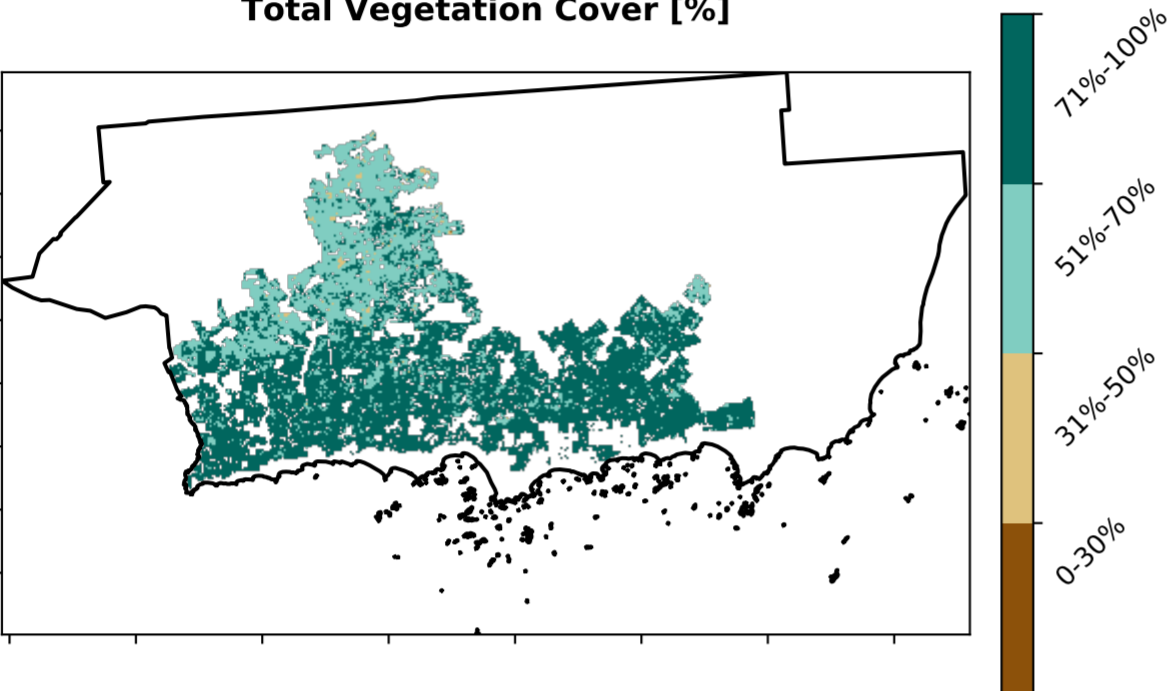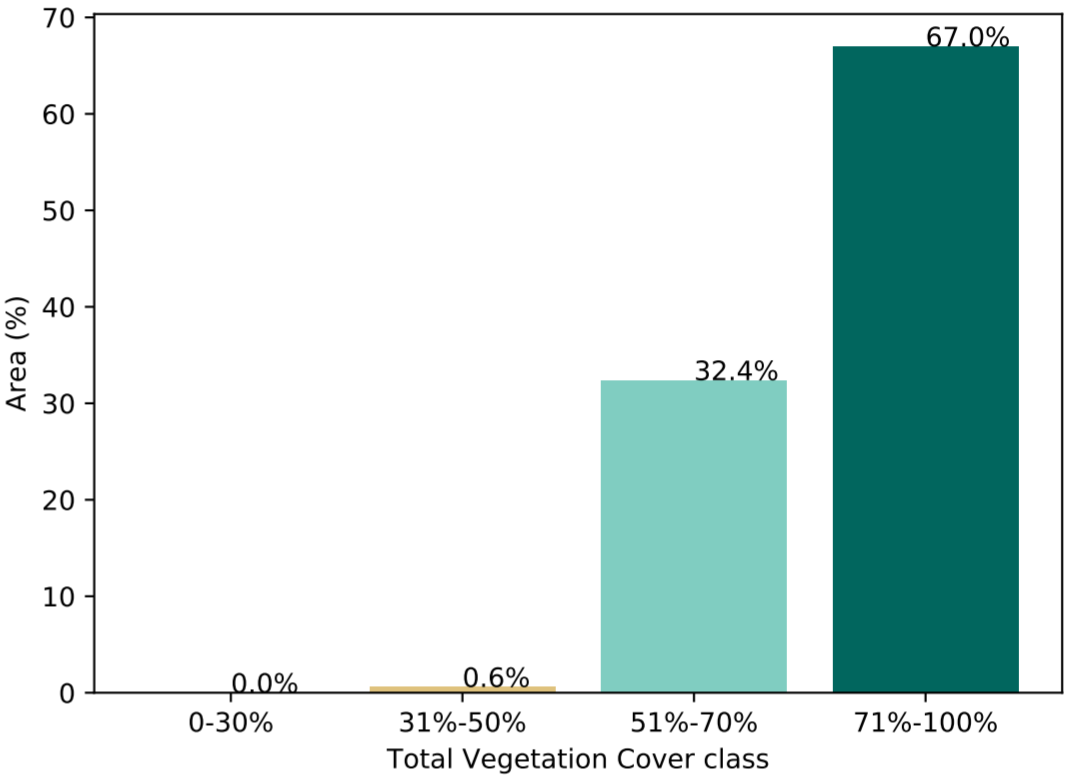### Water erosion historical monthly area protected (Total Veg Cov>70%)

Agriculture

Land use and forest cover

Legend:
- Agriculture - Grazing - Non forest
- Agriculture - Grazing - Woodland forest
- Agriculture - Grazing - Non-oodland forest
- Agriculture - Cropping - Non-irrigated

Total Vegetation Cover [%]

- 71%-100%
- 51%-70%
- 31%-50%
- 0-30%

Proportion of vegetation cover class in area

Area (%) vs Total Vegetation Cover class

- 0-30%: 0.0%
- 31%-50%: 0.6%
- 51%-70%: 32.4%
- 71%-100%: 67.0%

% Area protected from water erosion (>70%)

Area not protected 33.0% of region (393,244 ha)

Area protected 67.0% of region (798,405 ha)

% Area protected from wind erosion (>50%)

Area not protected 1.0% of region (11,916 ha)

Area protected 99.0% of region (1,179,733 ha)

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.
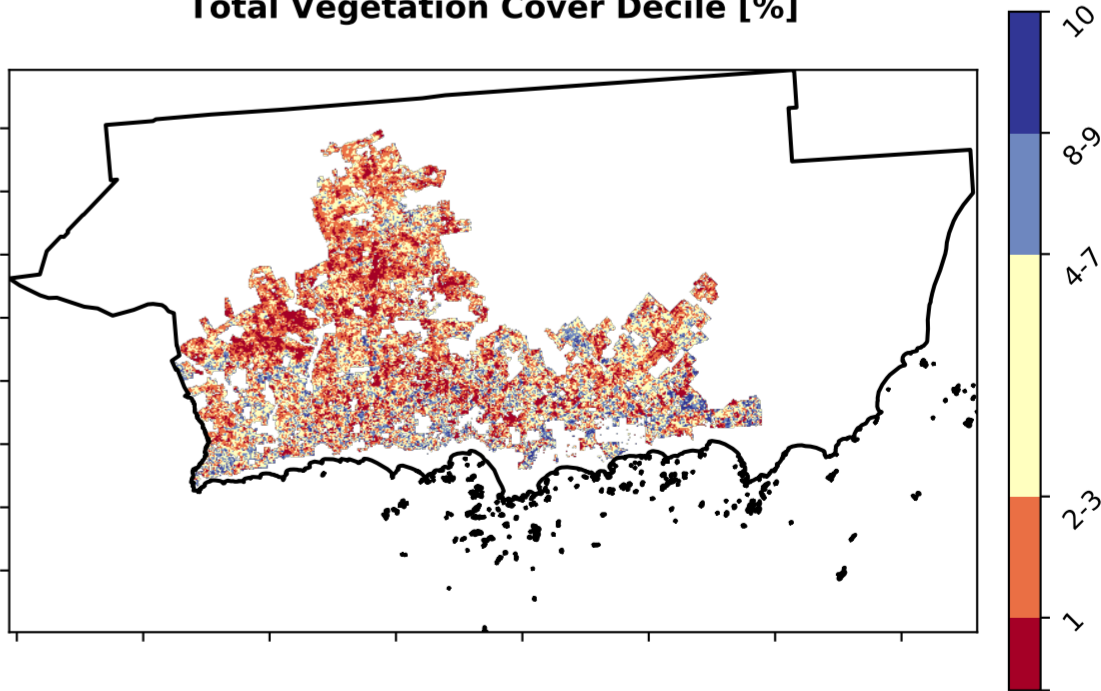
Total Vegetation Cover Decile [%]

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.
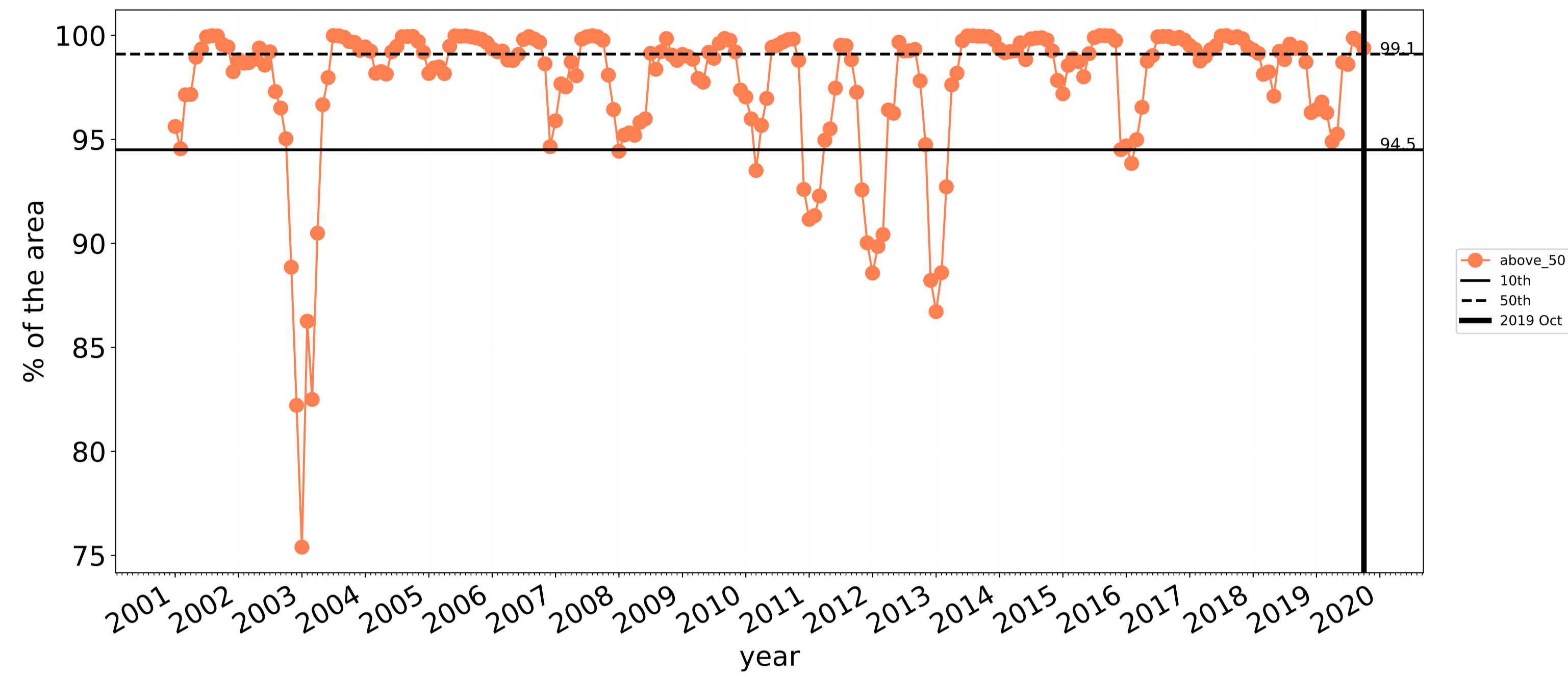
- 10
- 8-9
- 4-7
- 2-3
- 1
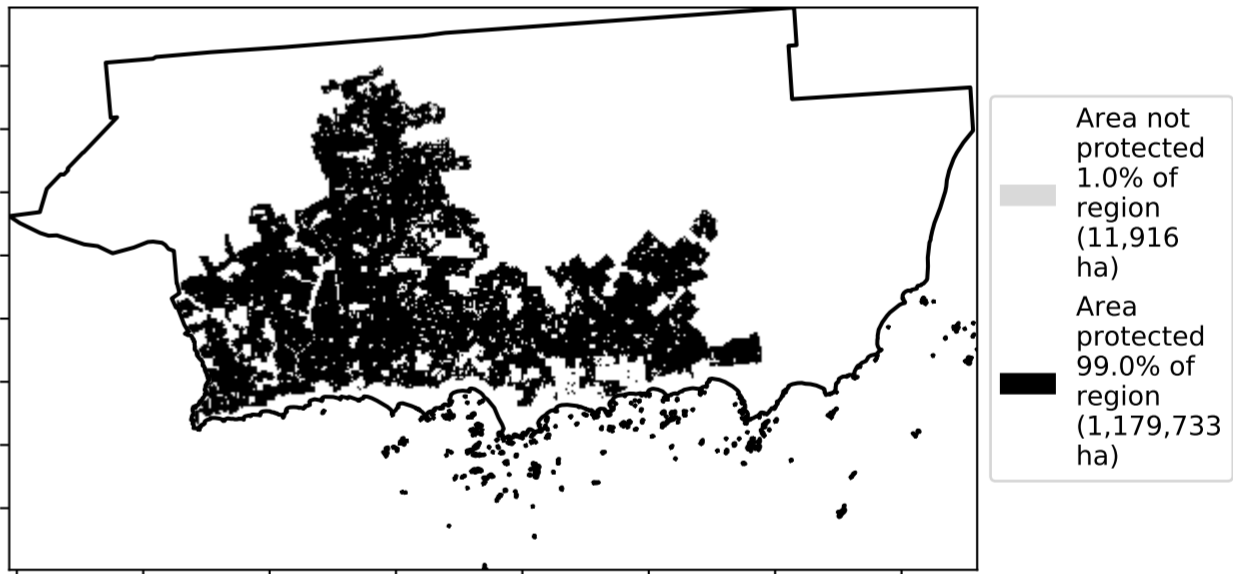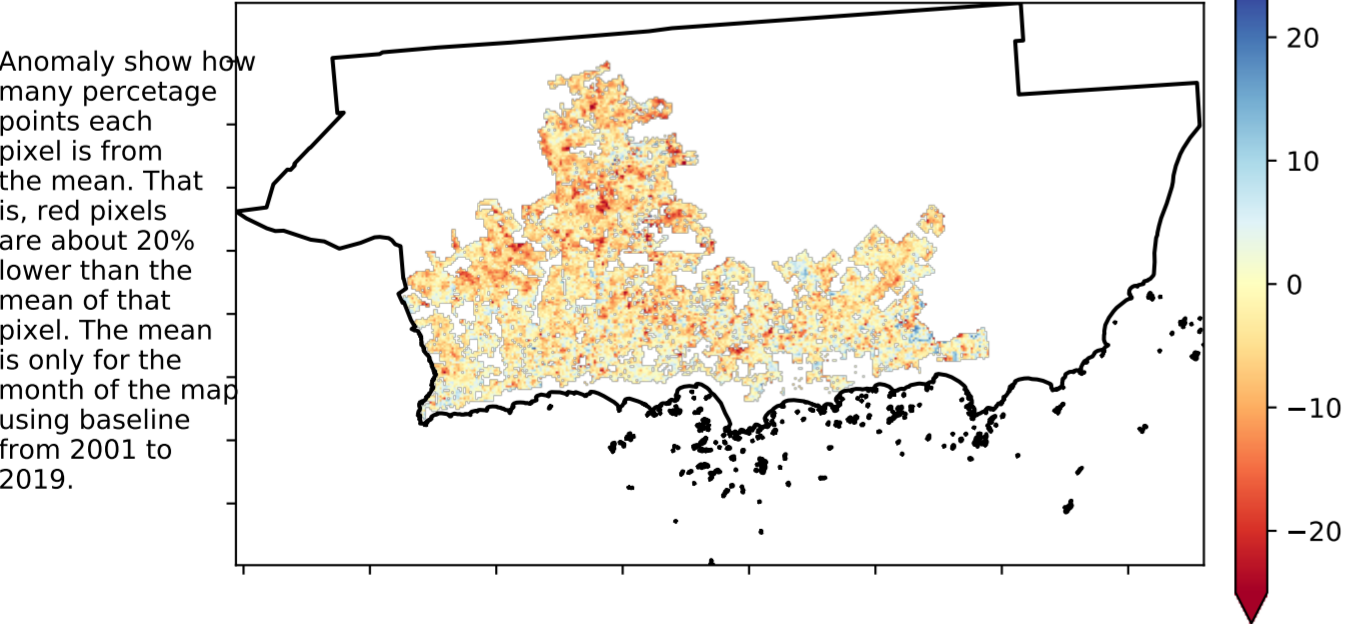
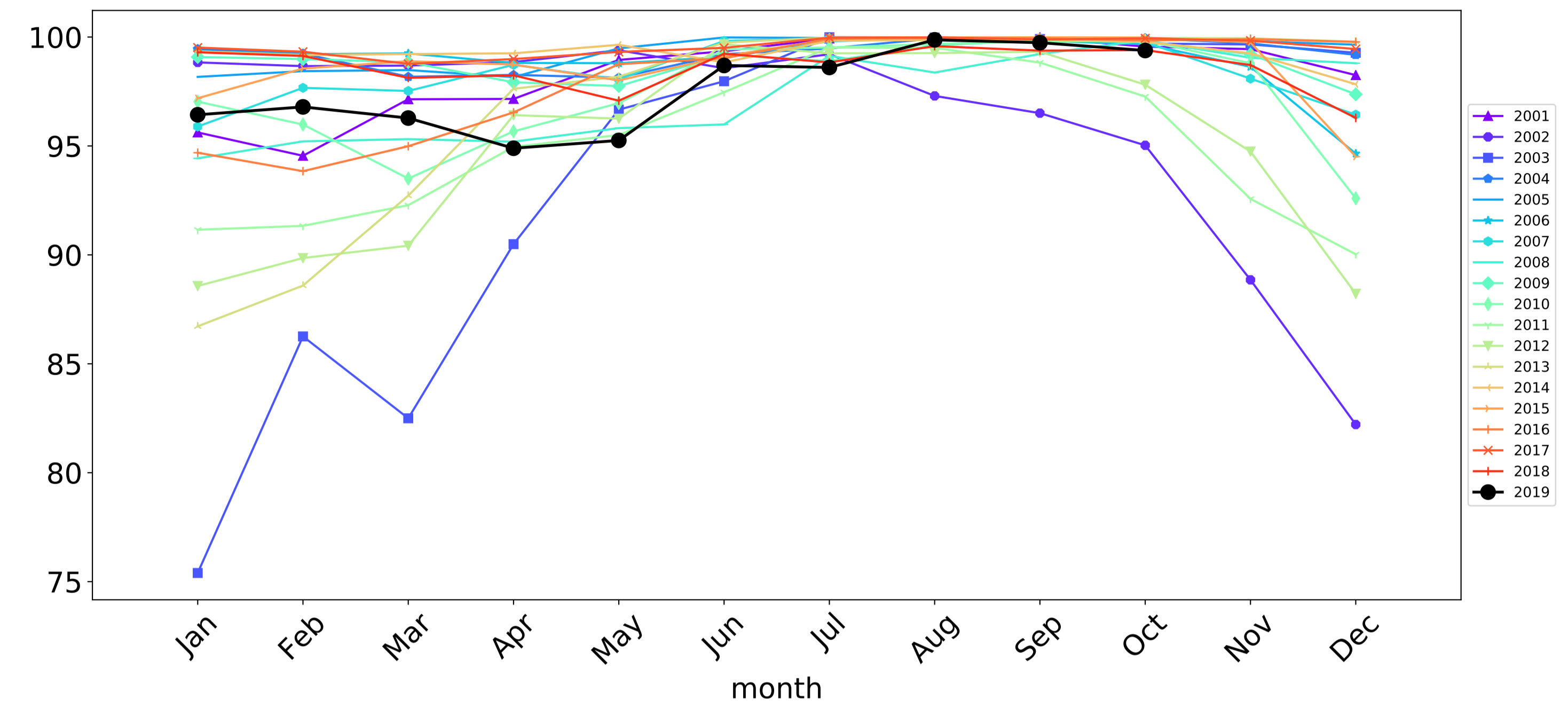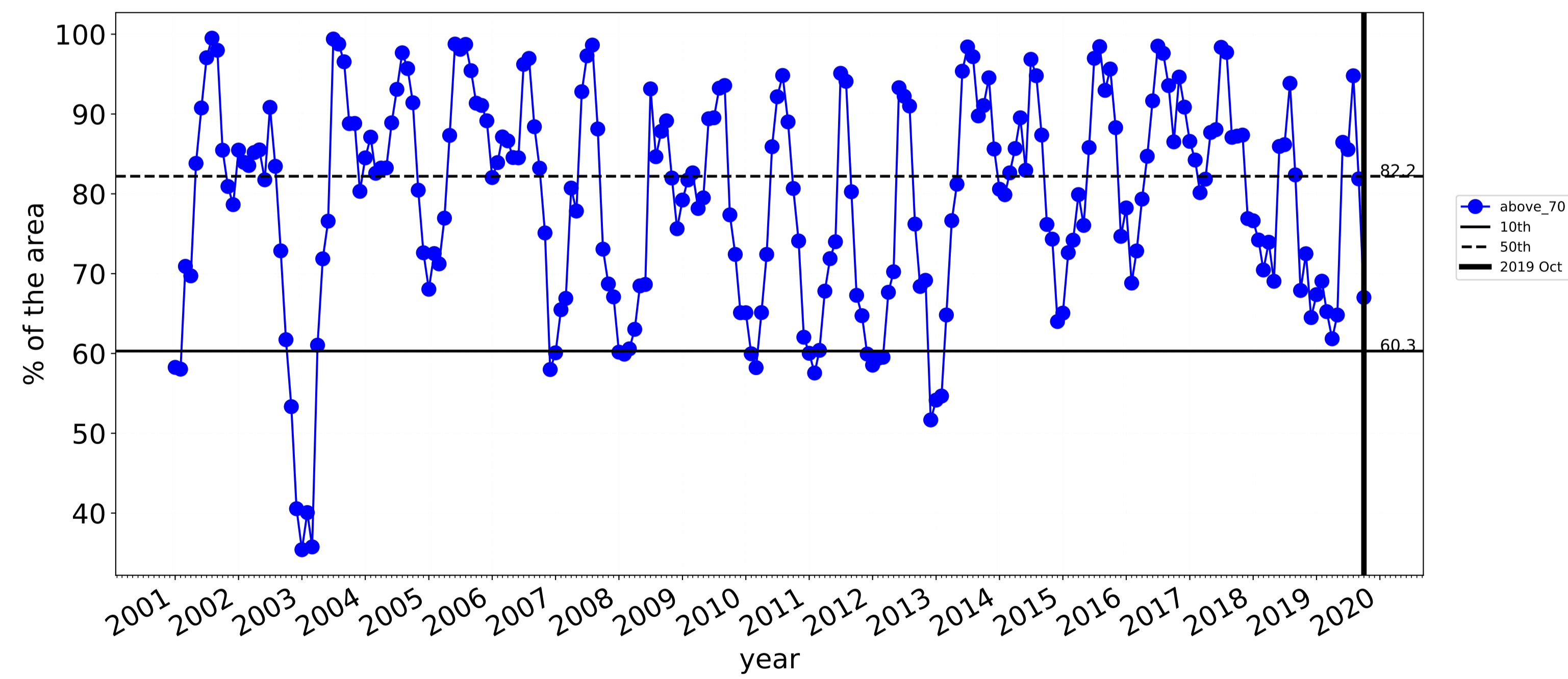# Agriculture timeseries

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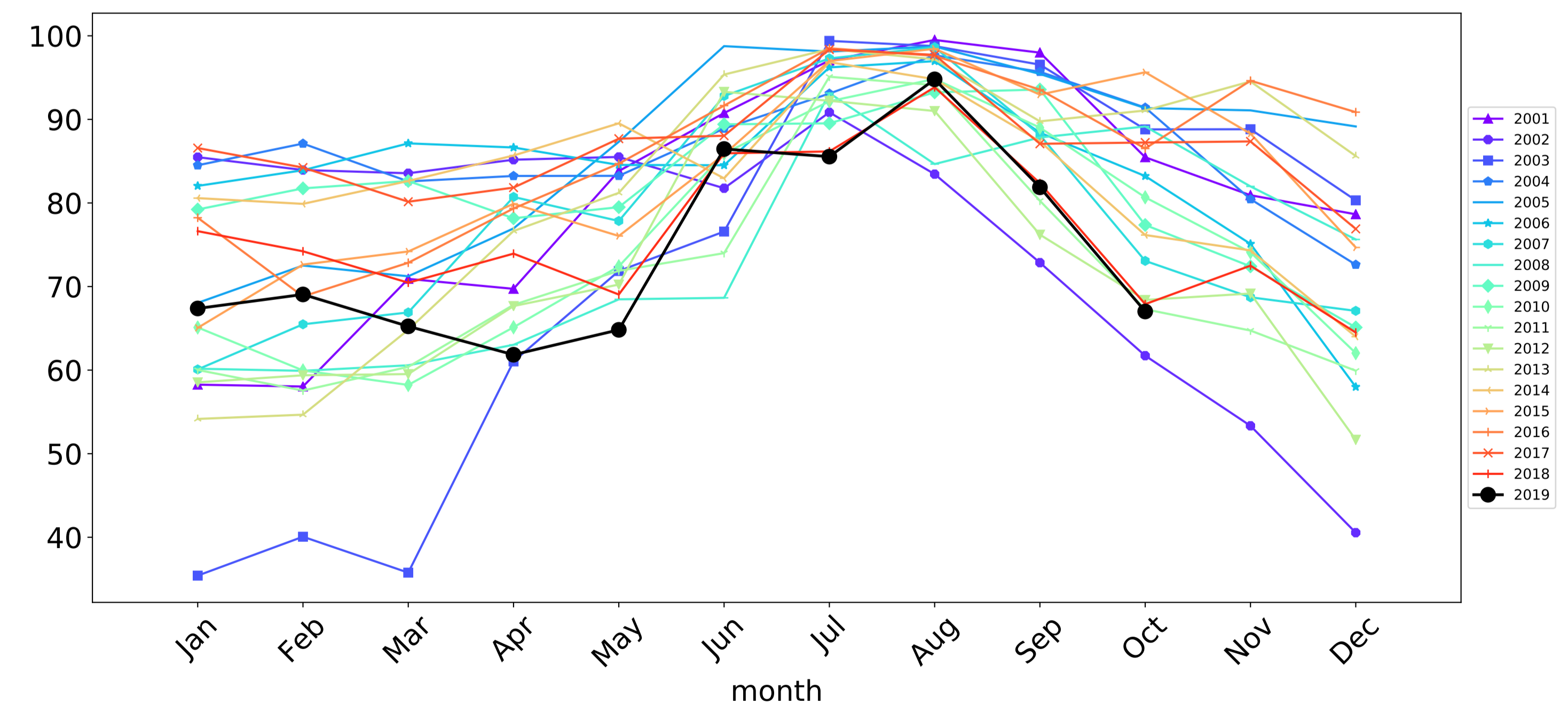

Wind erosion historical monthly area protected (Total Veg Cov >50%)

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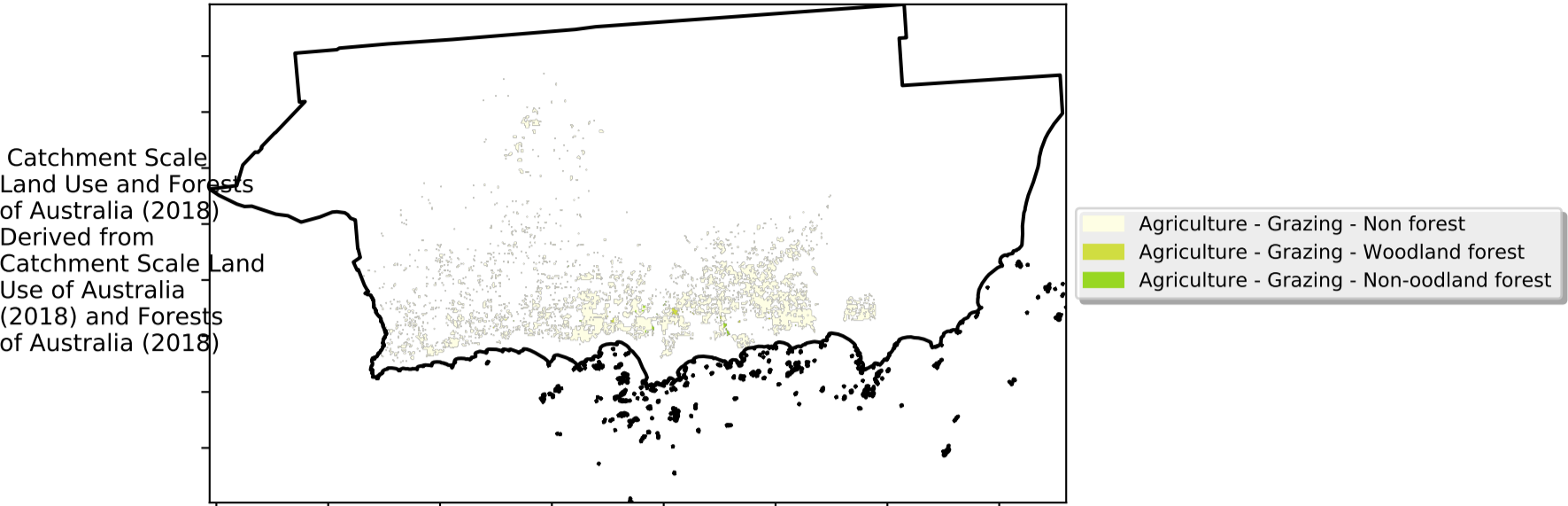

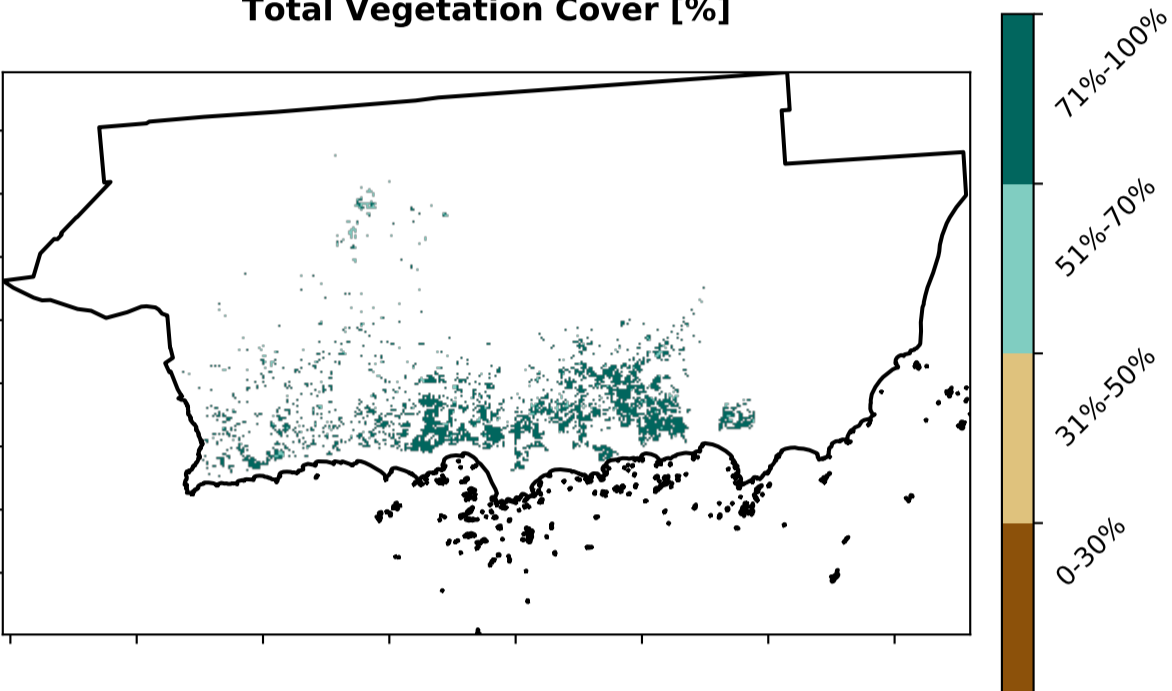## Water erosion historical monthly area protected (Total Veg Cov>70%)
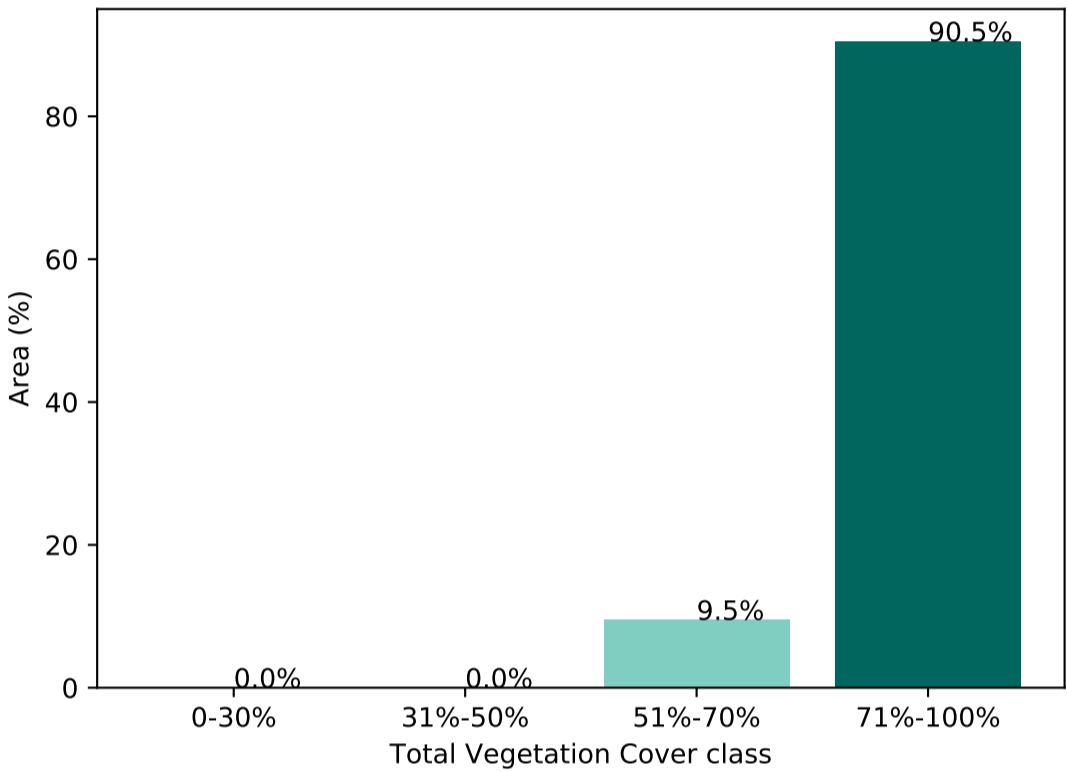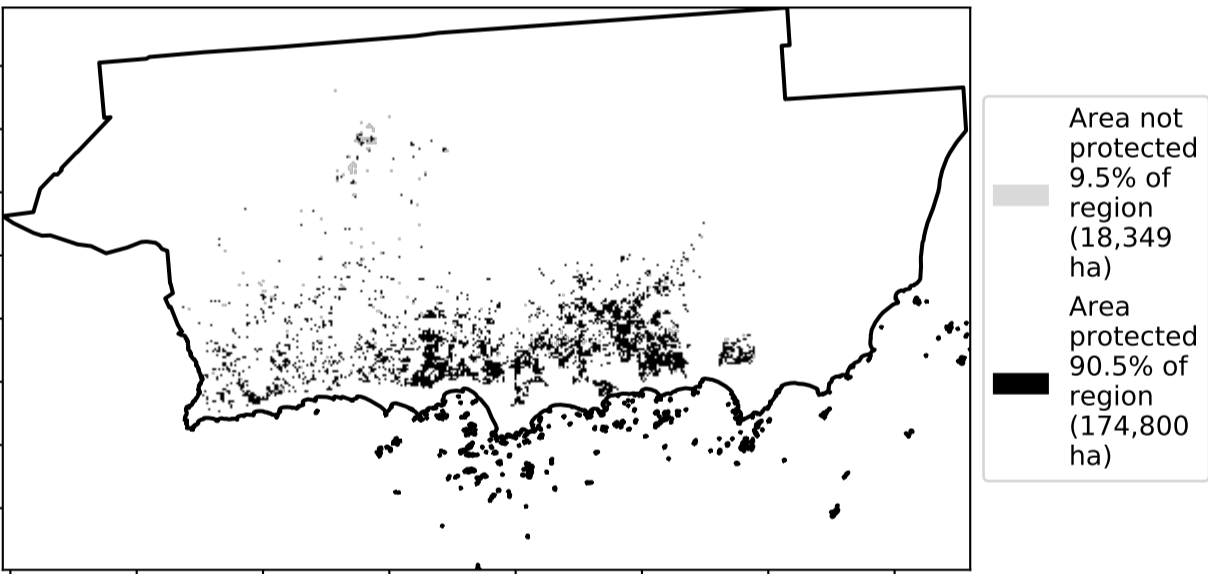
Grazing

Land use and forest cover

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

- Agriculture - Grazing - Non forest
- Agriculture - Grazing - Woodland forest
- Agriculture - Grazing - Non-oodland forest

Total Vegetation Cover [%]

71%-100%
51%-70%
31%-50%
0-30%

Proportion of vegetation cover class in area

90.5%

9.5%

0.0%   0.0%

Area (%)

Total Vegetation Cover class

0-30%   31%-50%   51%-70%   71%-100%

% Area protected from water erosion (>70%)

Area not
protected
9.5% of
region
(18,349
ha)

Area
protected
90.5% of
region
(174,800
ha)

% Area protected from wind erosion (>50%)

Area
protected
100.0% of
region
(193,150
ha)

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.

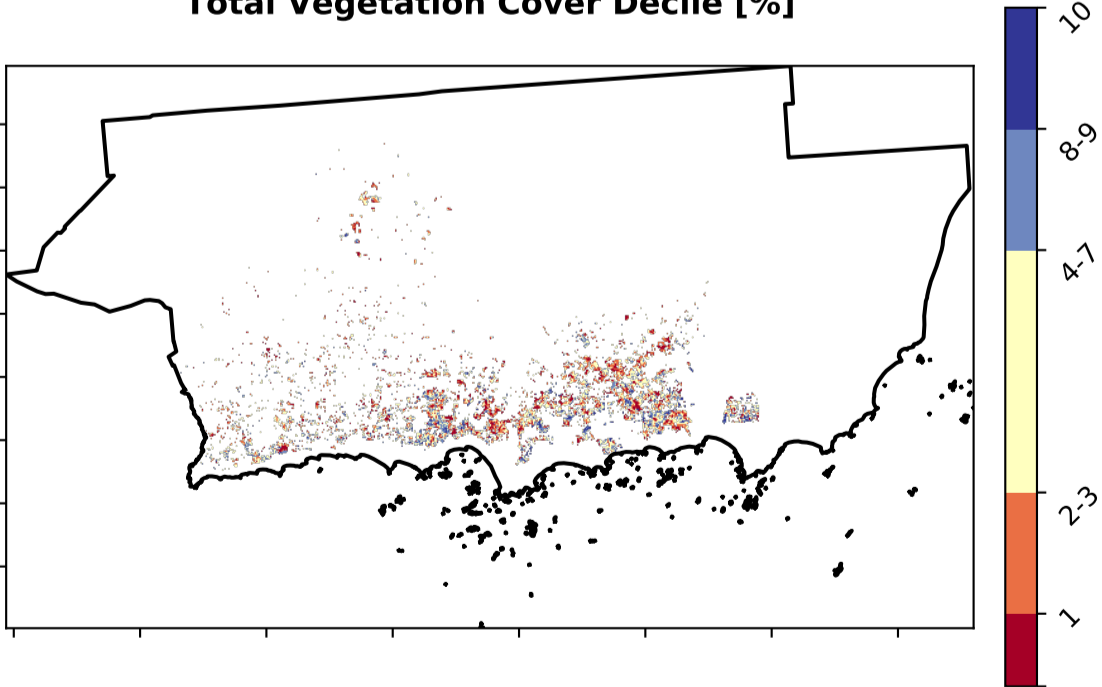## Total Vegetation Cover Decile [%]

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
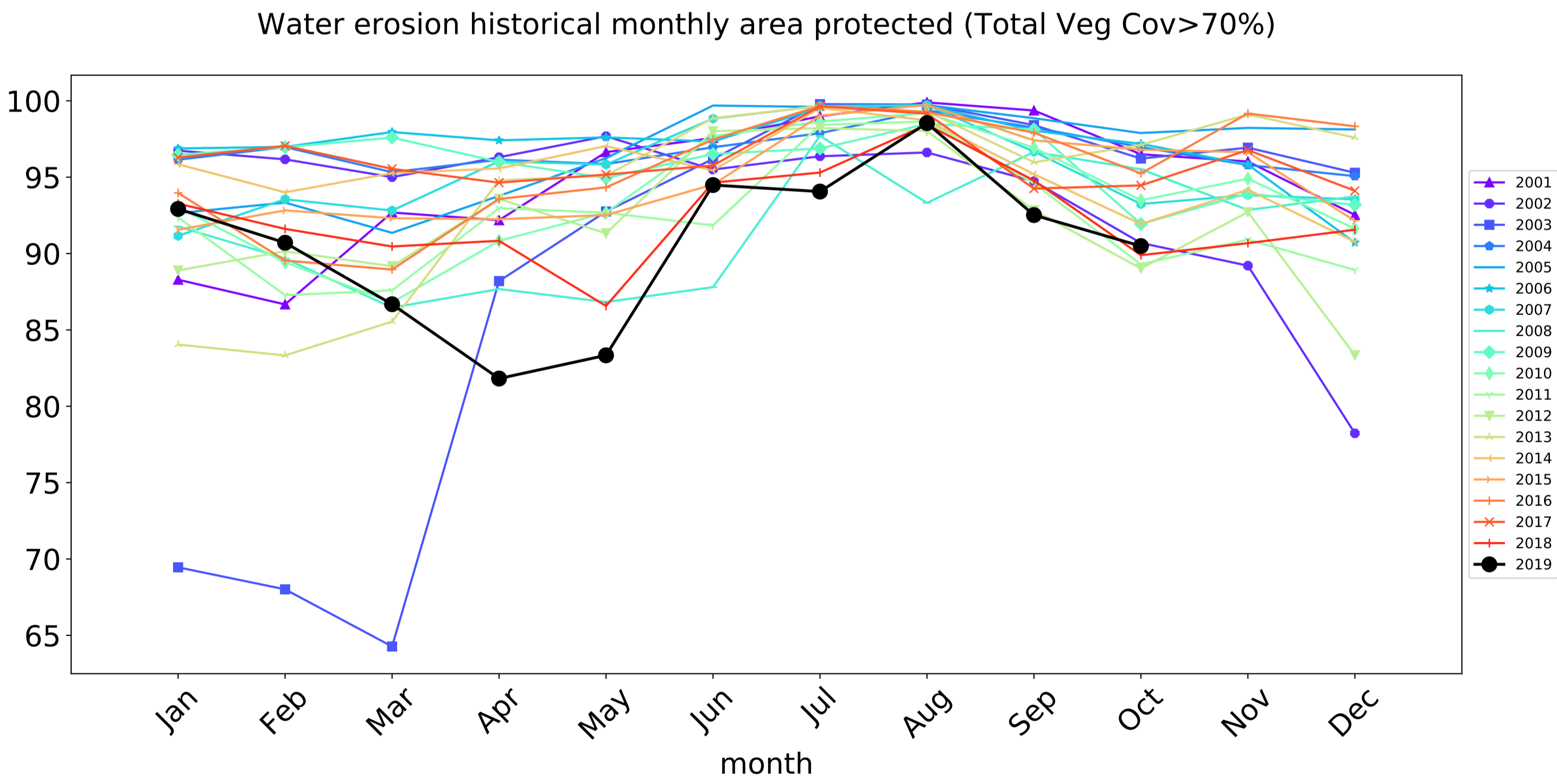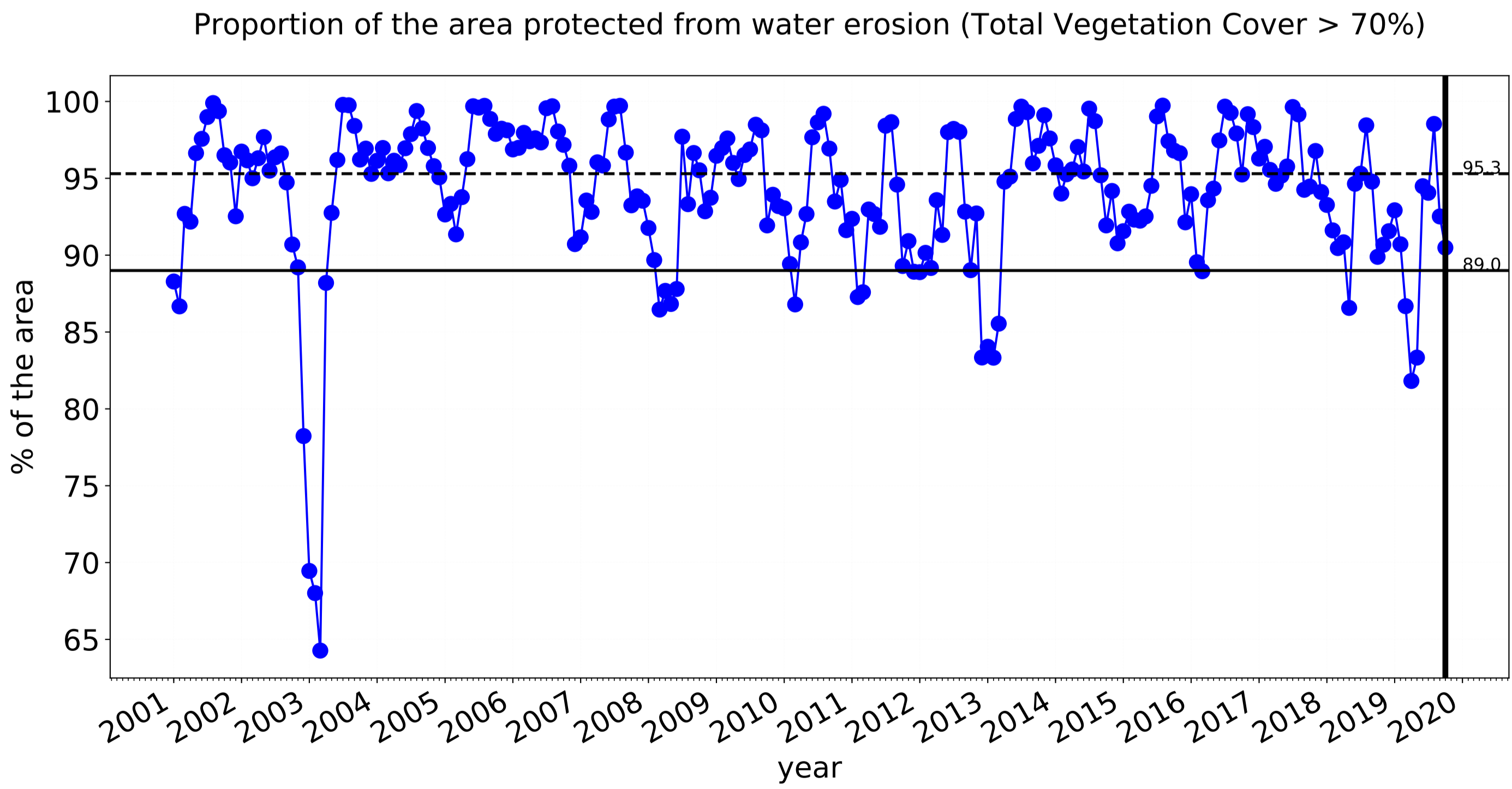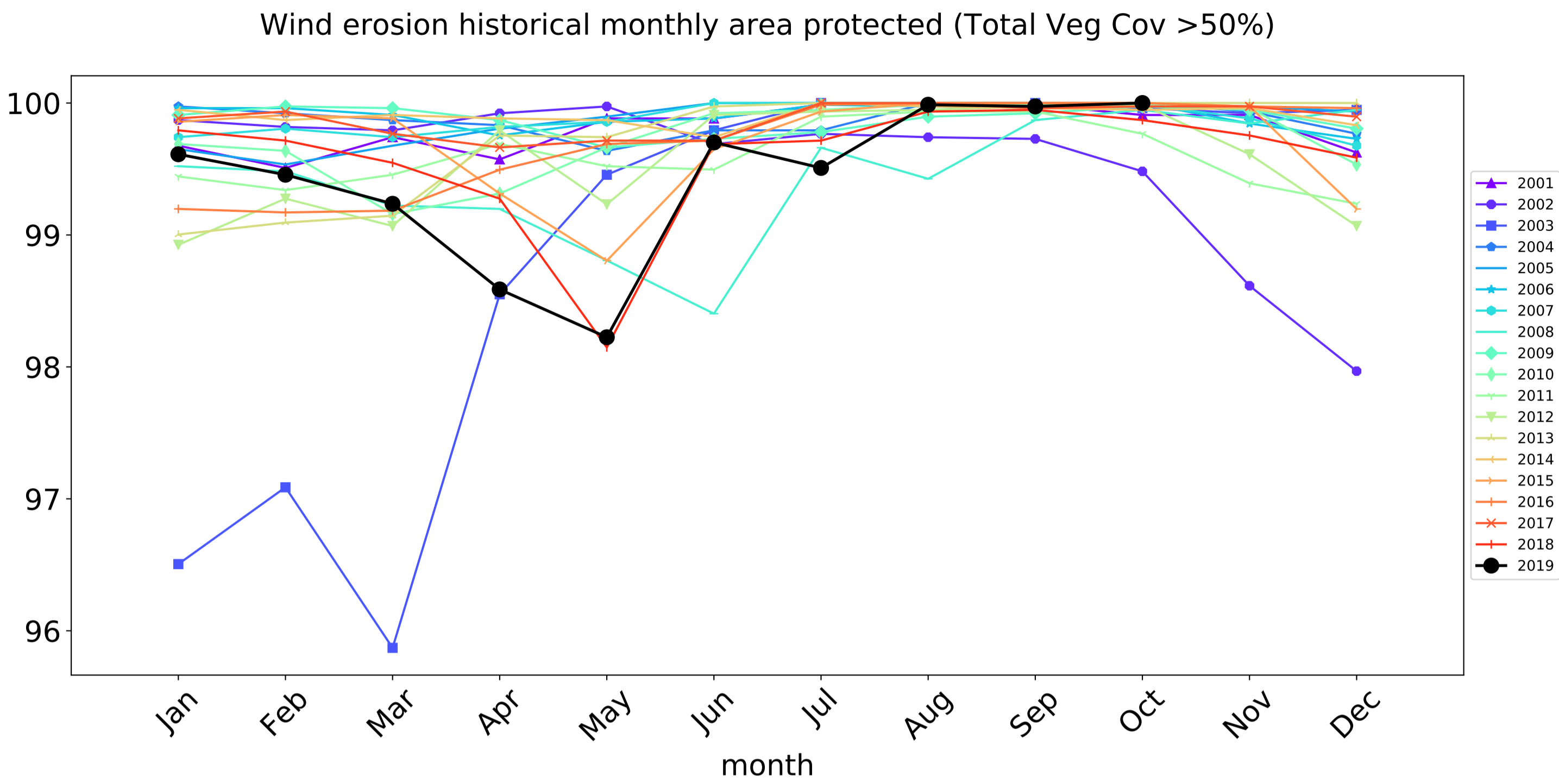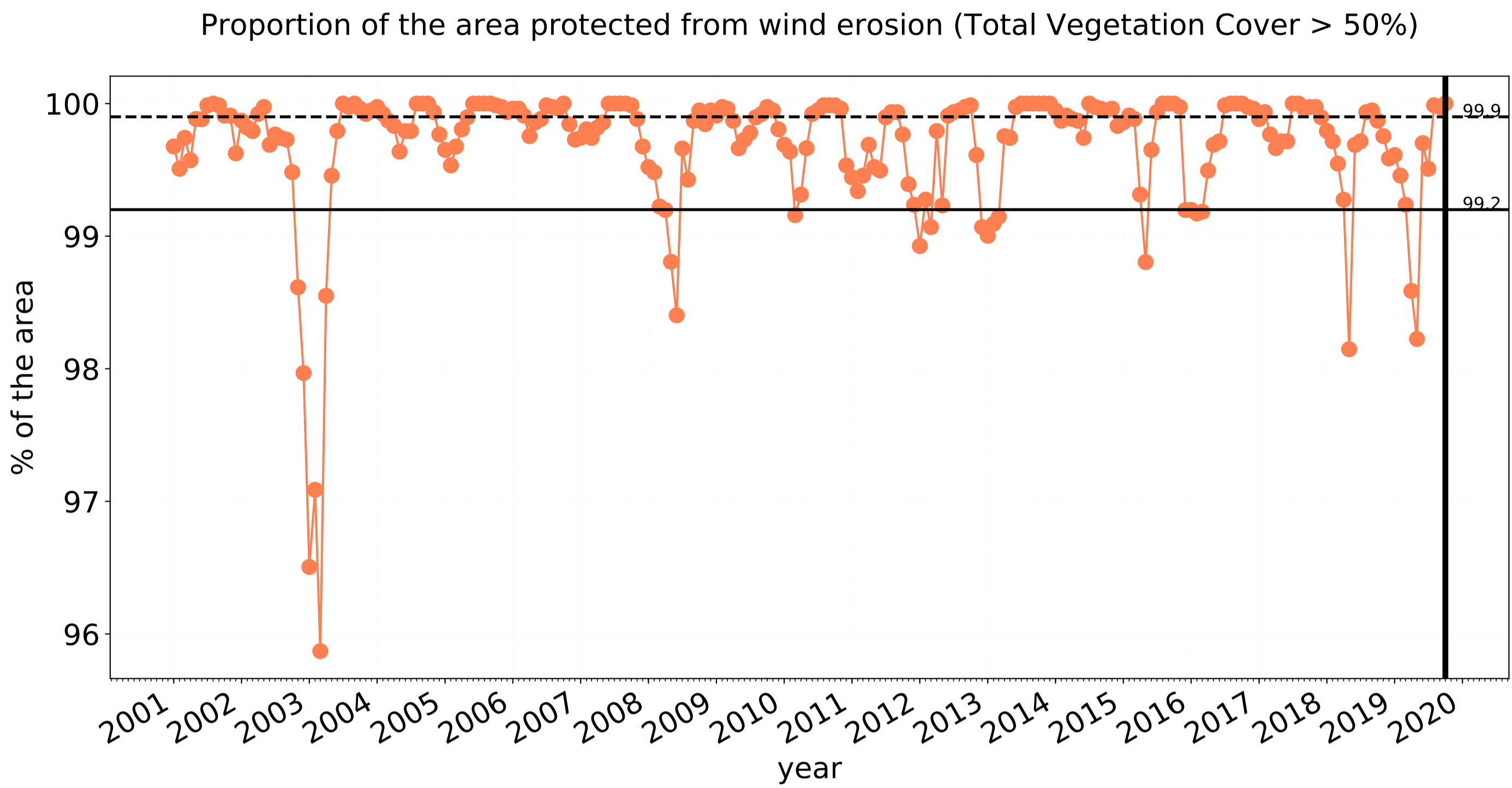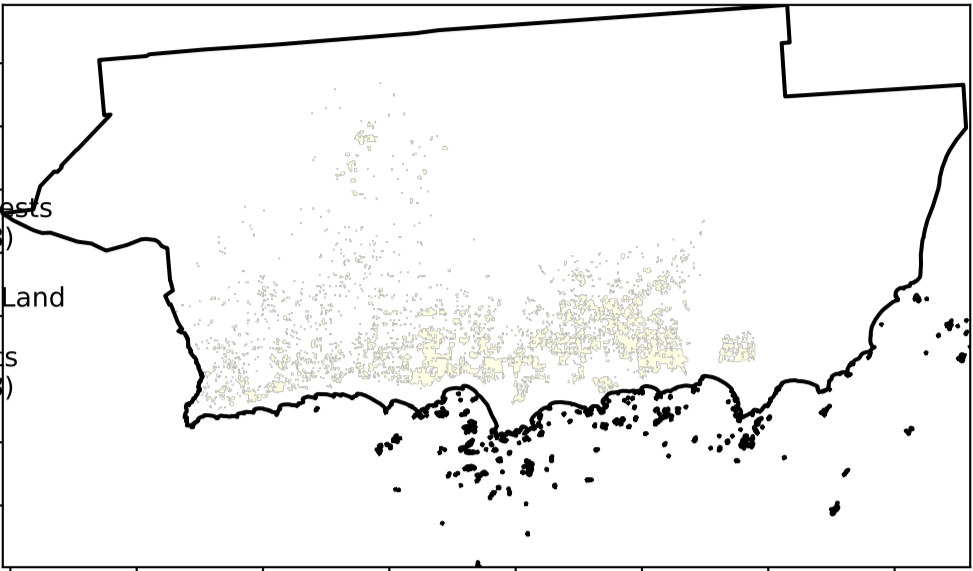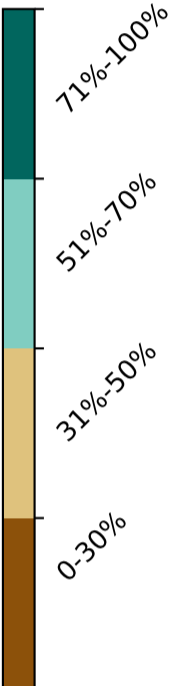records for that month of
the map using baseline
from 2001 to 2019.

10
8-9
4-7
2-3
1

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%)
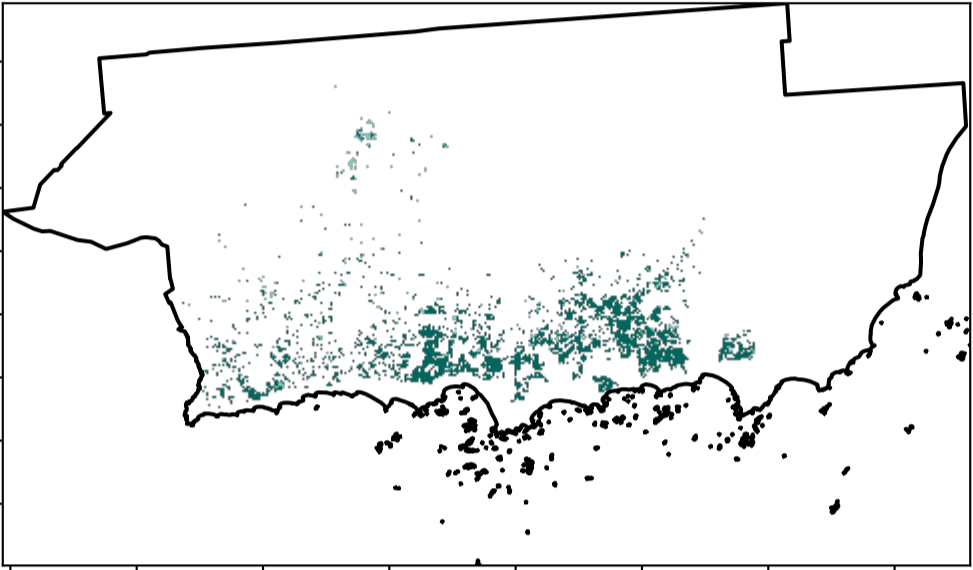
Grazing non forest

Land use and forest cover

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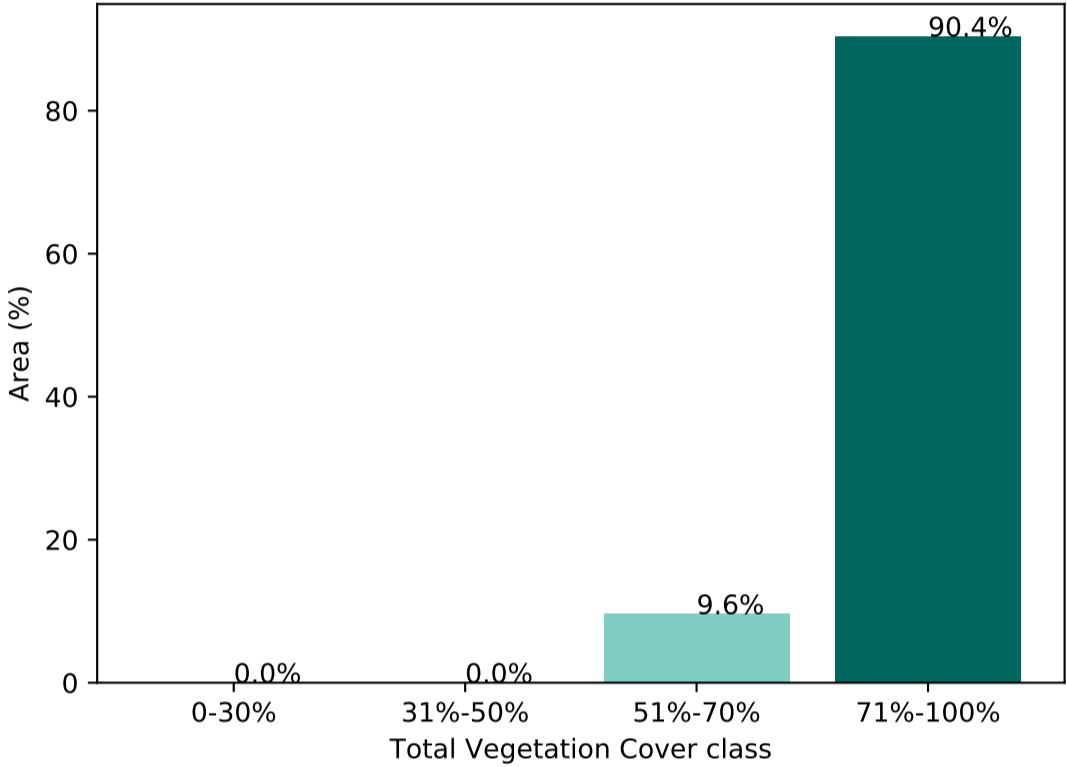
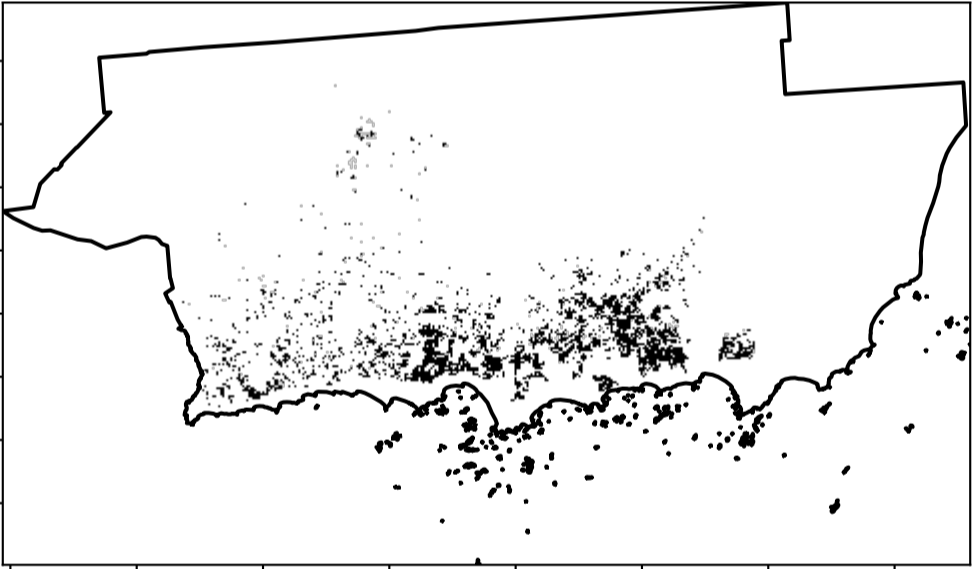Agriculture - Grazing - Non forest

Total Vegetation Cover [%]

71%-100%

51%-70%

31%-50%

0-30%

Proportion of vegetation cover class in area

90.4%

9.6%

0.0%   0.0%

Area (%)

0-30%   31%-50%   51%-70%   71%-100%
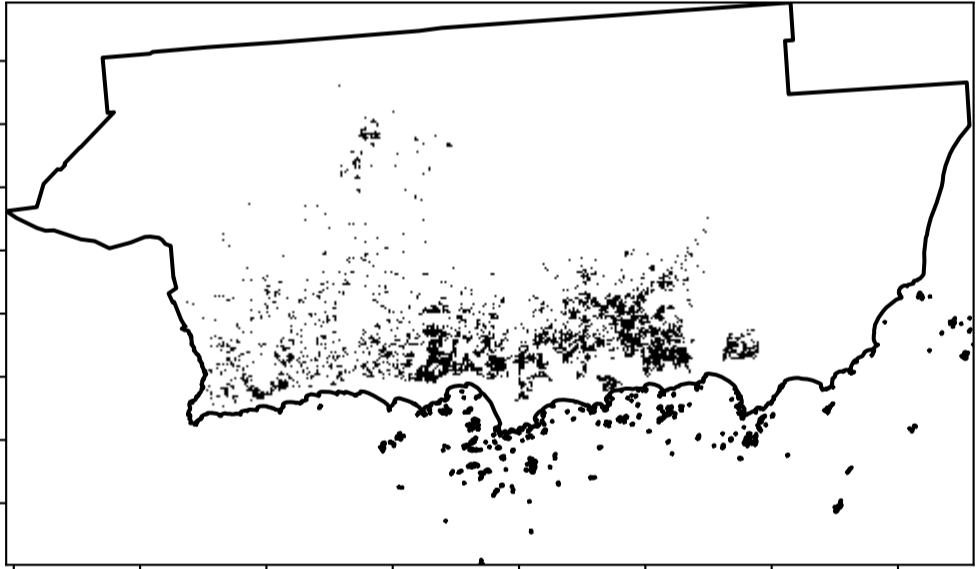
Total Vegetation Cover class

% Area protected from water erosion (>70%)

Area not protected 9.6% of region (18,302 ha)
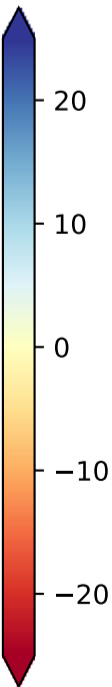
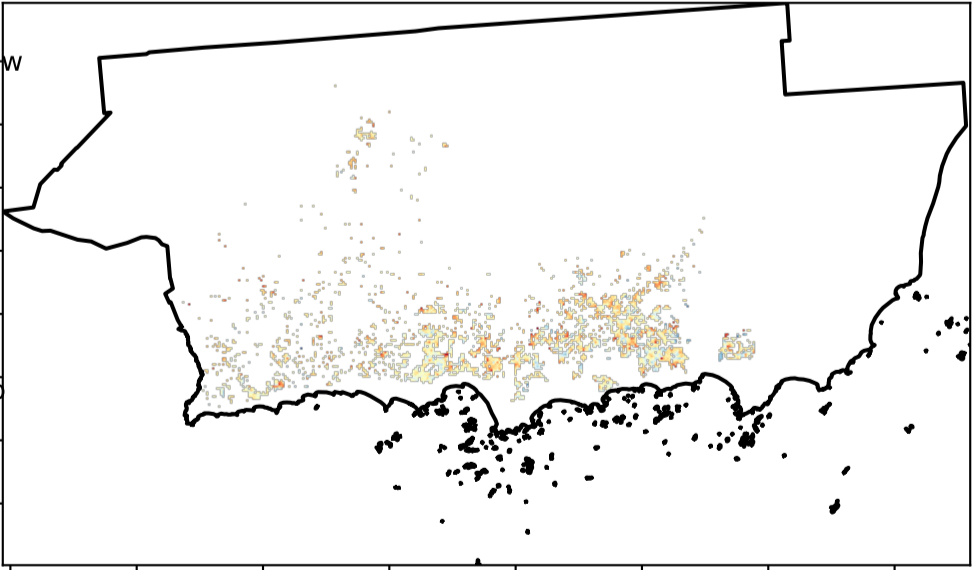Area protected 90.4% of region (172,347 ha)

% Area protected from wind erosion (>50%)

Area protected 100.0% of region (190,650 ha)

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.
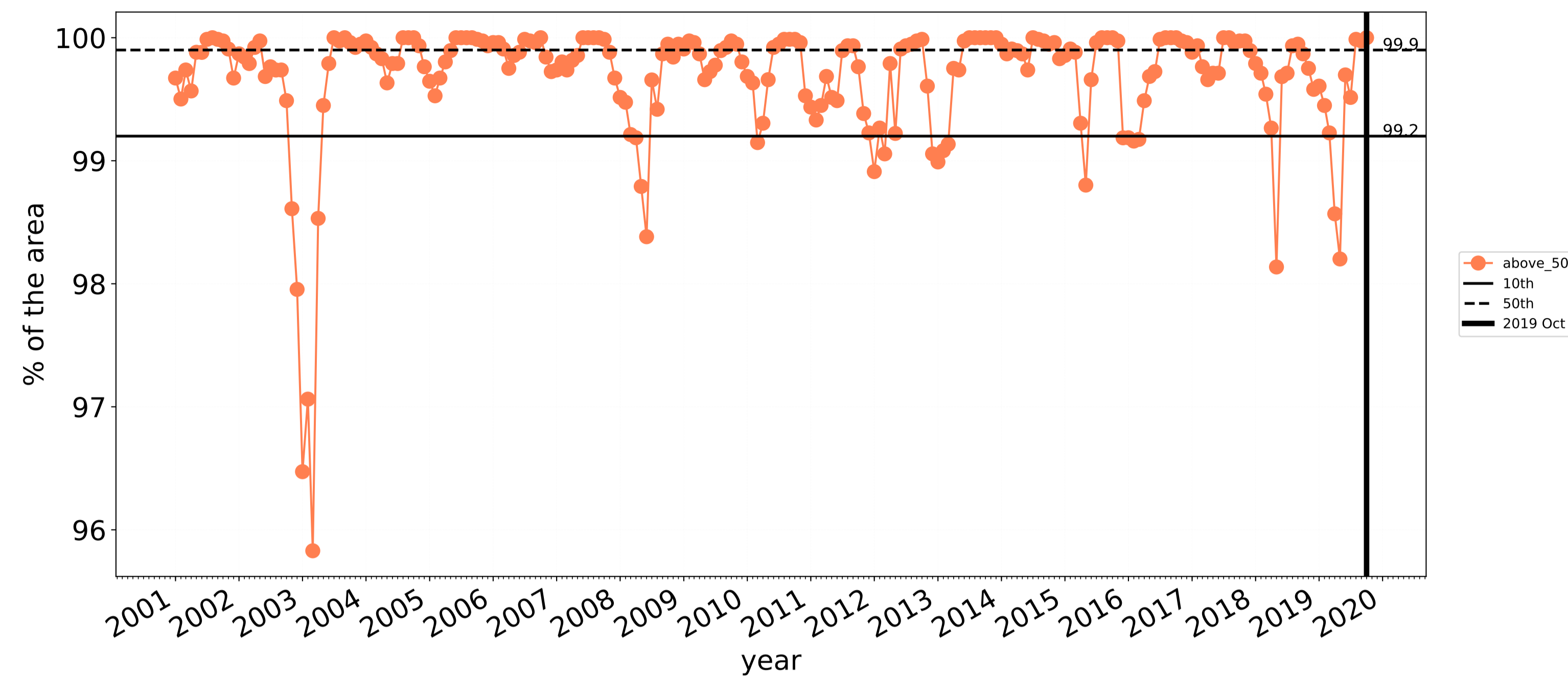
10

8-9

4-7

2-3
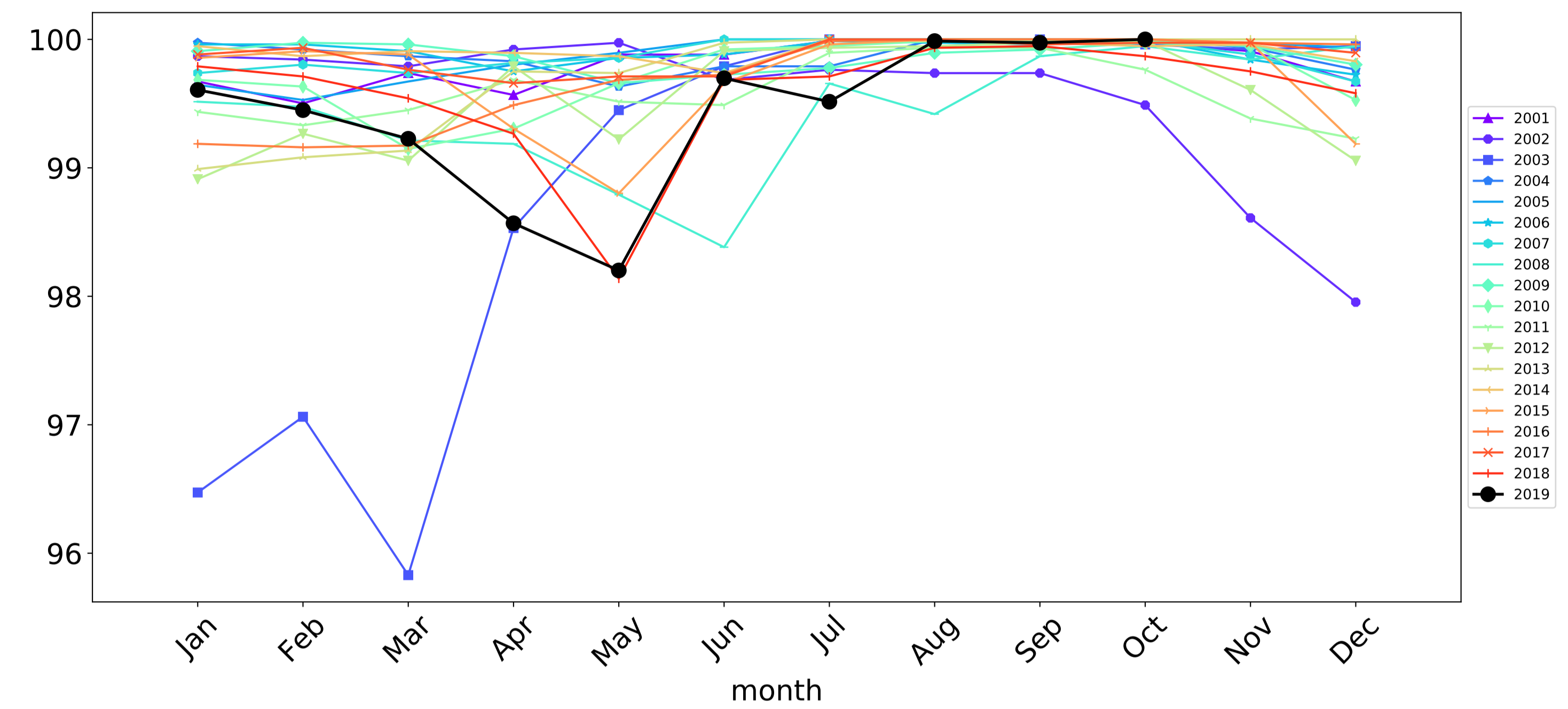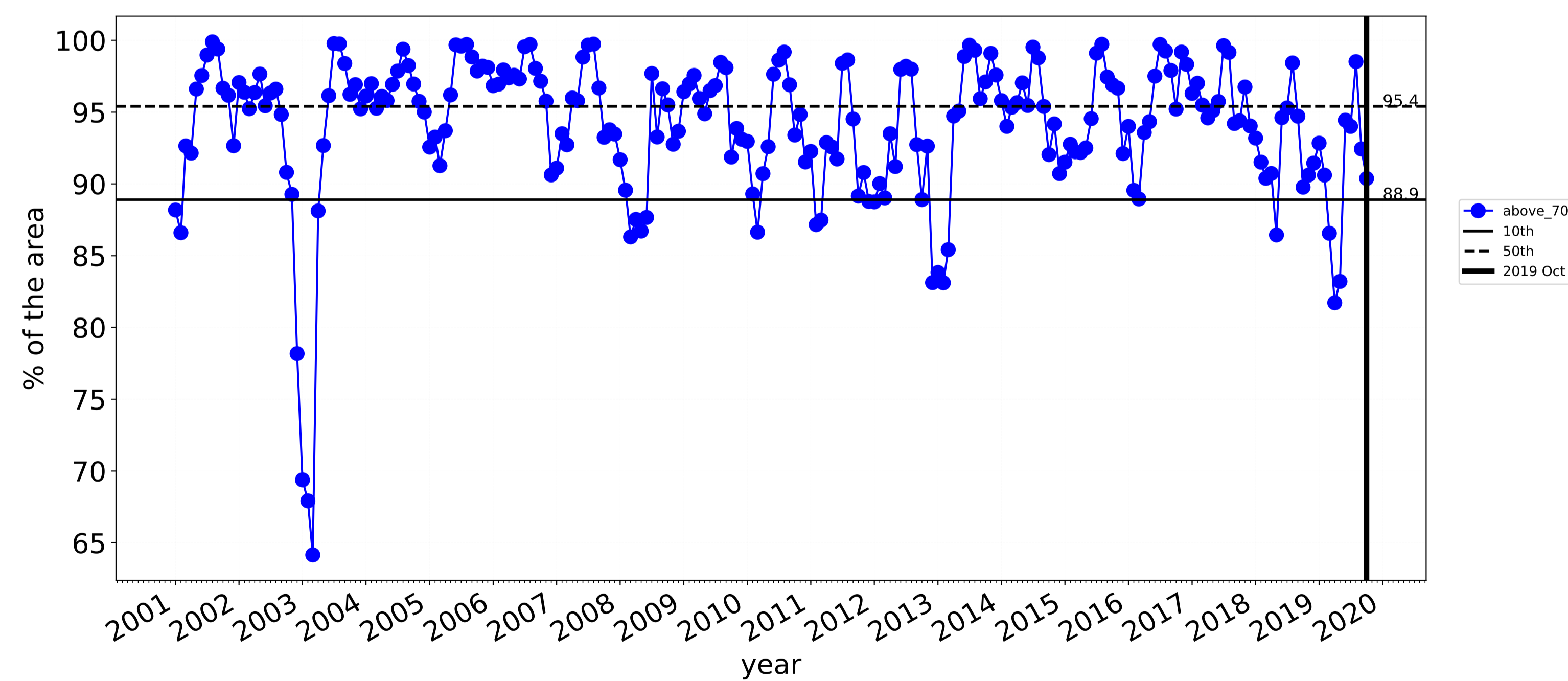
1
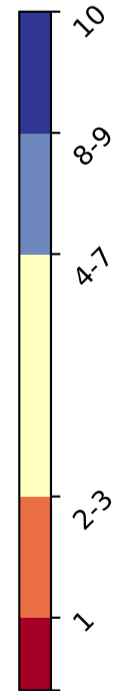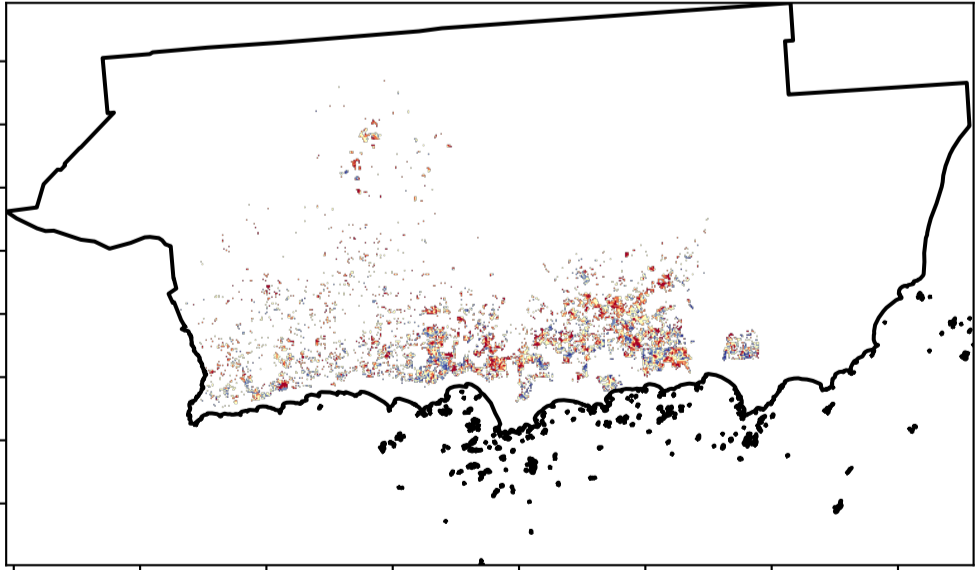
Grazing non forest timeseries

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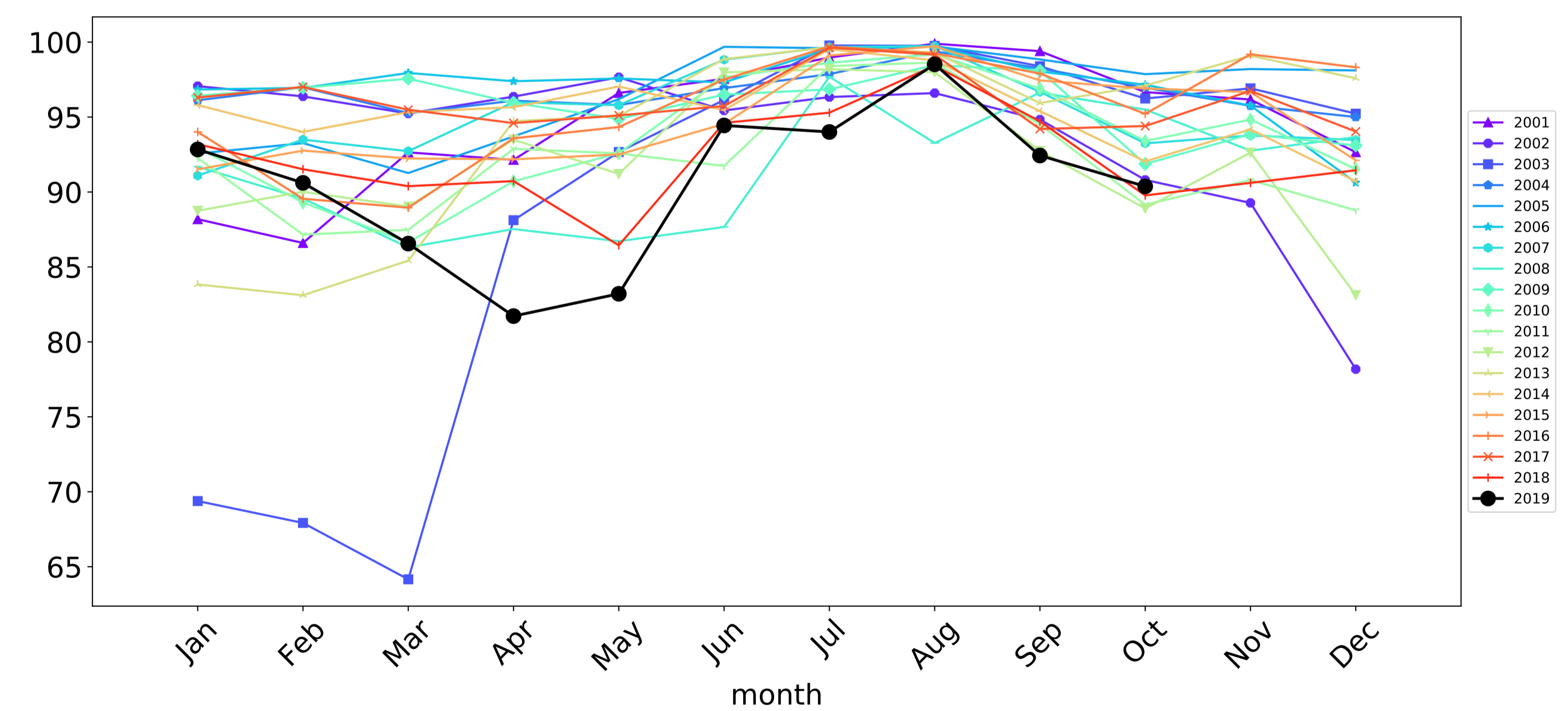

Wind erosion historical monthly area protected (Total Veg Cov >50%)

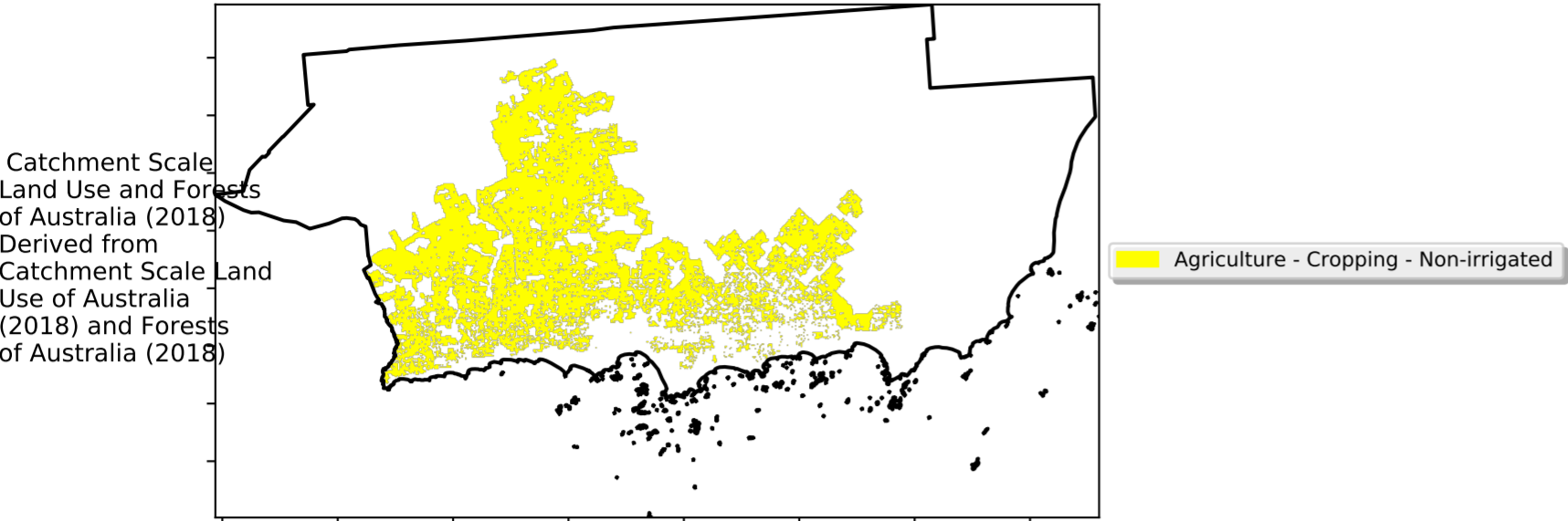### Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)

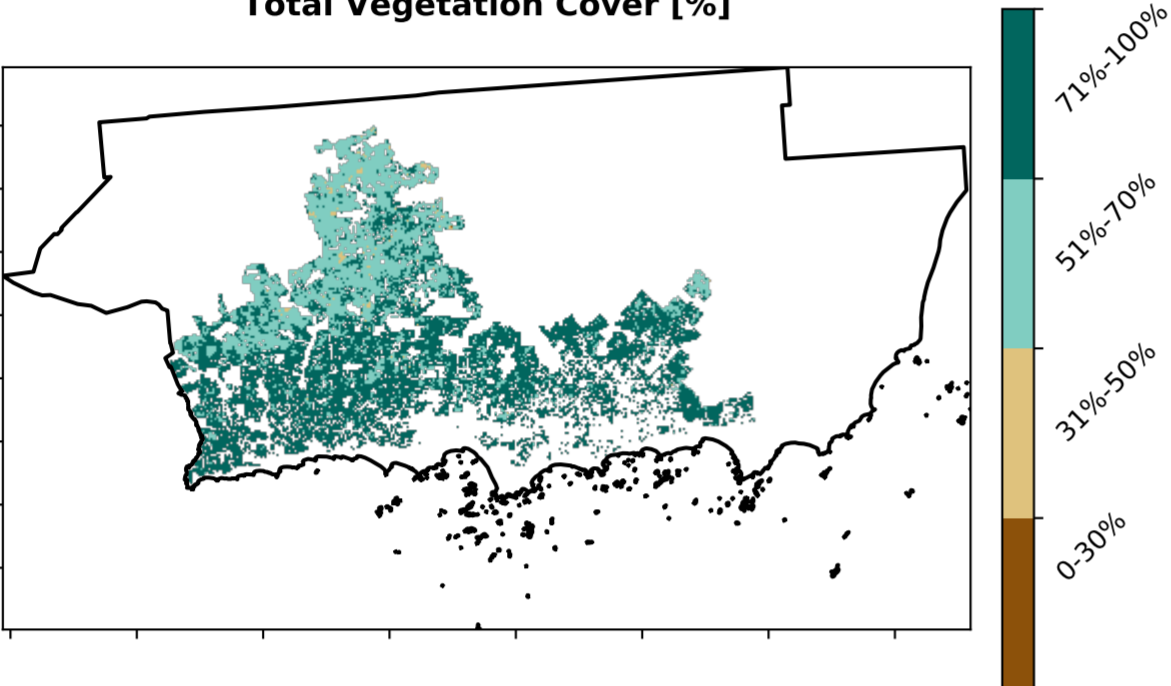### Water erosion historical monthly area protected (Total Veg Cov>70%)

Cropping

Land use and forest cover

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

■ Agriculture - Cropping - Non-irrigated

Total Vegetation Cover [%]

- 71%-100%
- 51%-70%
- 31%-50%
- 0-30%

Proportion of vegetation cover class in area

Area (%)

0.0%   0.7%   36.8%   62.5%

Total Vegetation Cover class

% Area protected from water erosion (>70%)

Area not
protected
37.5% of
region
(374,437
ha)

Area
protected
62.5% of
region
(624,062
ha)

% Area protected from wind erosion (>50%)

Area not
protected
1.0% of
region
(9,985 ha)

Area
protected
99.0% of
region
(988,515
ha)

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.

- 10
- 8-9
- 4-7
- 2-3
- 1

Cropping 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%)

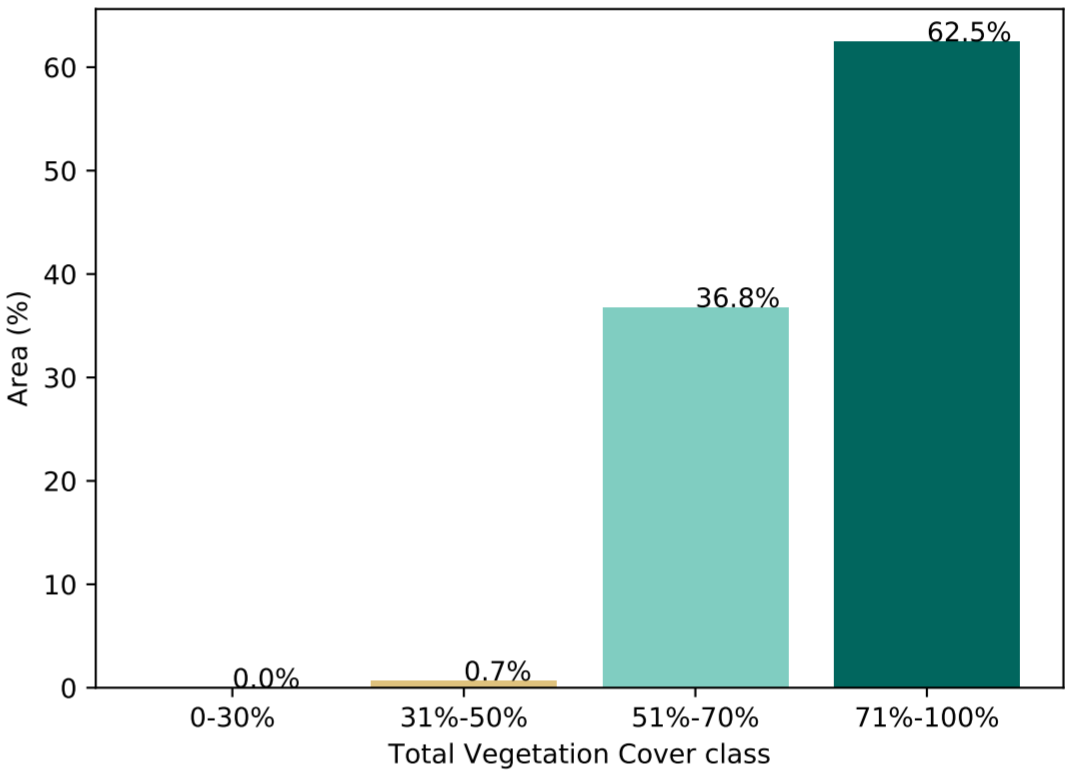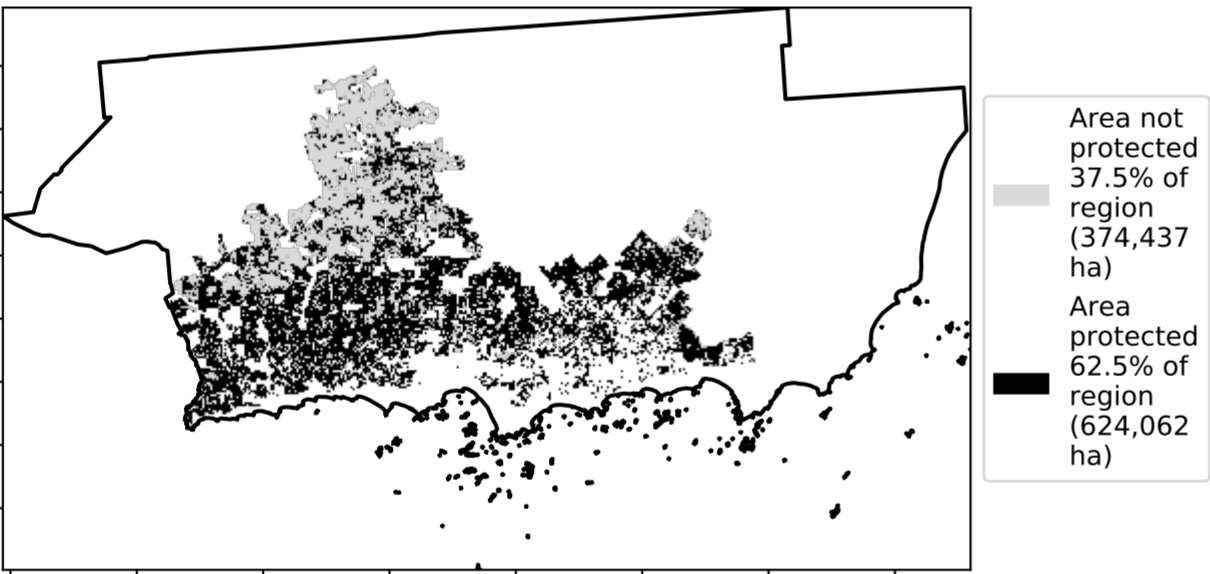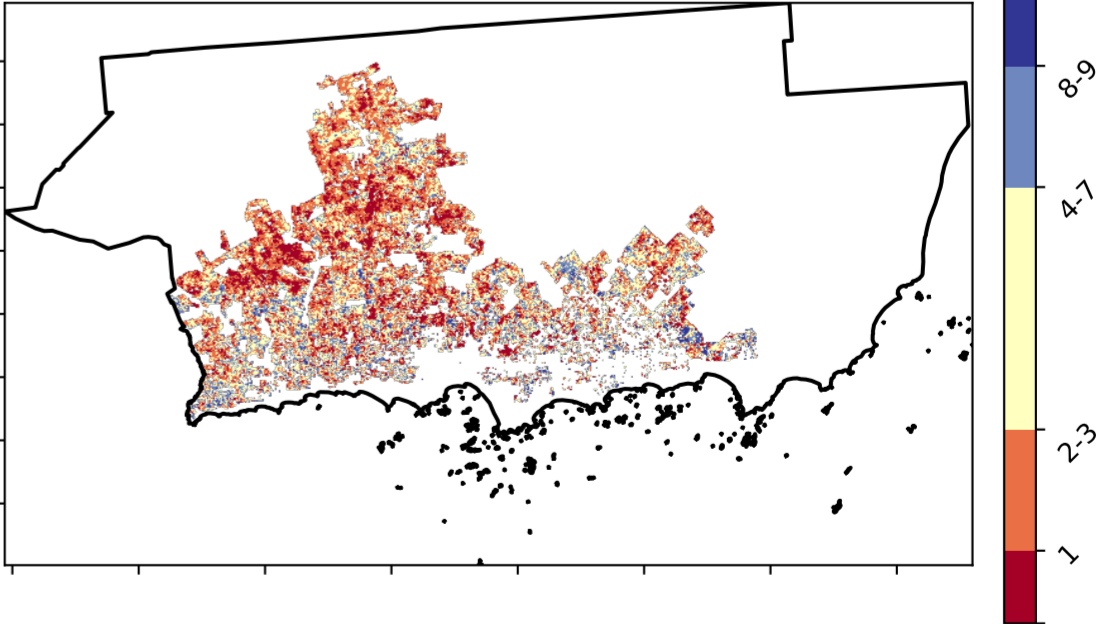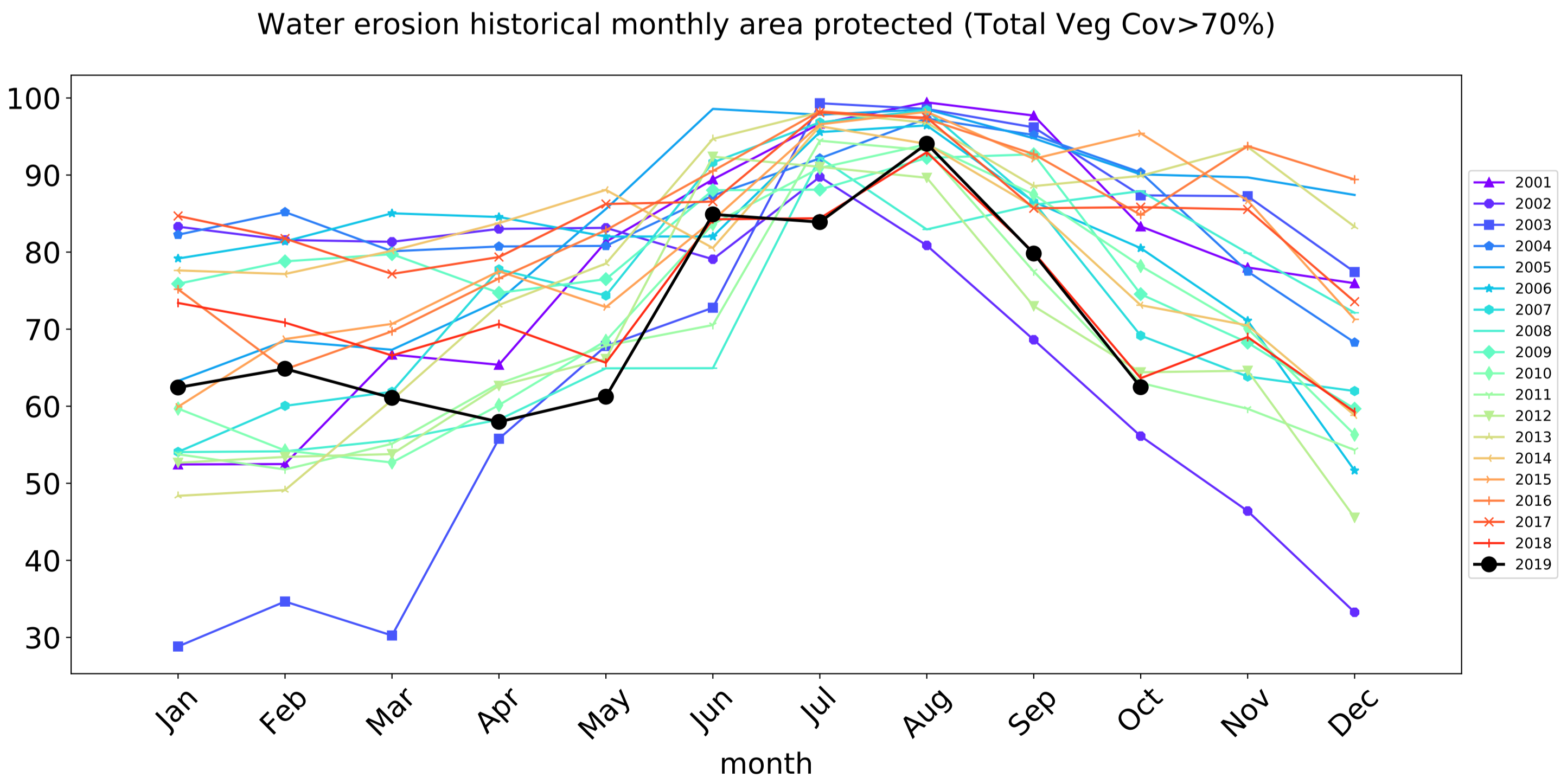### Water erosion historical monthly area protected (Total Veg Cov>70%)
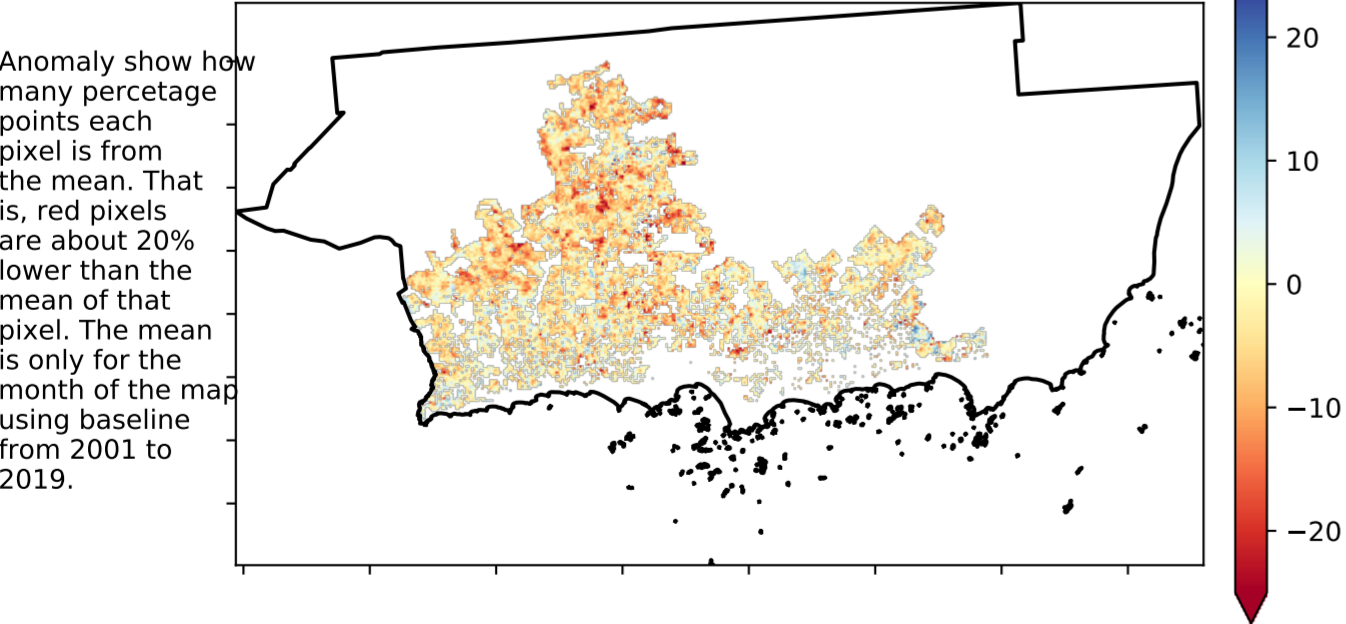
Production native forests and plantation forests

Land use and forest cover

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

■ Production native forests and plantation forests

Total Vegetation Cover [%]

71%-100%
51%-70%
31%-50%
0-30%

Proportion of vegetation cover class in area

91.4%

8.2%

0.0%   0.4%

0-30%   31%-50%   51%-70%   71%-100%

Total Vegetation Cover class

% Area protected from water erosion (>70%)

Area not
protected
8.6% of
region
(4,820 ha)

Area
protected
91.4% of
region
(51,229
ha)

% Area protected from wind erosion (>50%)

Area not
protected
0.0% of
region (0
ha)

Area
protected
100.0% of
region
(56,050
ha)

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
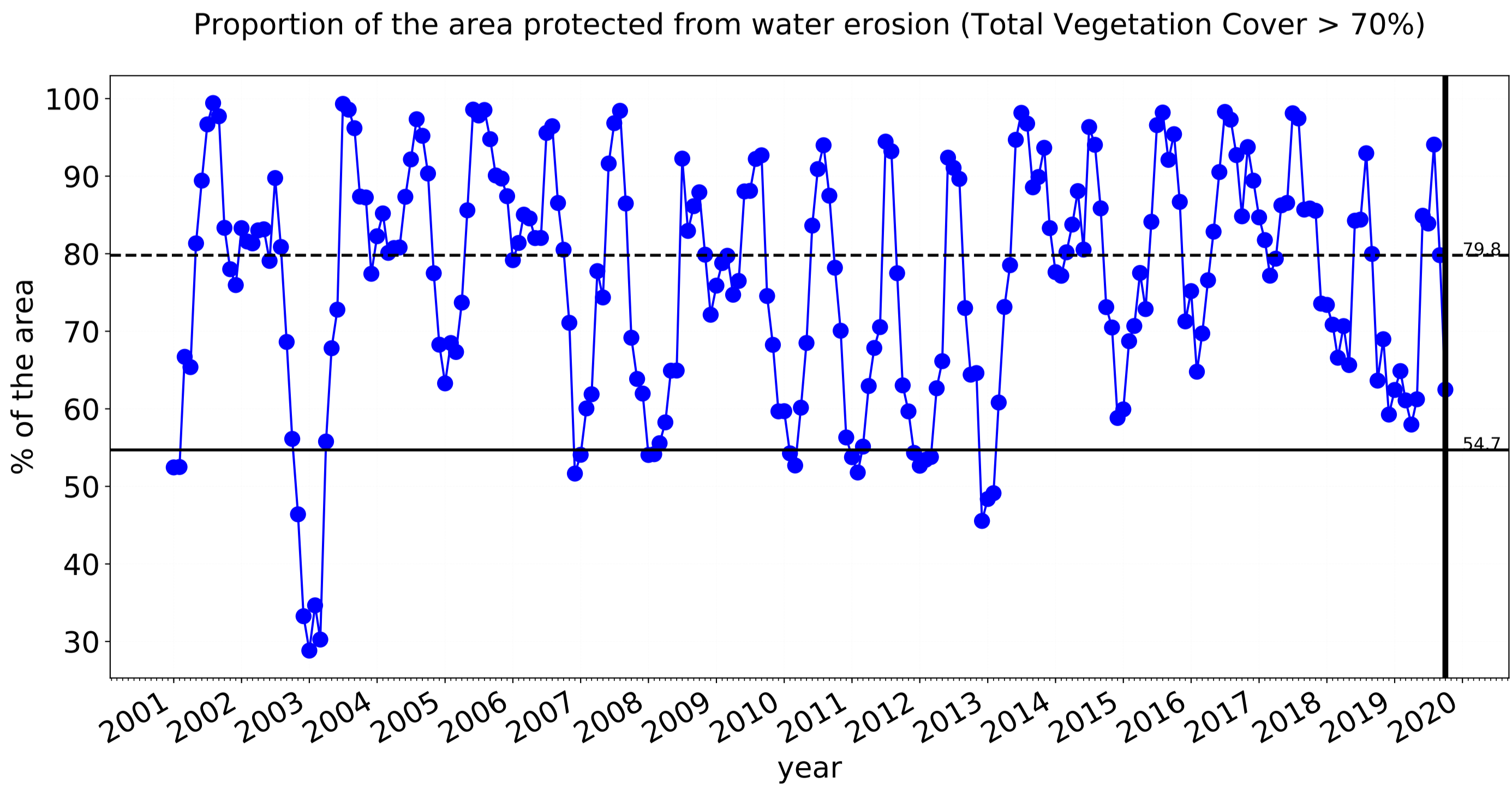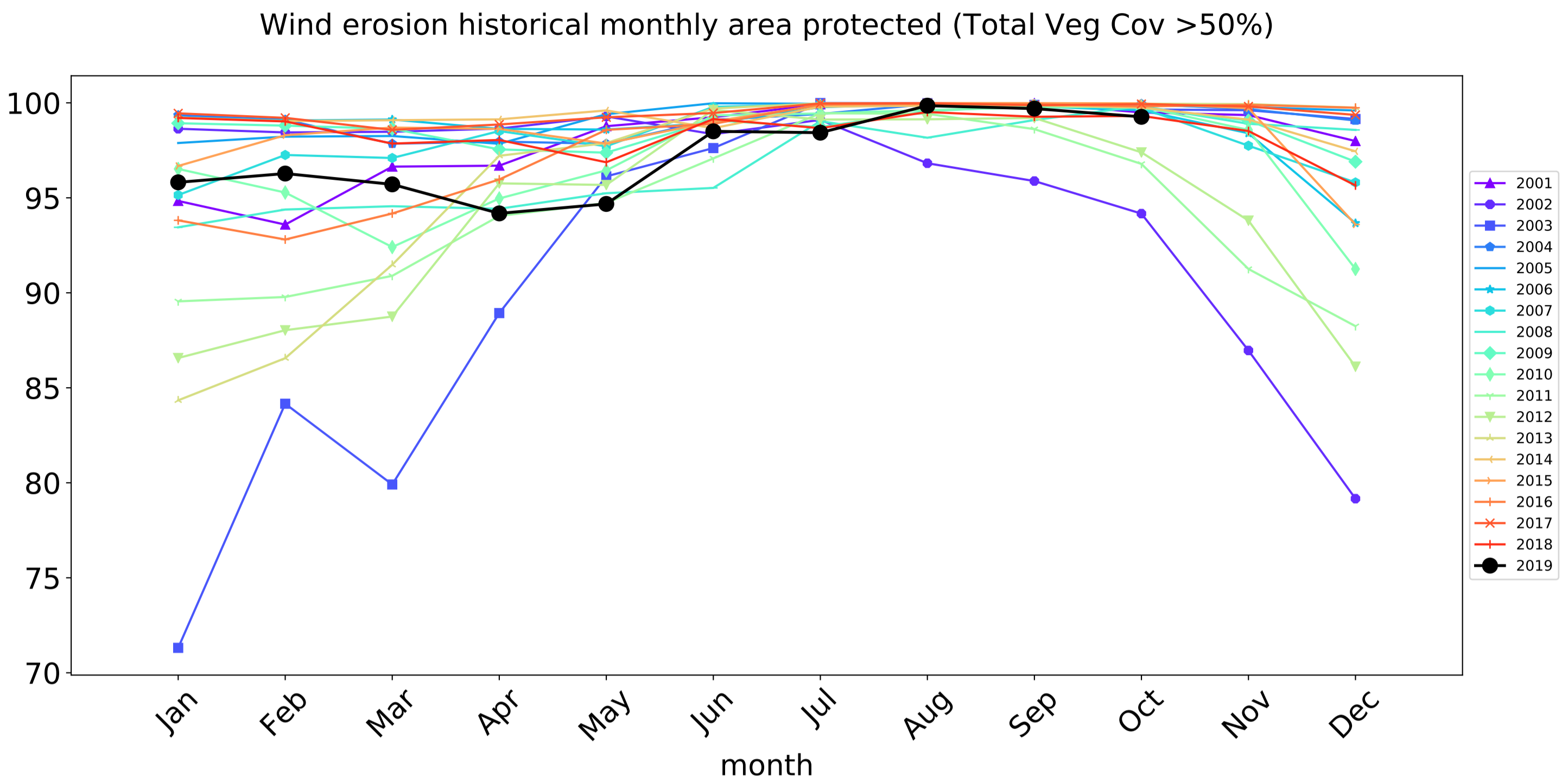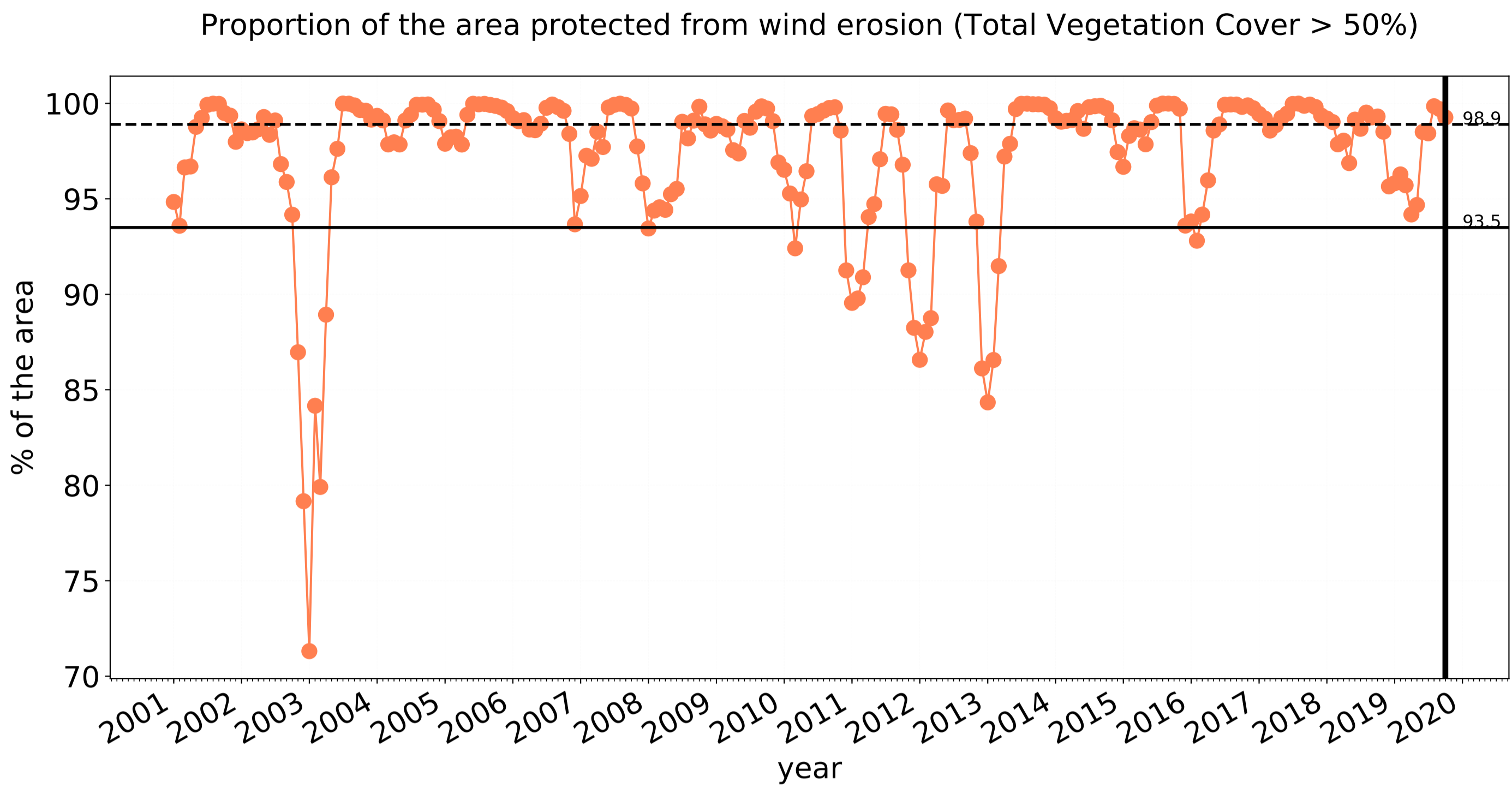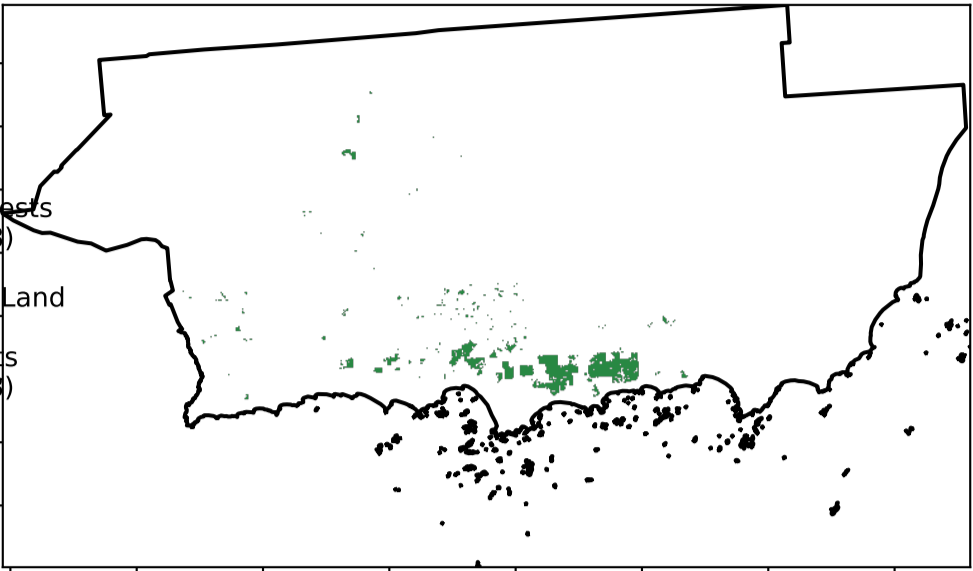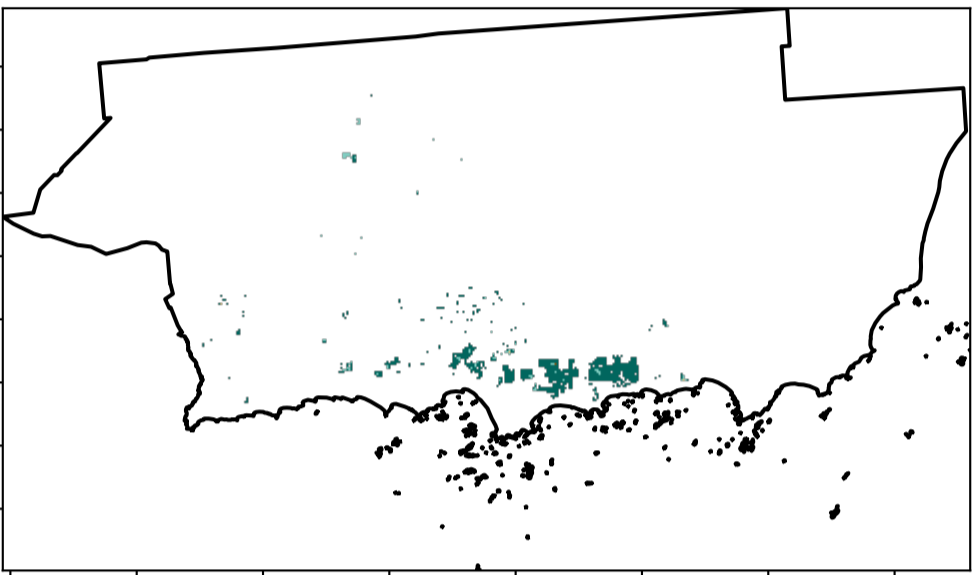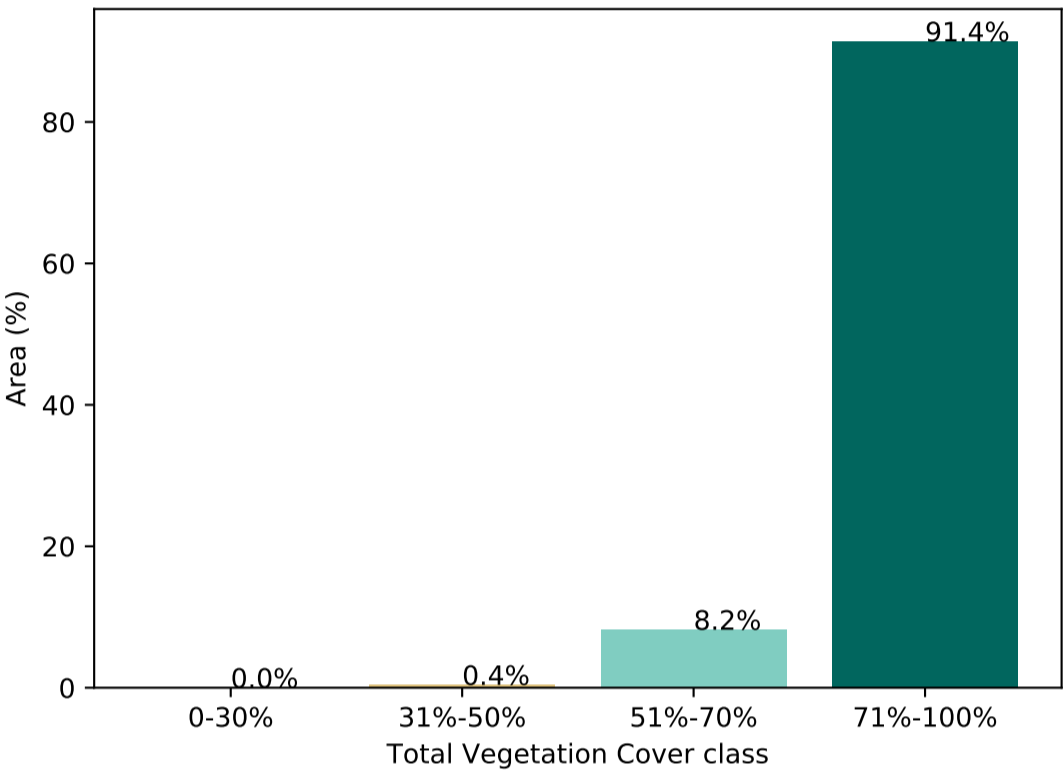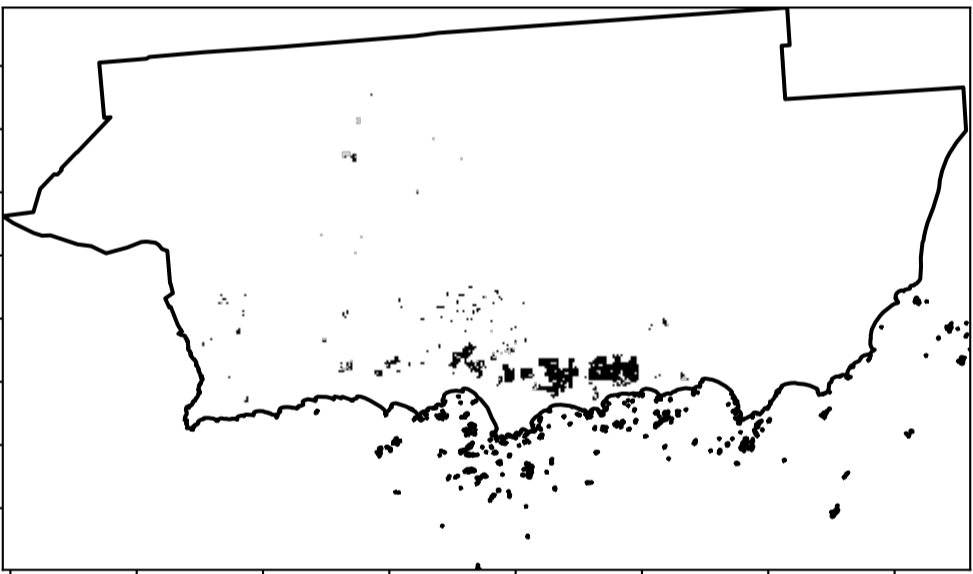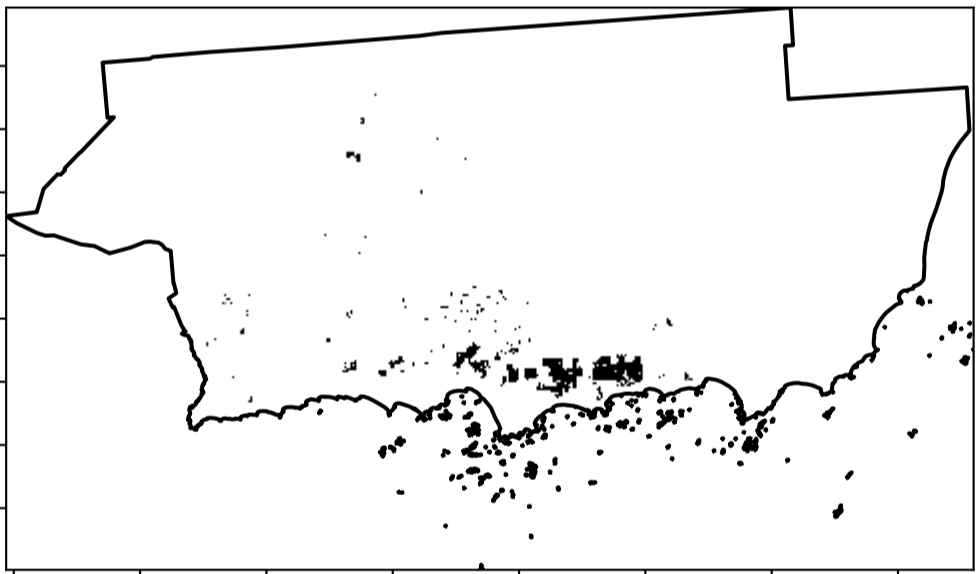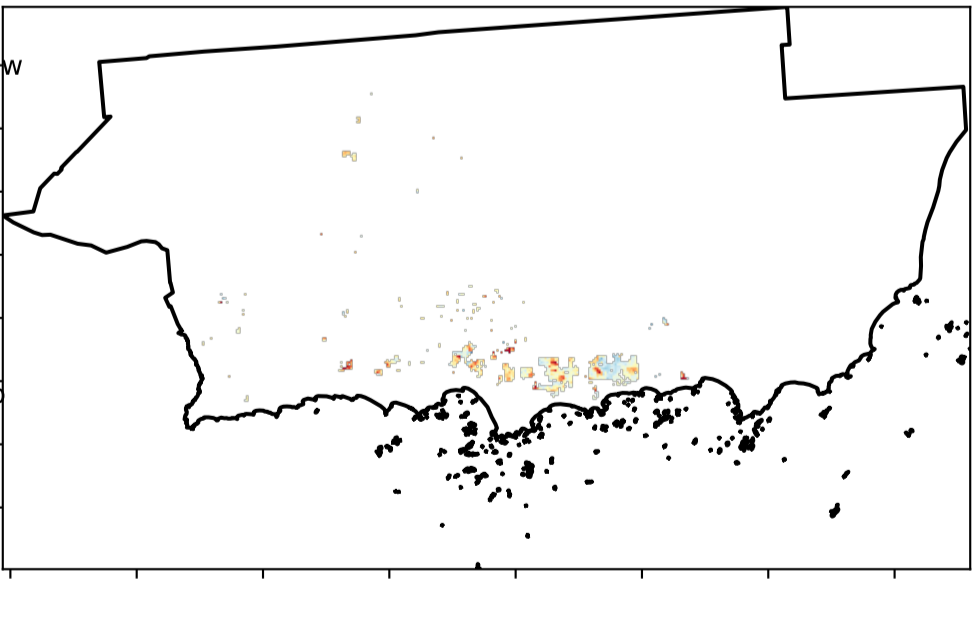the map using baseline
from 2001 to 2019.

10
8-9
4-7
2-3
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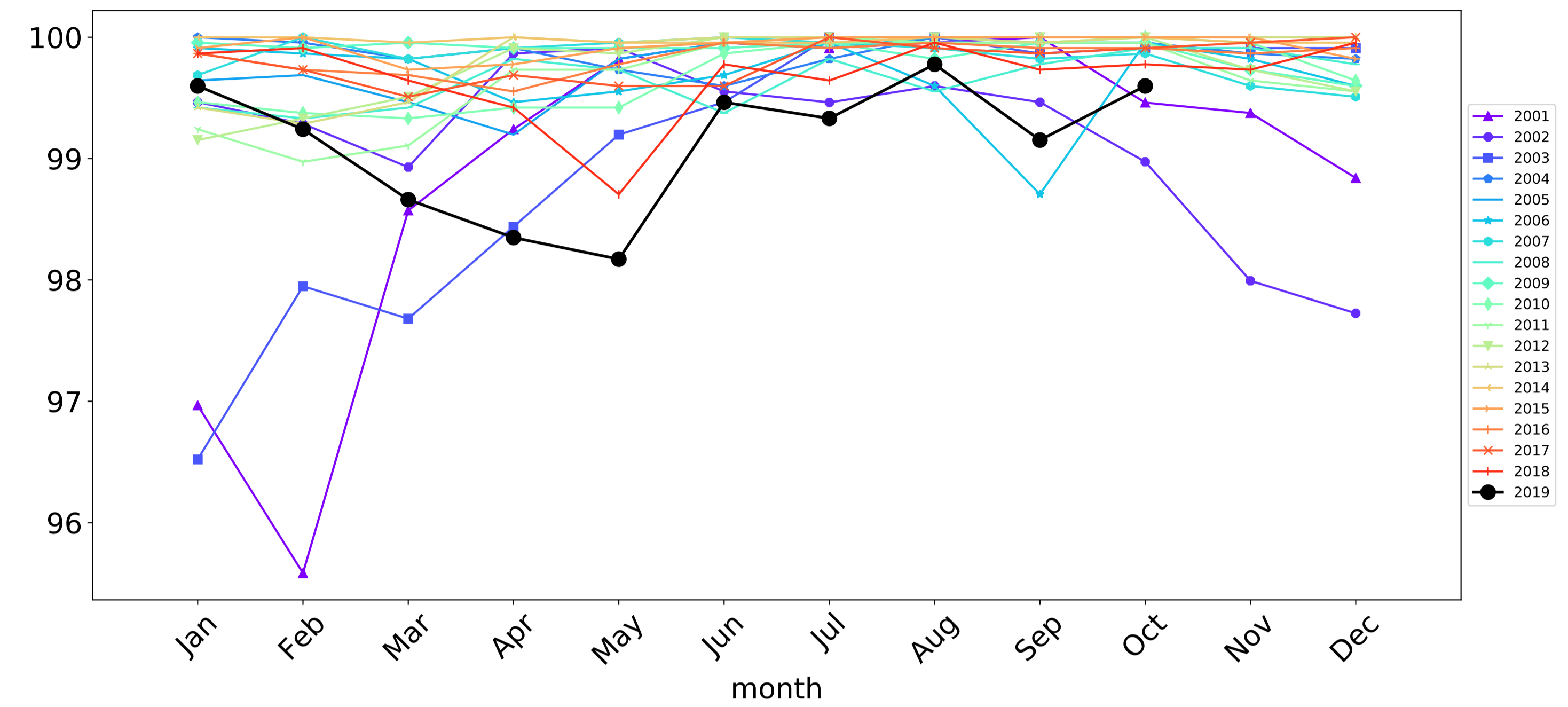# Production native forests and plantation forests timeseries
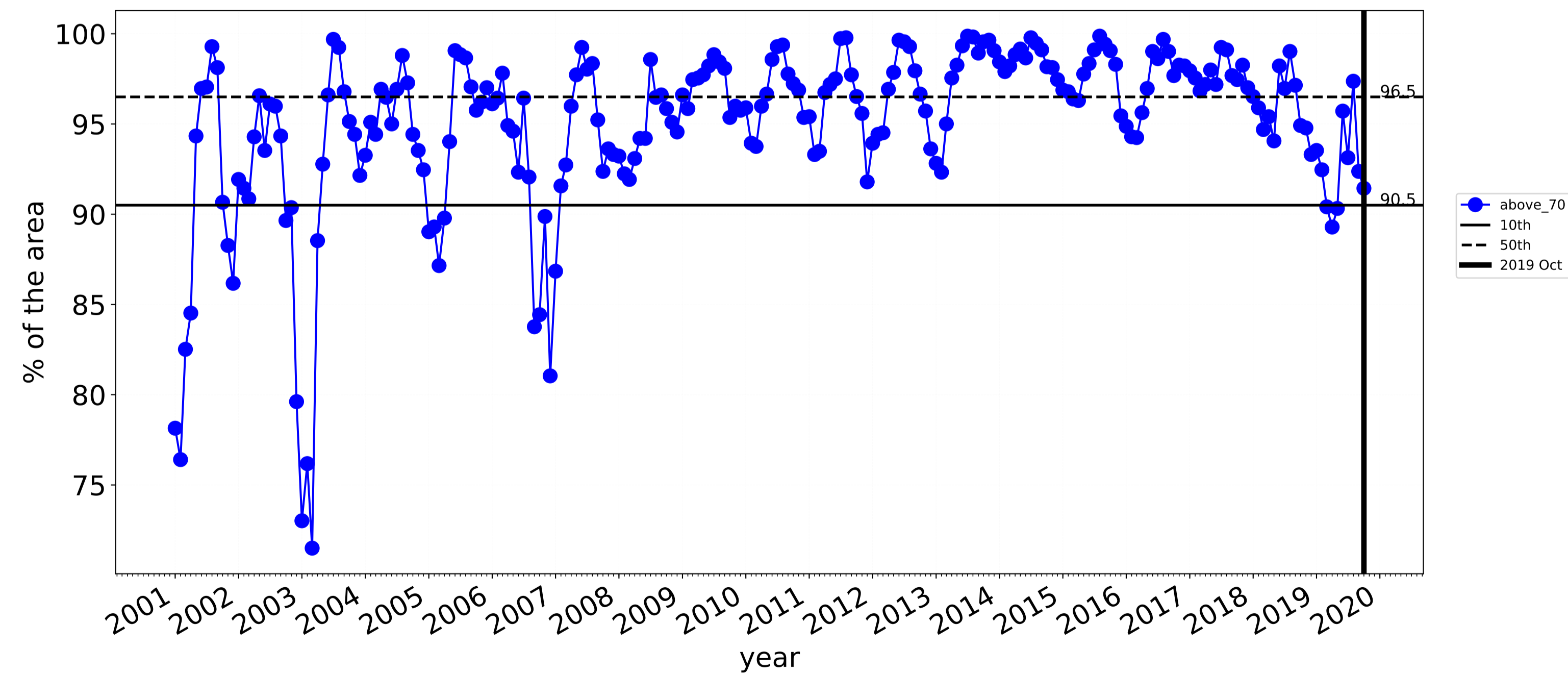

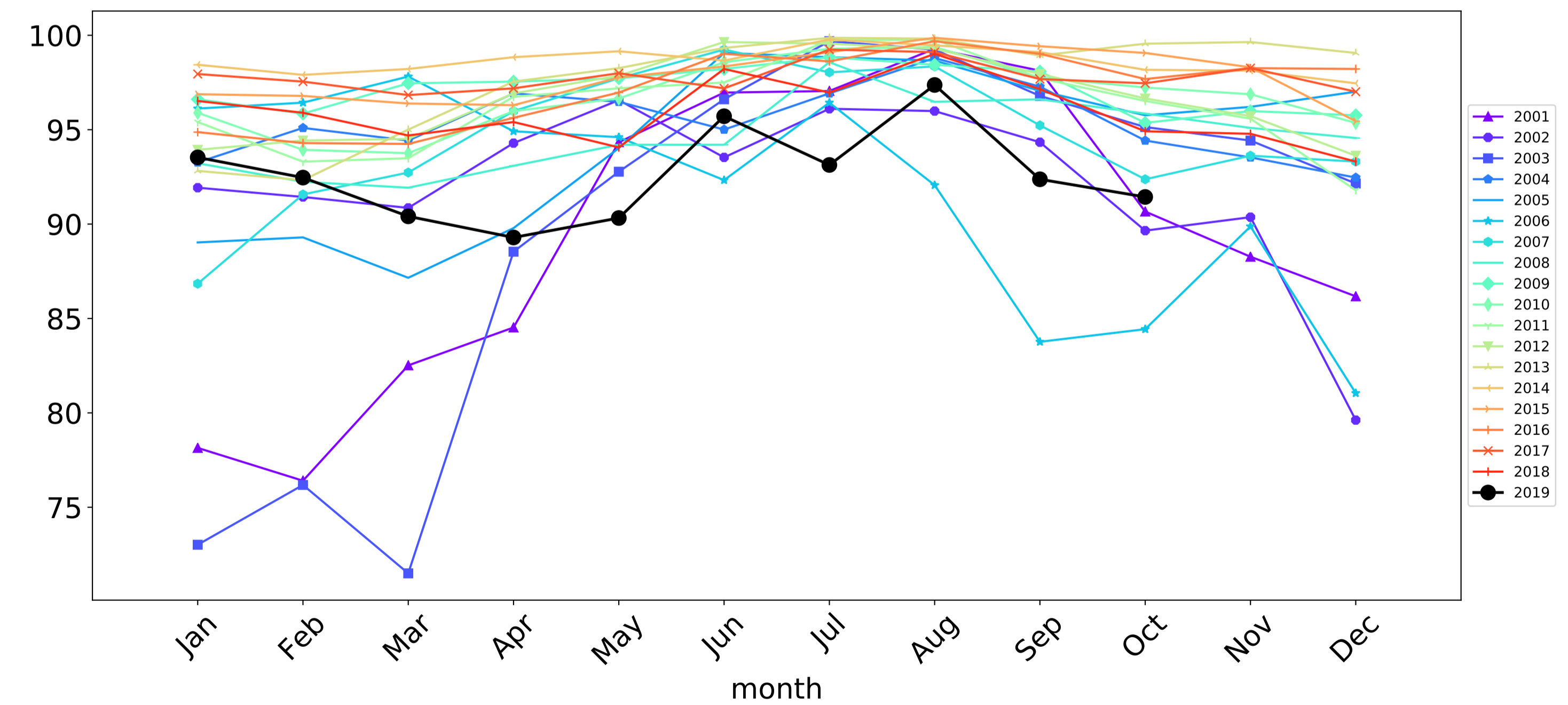Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)
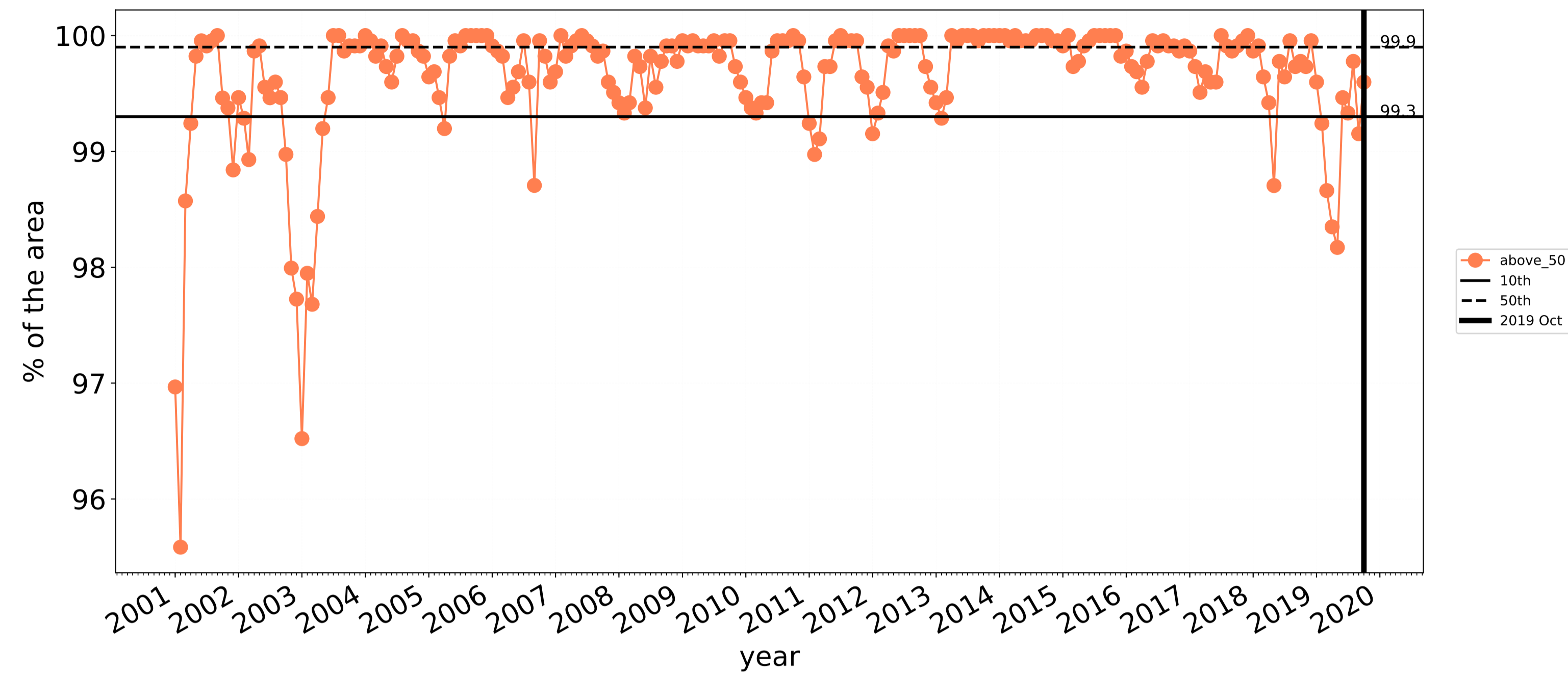
Wind erosion historical monthly area protected (Total Veg Cov >50%)

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

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

Esperance_(S) (4,401,250 ha and no data 76,650 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	4,401,250	99.0% 4,357,075	95.9% 4,221,475	78.8% 3,466,325	45.6% 2,006,950	5.6% 248,400	2.2% 97,400
Conservation and natural environments	3,021,250	98.6% 2,977,525	94.4% 2,851,300	82.6% 2,496,450	51.4% 1,551,775	4.0% 121,925	1.1% 33,950
Conservation and natural environments non forest	909,750	97.4% 886,350	94.2% 856,550	83.8% 762,450	47.4% 431,275	8.7% 78,875	2.6% 24,100
Conservation and natural environments Woodland forest	2,110,850	99.0% 2,090,525	94.5% 1,994,100	82.1% 1,733,375	53.1% 1,119,950	2.0% 42,975	0.5% 9,850
Agriculture	1,191,650	100.0% 1,191,575	99.4% 1,184,300	67.0% 798,575	26.6% 316,925	3.9% 46,725	0.8% 9,750
Grazing	193,150	100.0% 193,150	100.0% 193,150	90.5% 174,775	58.2% 112,350	12.7% 24,525	2.5% 4,775
Grazing non forest	190,650	100.0% 190,650	100.0% 190,650	90.4% 172,300	57.9% 110,350	12.6% 24,075	2.5% 4,750
Cropping	998,500	100.0% 998,425	99.3% 991,150	62.5% 623,800	20.5% 204,575	2.2% 22,200	0.5% 4,975
Production native forests and plantation forests	56,050	100.0% 56,025	99.6% 55,825	91.4% 51,250	71.8% 40,250	26.2% 14,675	0.9% 500