# Total vegetation cover soil protection
## Region:LGA Woodanilling_(S) WA                    Date: January 2022

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
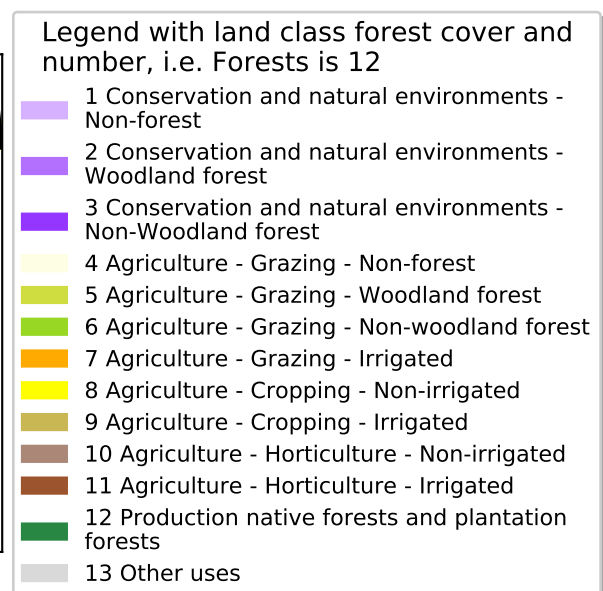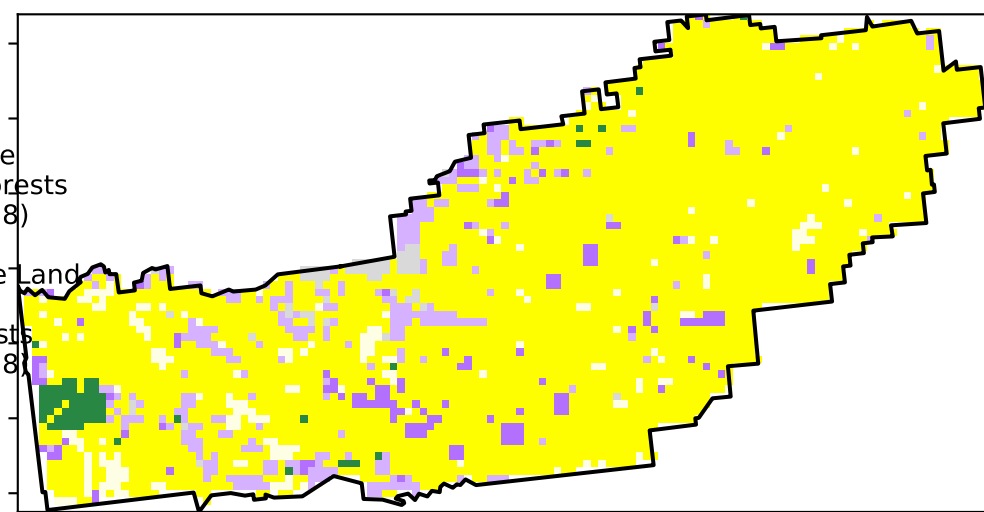
4. MODIS Fractional cover algorithm:
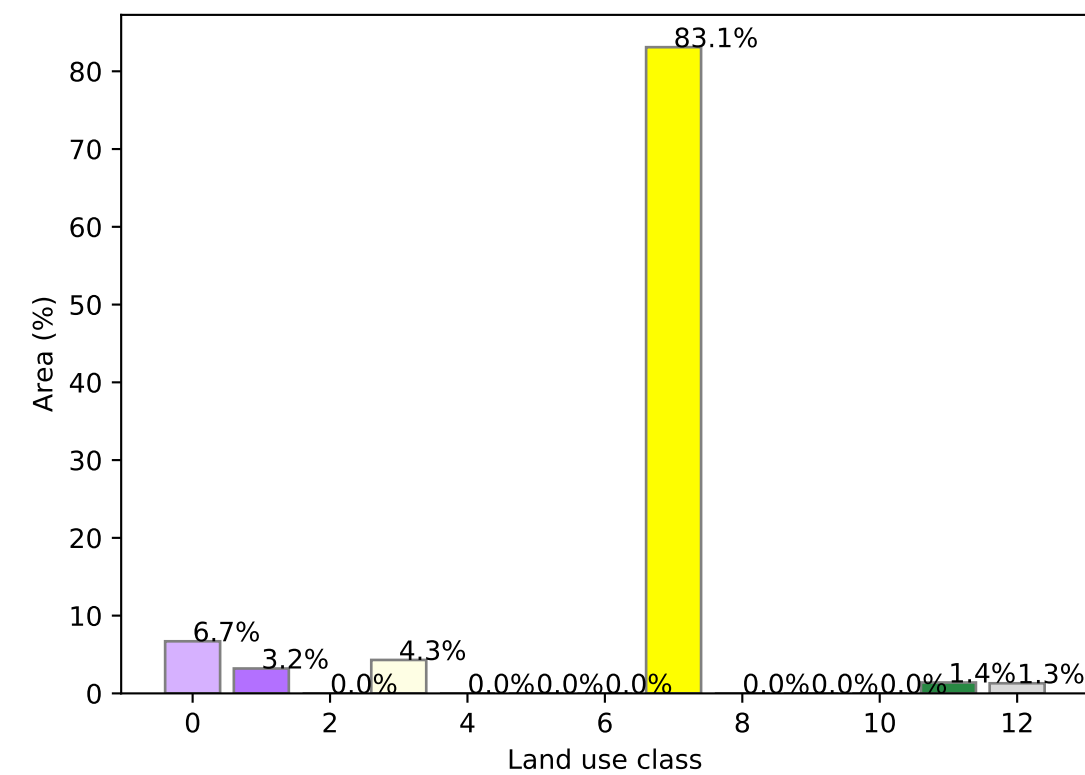
    https://doi.org/10.4225/08/5848a3f19a7b3
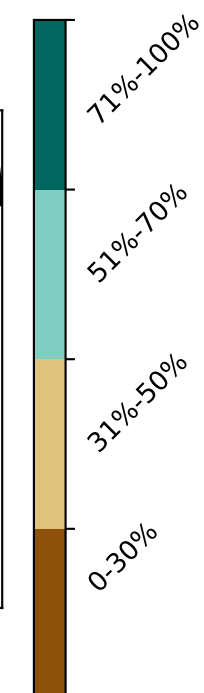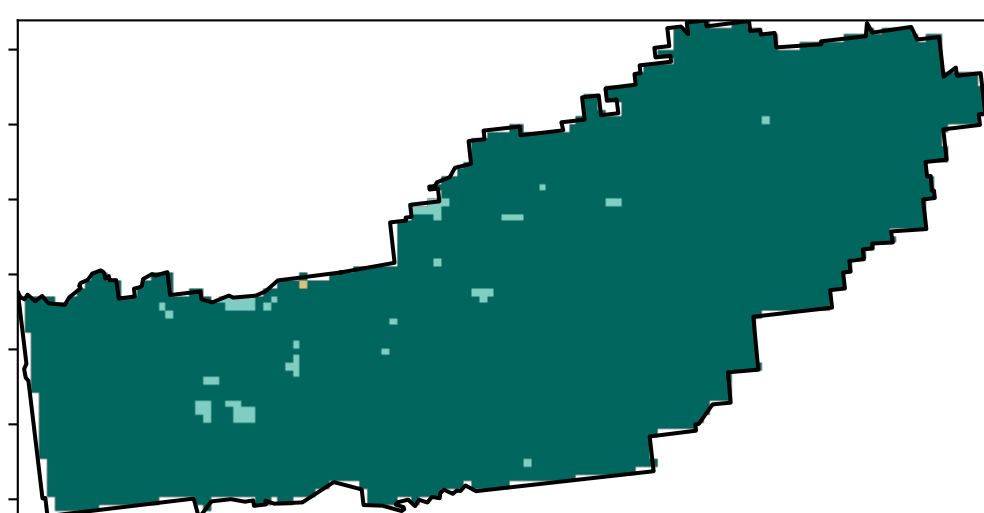
# Vegetation Cover Jan 2022

## 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
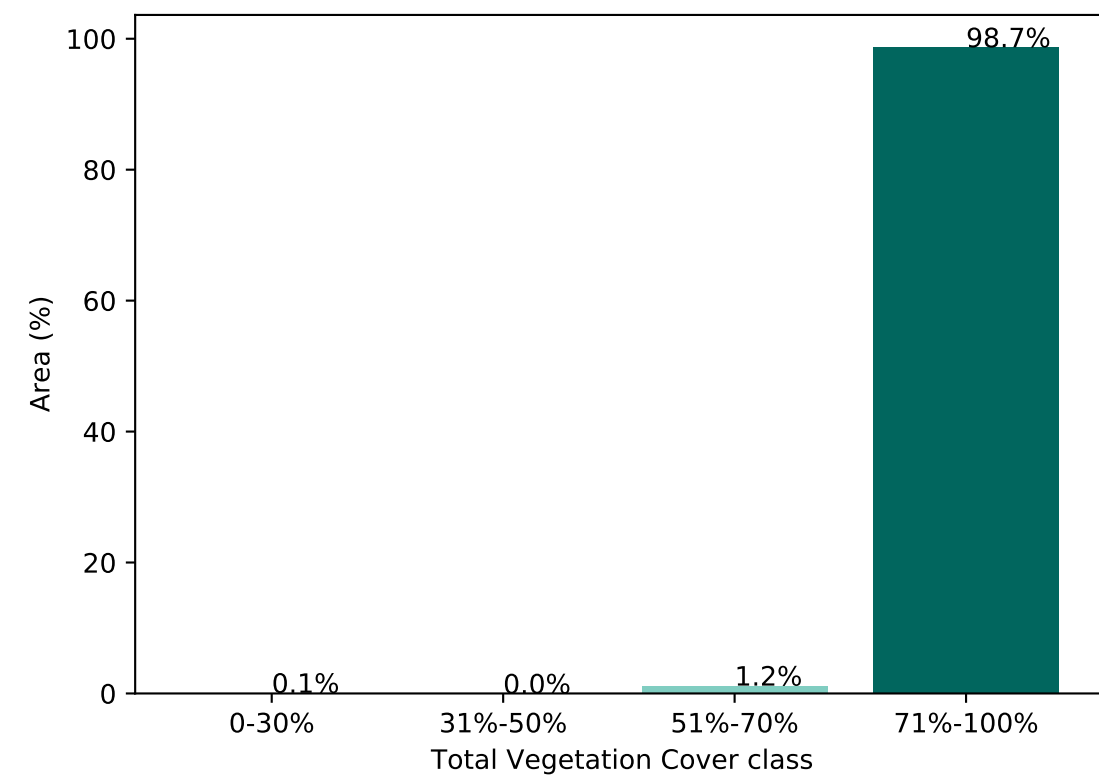
Legend with land class forest cover and number, i.e. Forests is 12
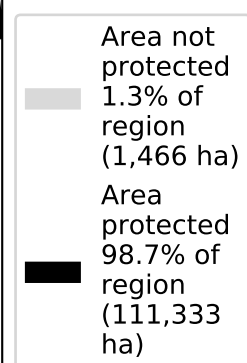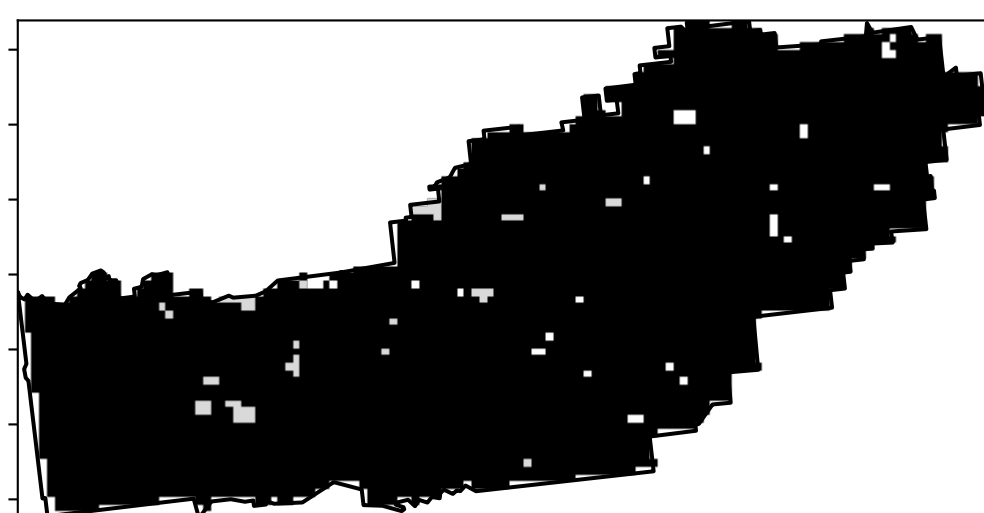
- 1 Conservation and natural environments - Non-forest
- 2 Conservation and natural environments - Woodland forest
- 3 Conservation and natural environments - Non-Woodland forest
- 4 Agriculture - Grazing - Non-forest
- 5 Agriculture - Grazing - Woodland forest
- 6 Agriculture - Grazing - Non-woodland 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

Area (%) vs Land use class

6.7%, 3.2%, 0.0%, 4.3%, 0.0% 0.0% 0.0%, 83.1%, 0.0% 0.0% 0.0%, 1.4% 1.3%

## 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%: 0.1%
31%-50%: 0.0%
51%-70%: 1.2%
71%-100%: 98.7%

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

Area not protected 1.3% of region (1,466 ha)

Area protected 98.7% of region (111,333 ha)

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

Area not protected 0.0% of region (0 ha)
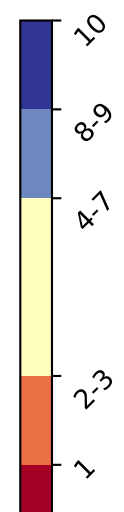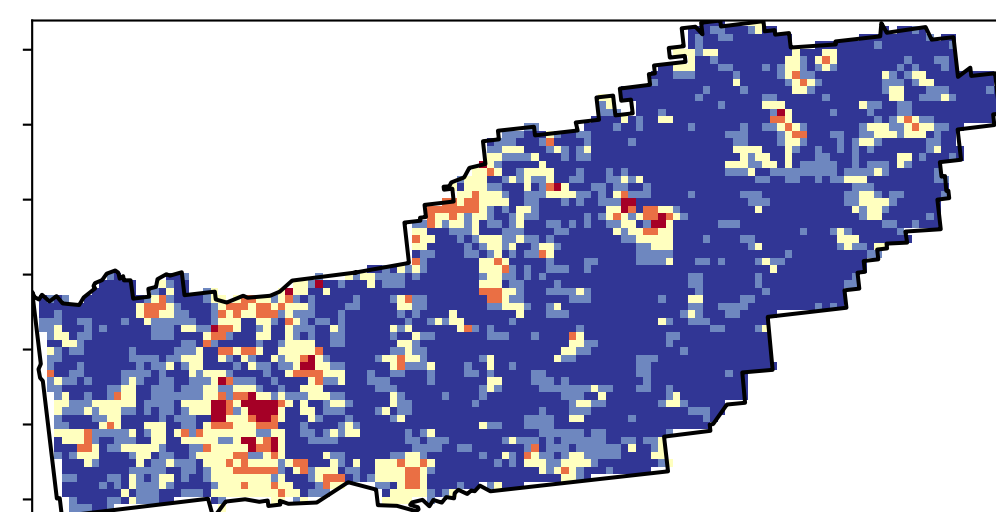
Area protected 100.0% of region (112,800 ha)

## 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
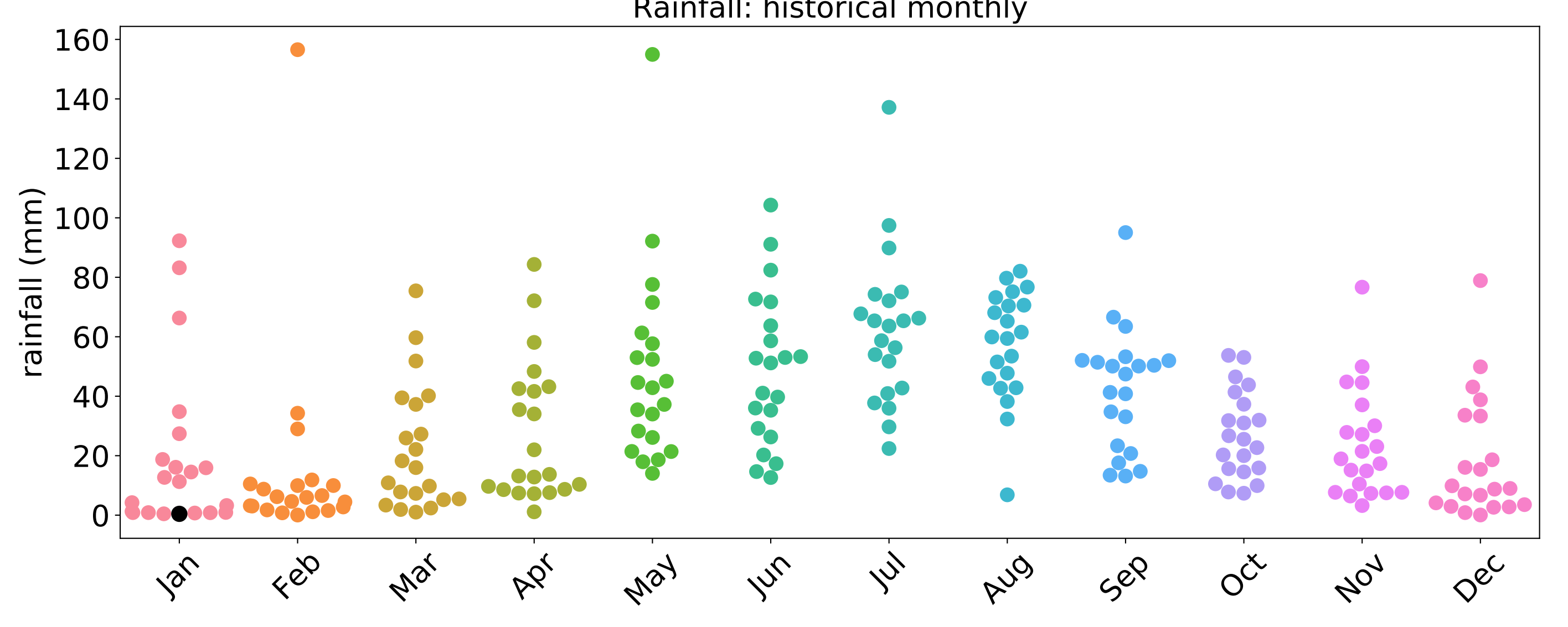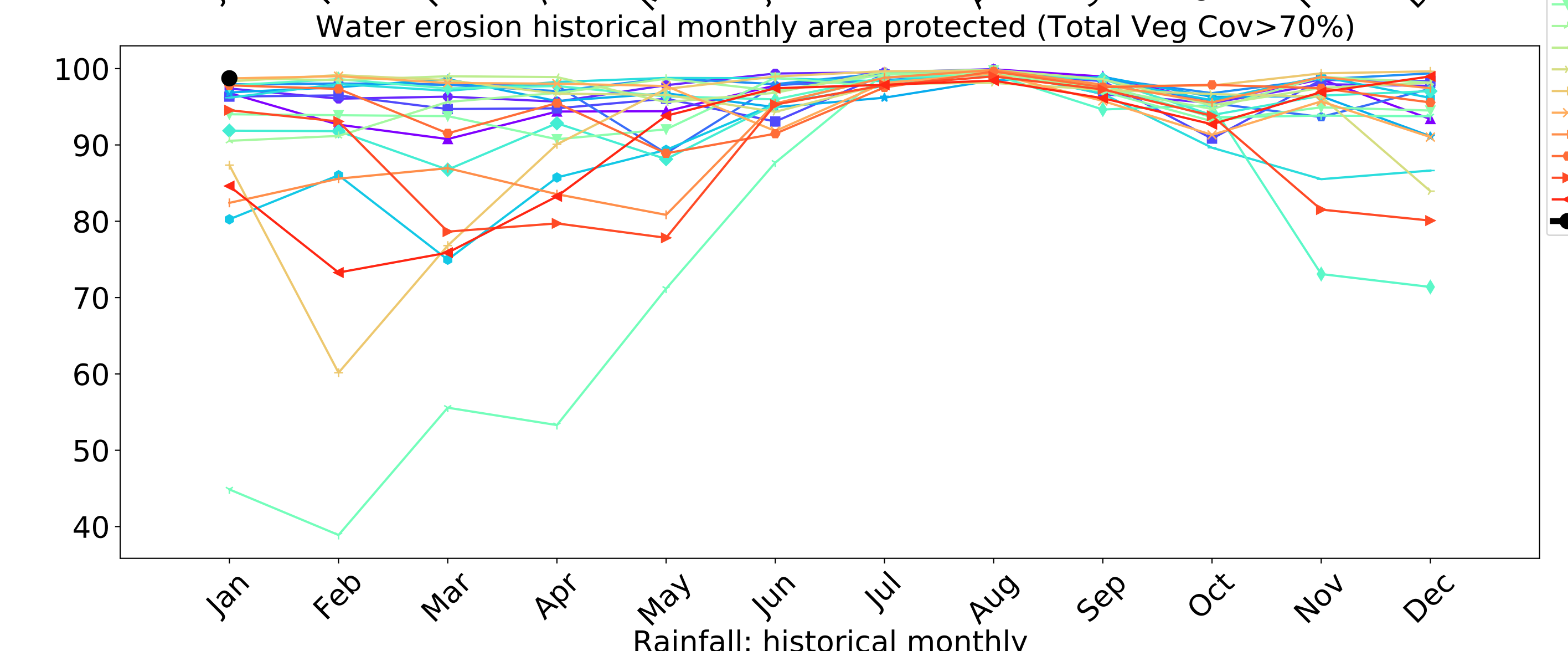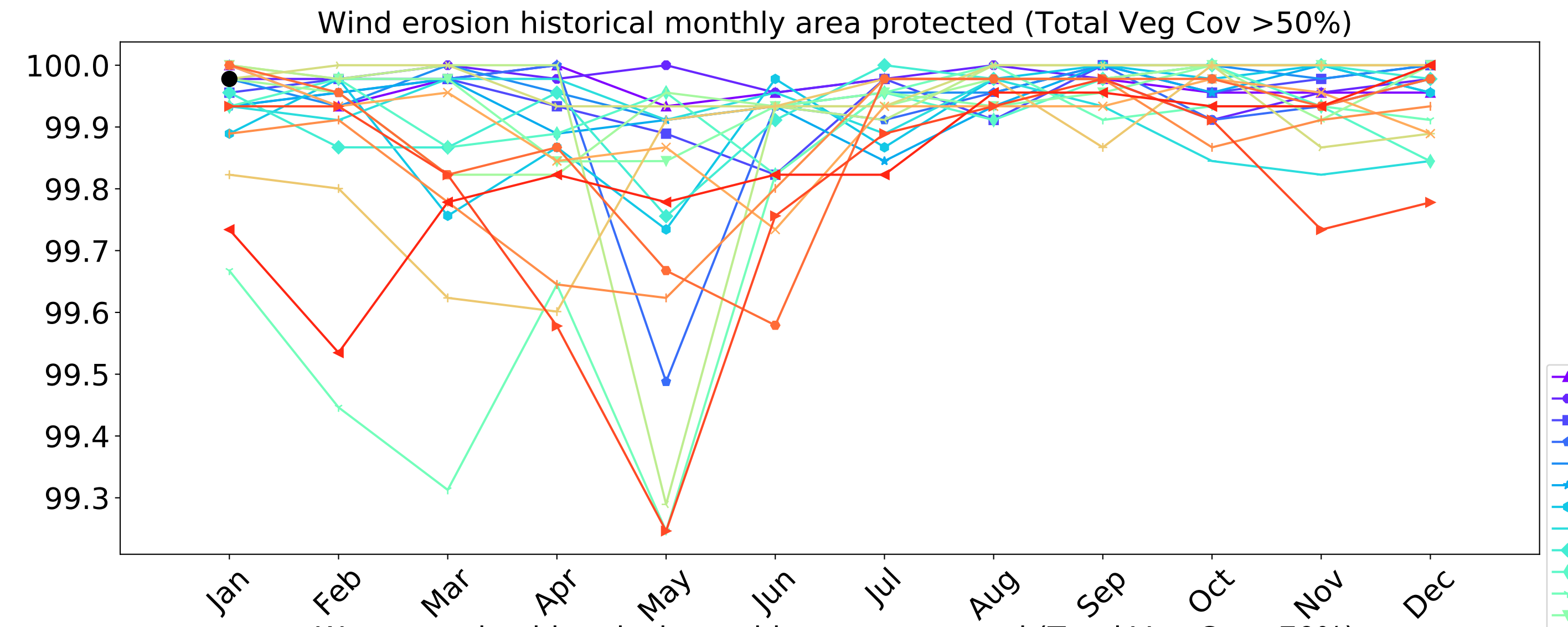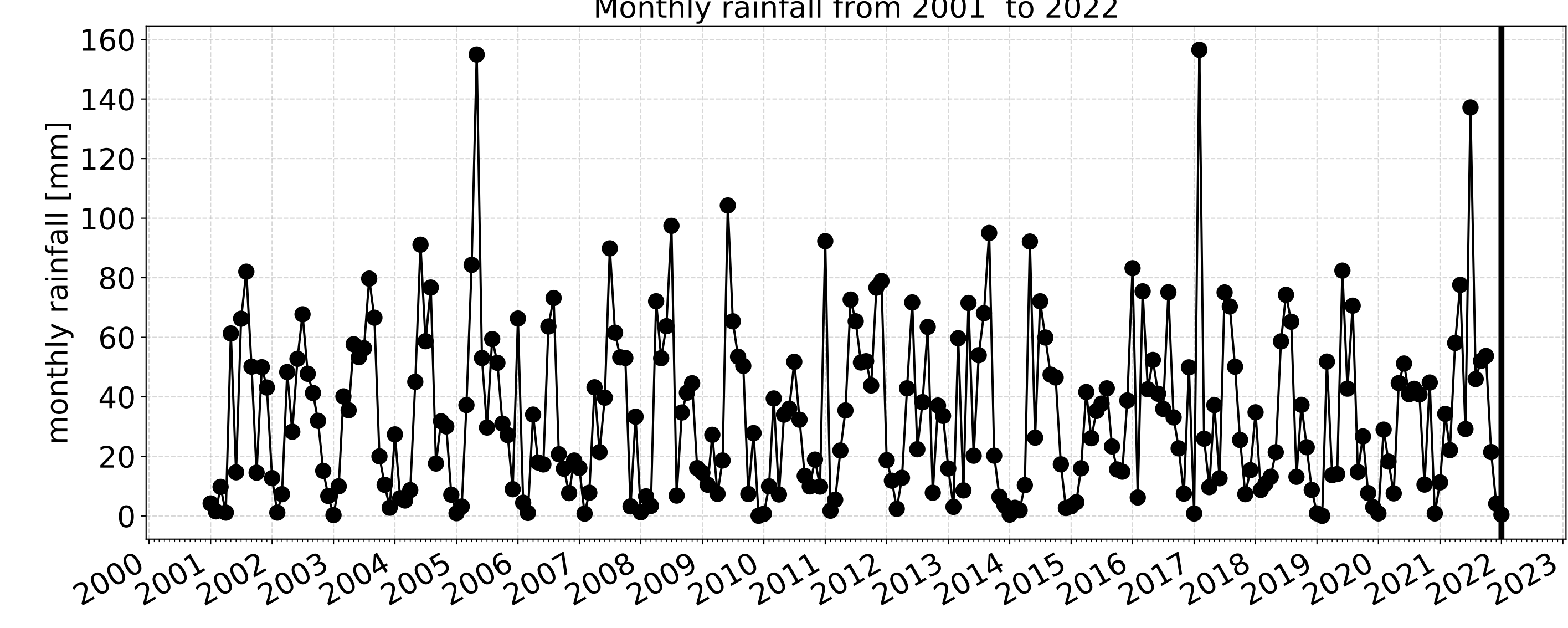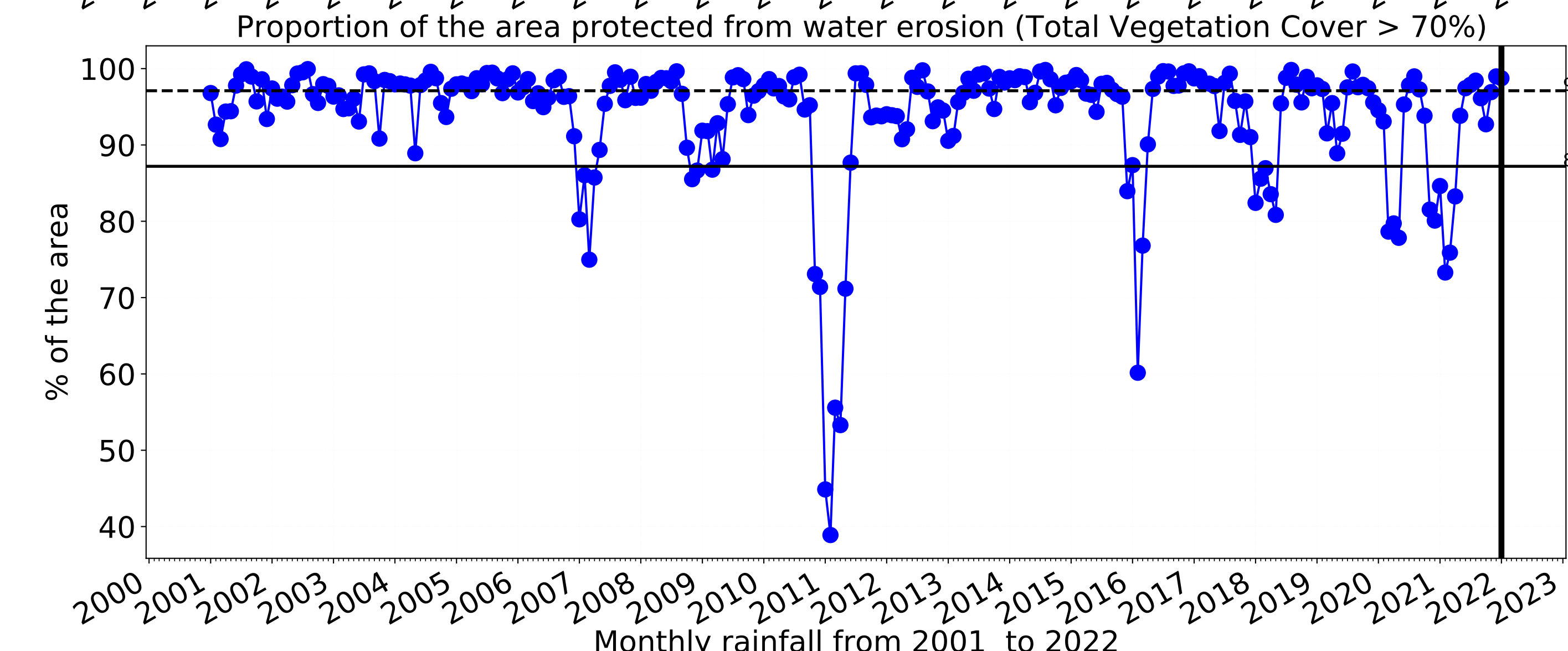tern Ecosystem Research Infrastructure
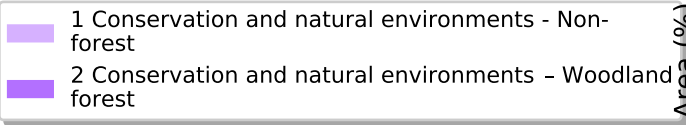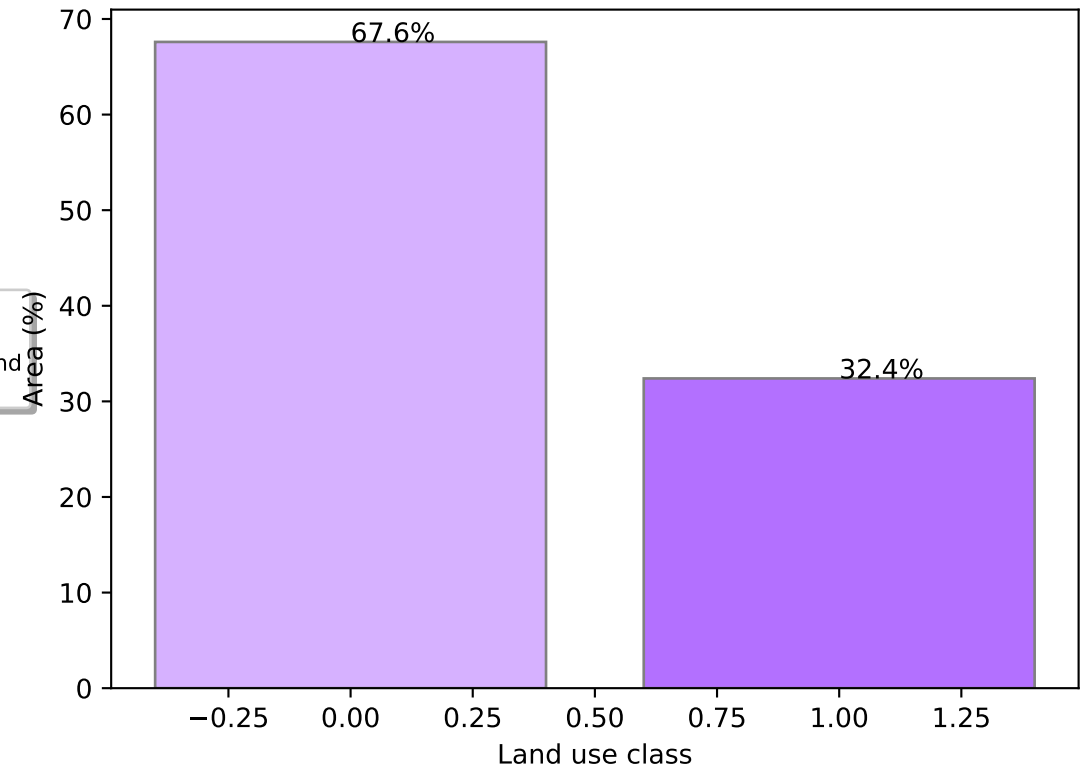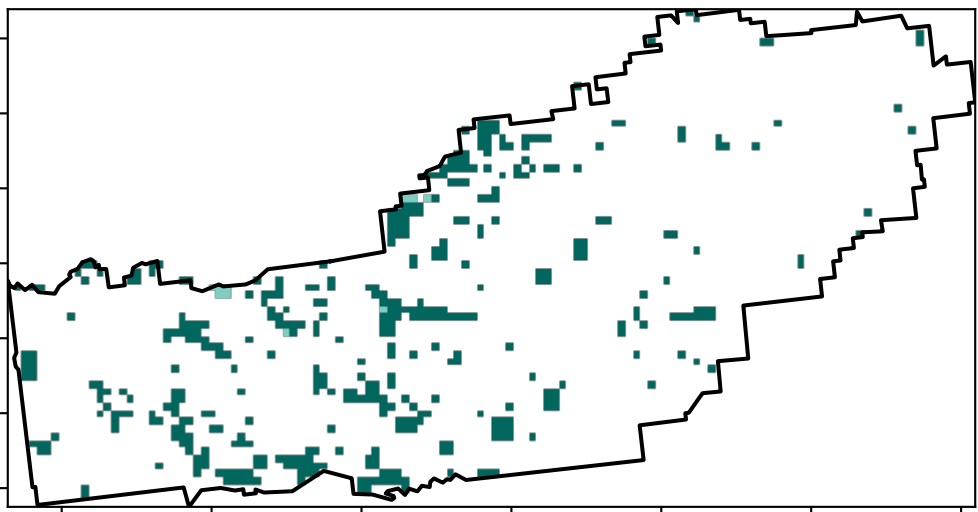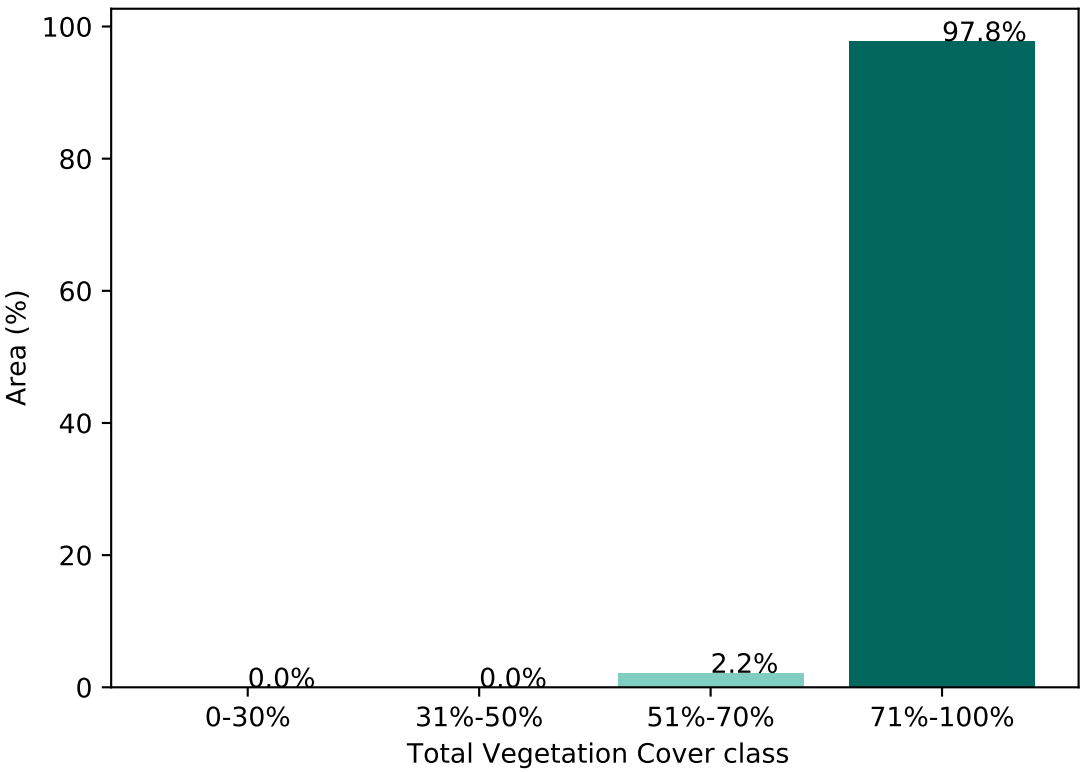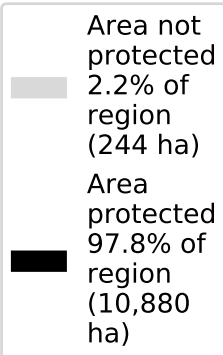Australian Government
National Landcare Programme
NSW GOVERNMENT

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 2022

Rainfall: historical monthly

3

# 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
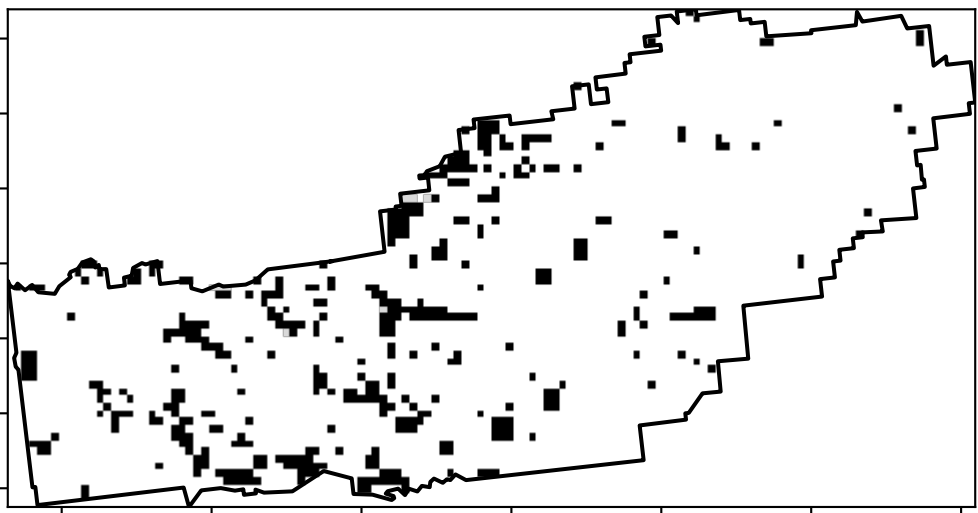(2018) and Forests
of Australia (2018)

1 Conservation and natural environments - Non-forest
2 Conservation and natural environments – Woodland forest

## Proportion of each land class in area

67.6%

32.4%

Land use class

## Total Vegetation Cover [%]

71%-100%

51%-70%

31%-50%

0-30%

## Proportion of vegetation cover class in area

97.8%

0.0%    0.0%    2.2%

Total Vegetation Cover class

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

Area not
protected
2.2% of
region
(244 ha)

Area
protected
97.8% of
region
(10,880
ha)
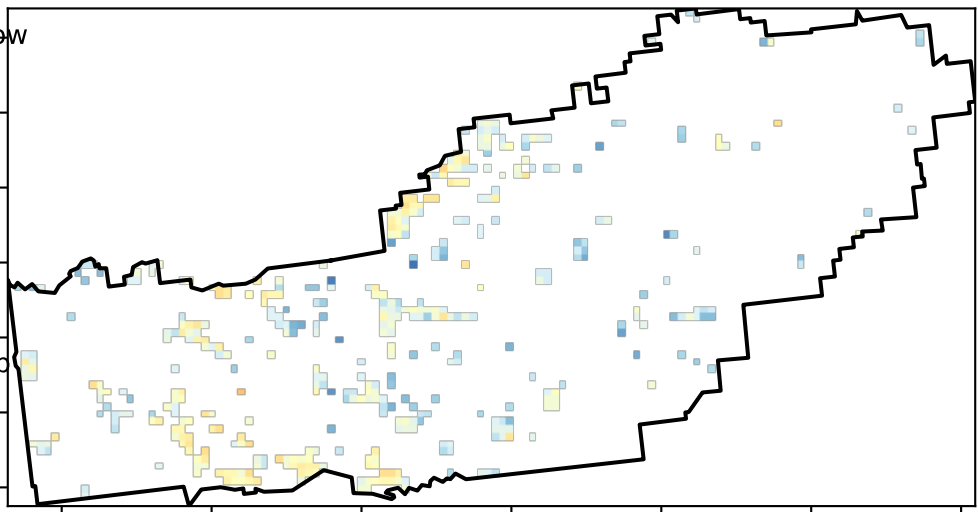
## % Area protected from wind erosion (>50%)
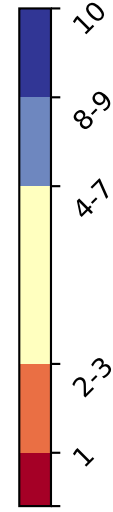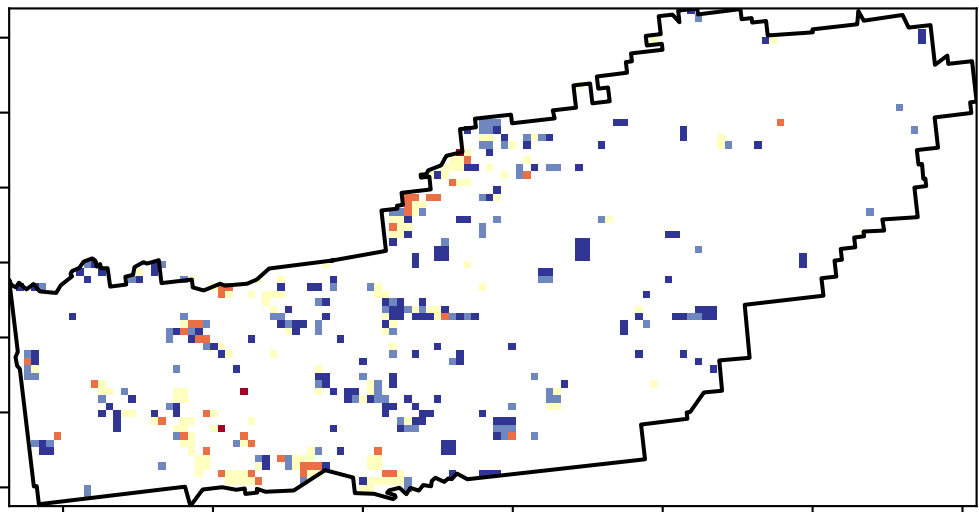
Area
protected
100.0% of
region
(11,125
ha)

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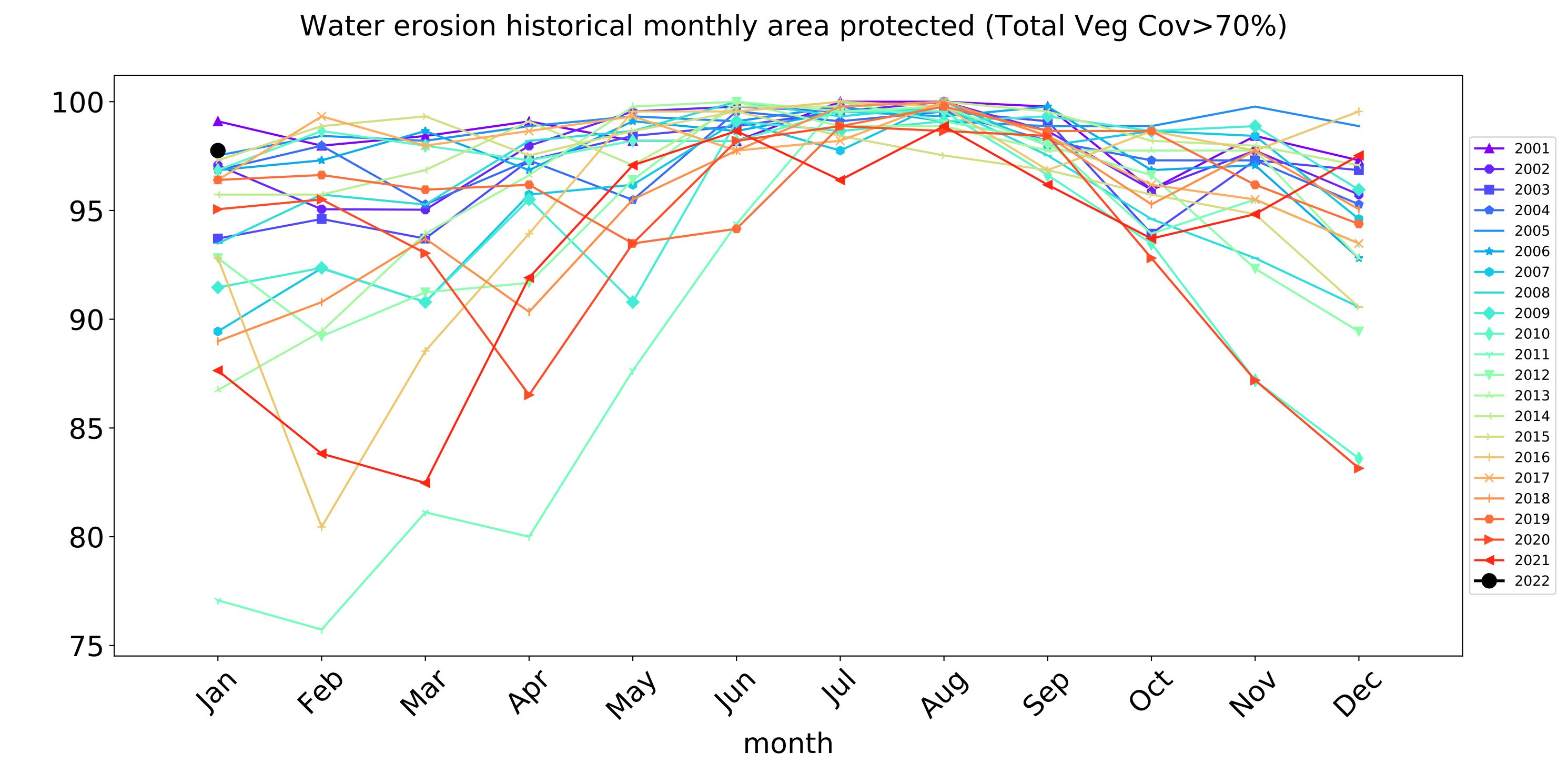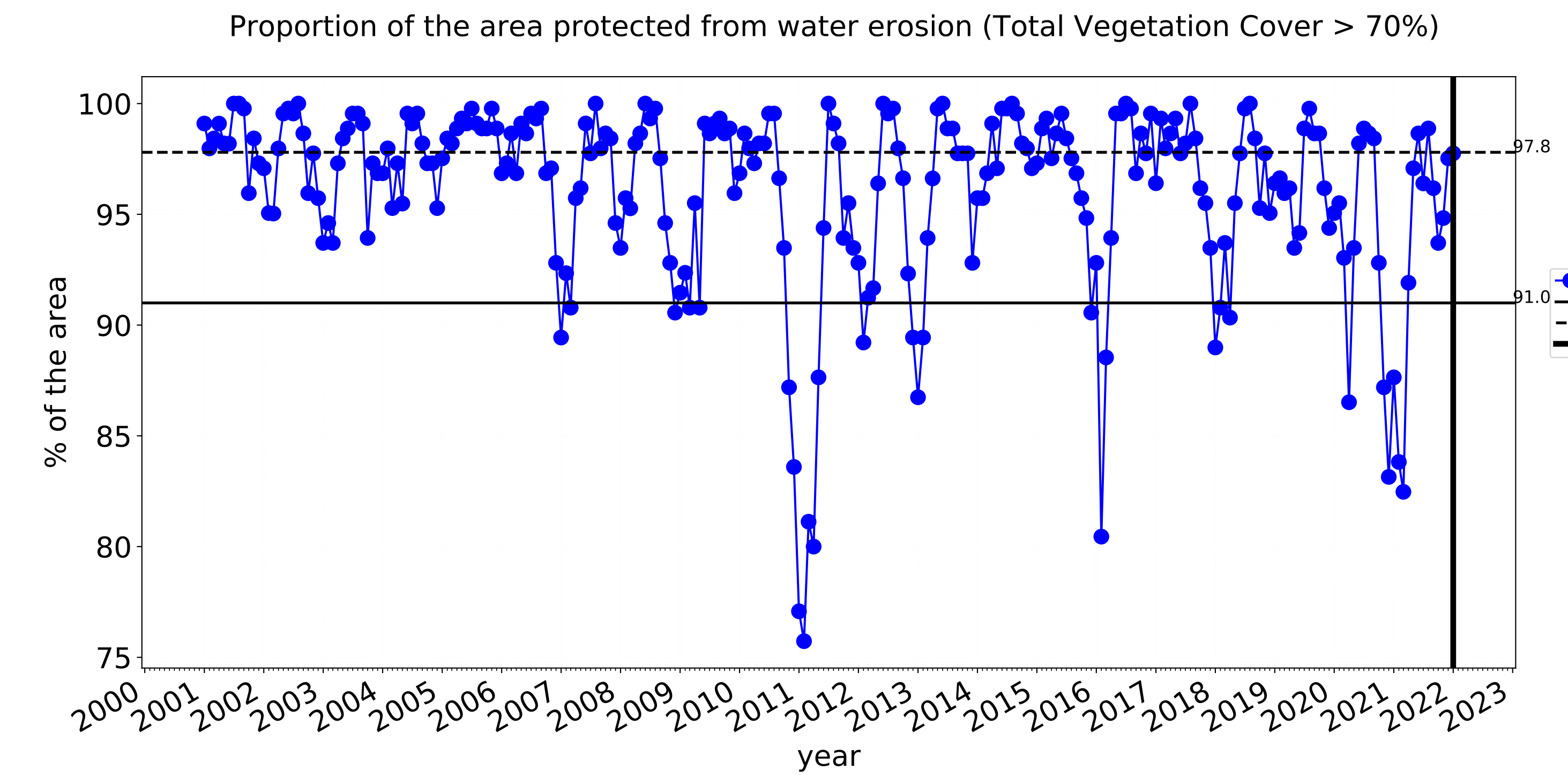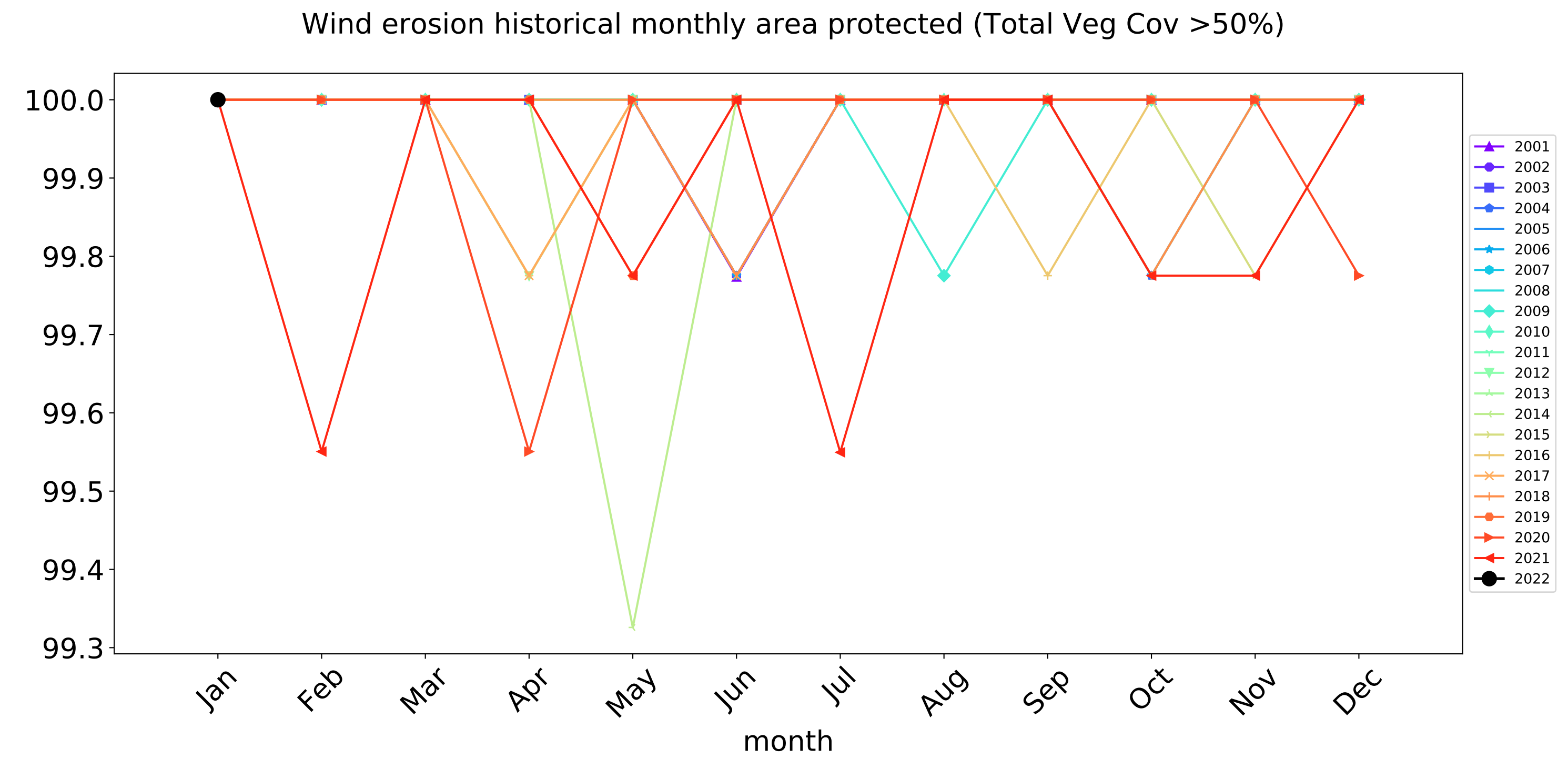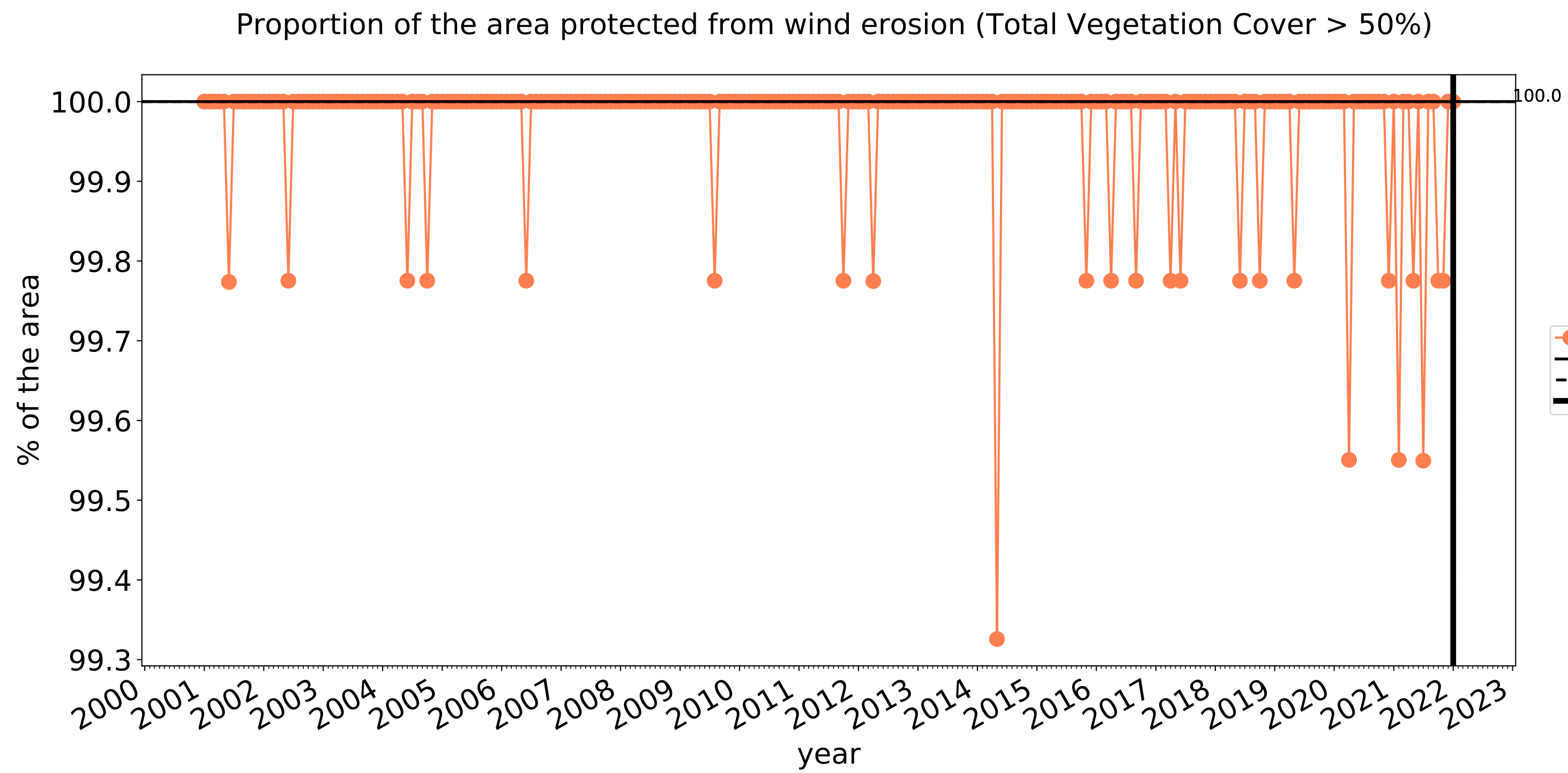records for that month
of the map using baseline
from 2001 to 2019.

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
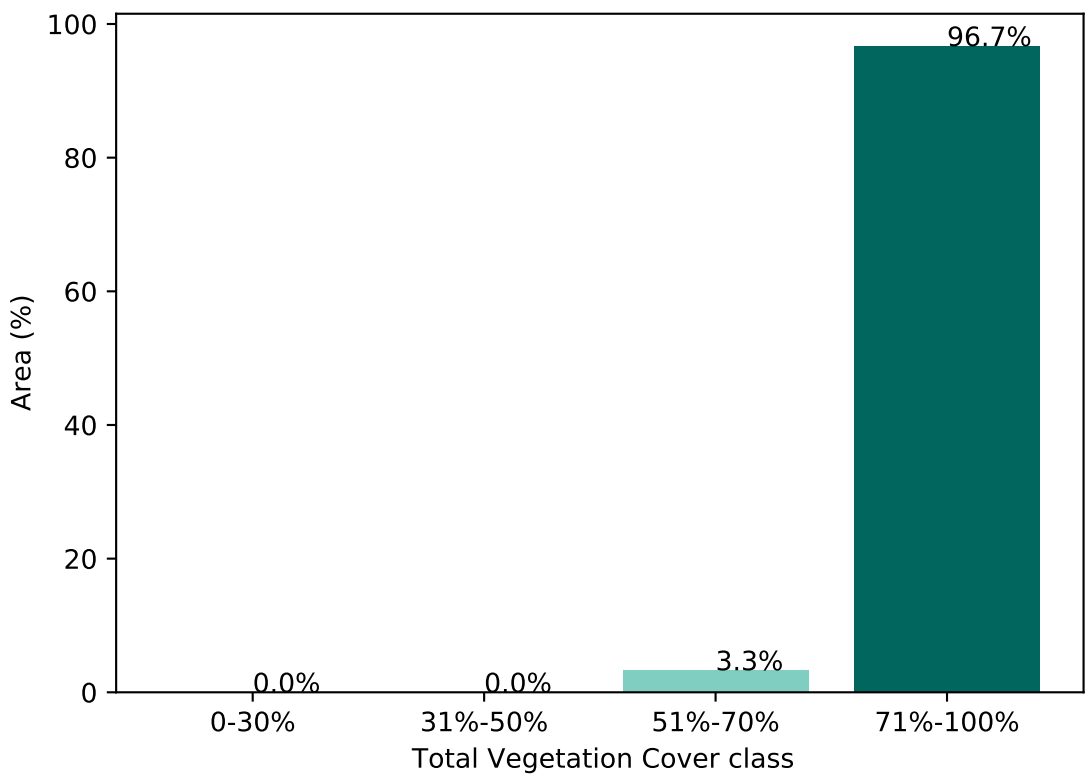(2018) and Forests
of Australia (2018)

1 Conservation and natural environments - Non-forest

## Total Vegetation Cover [%]
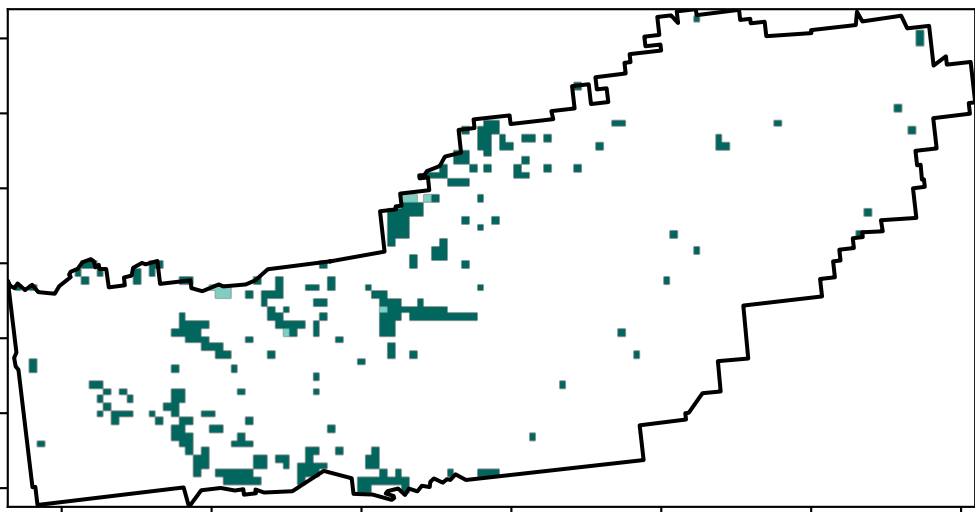
71%-100%

51%-70%

31%-50%

0-30%

## Proportion of vegetation cover class in area

96.7%

0.0%        0.0%        3.3%

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

Total Vegetation Cover class

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

Area not
protected
3.3% of
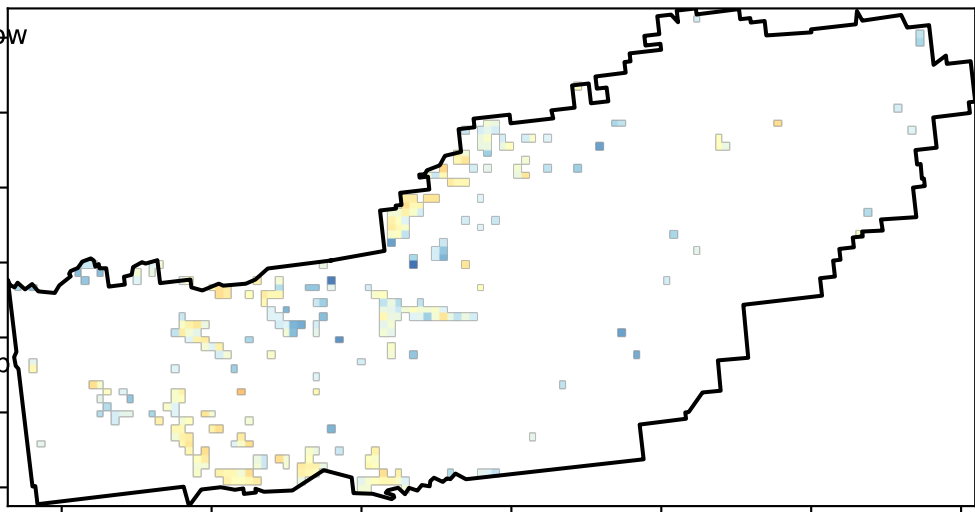region
(248 ha)
Area
protected
96.7% of
region
(7,276 ha)

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

Area
protected
100.0% of
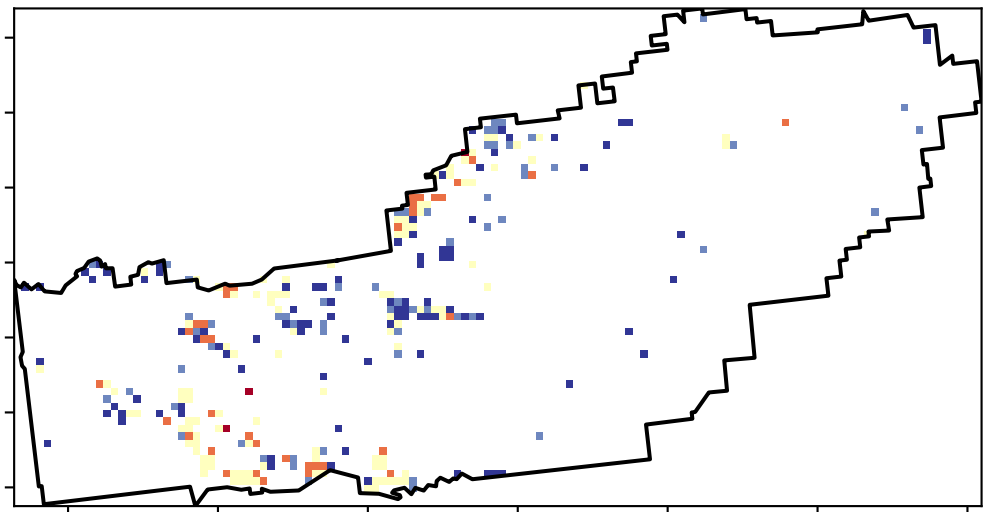region
(7,525 ha)

## 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
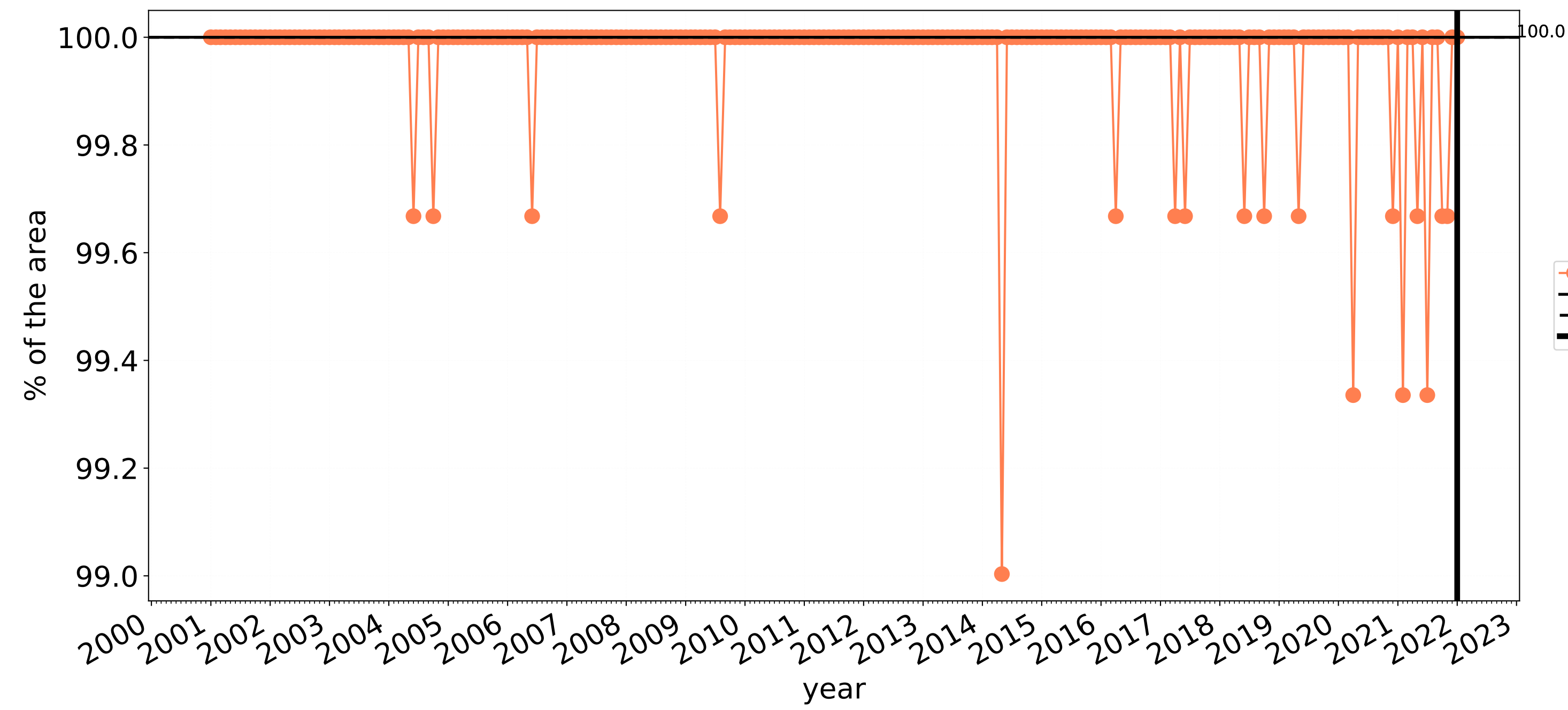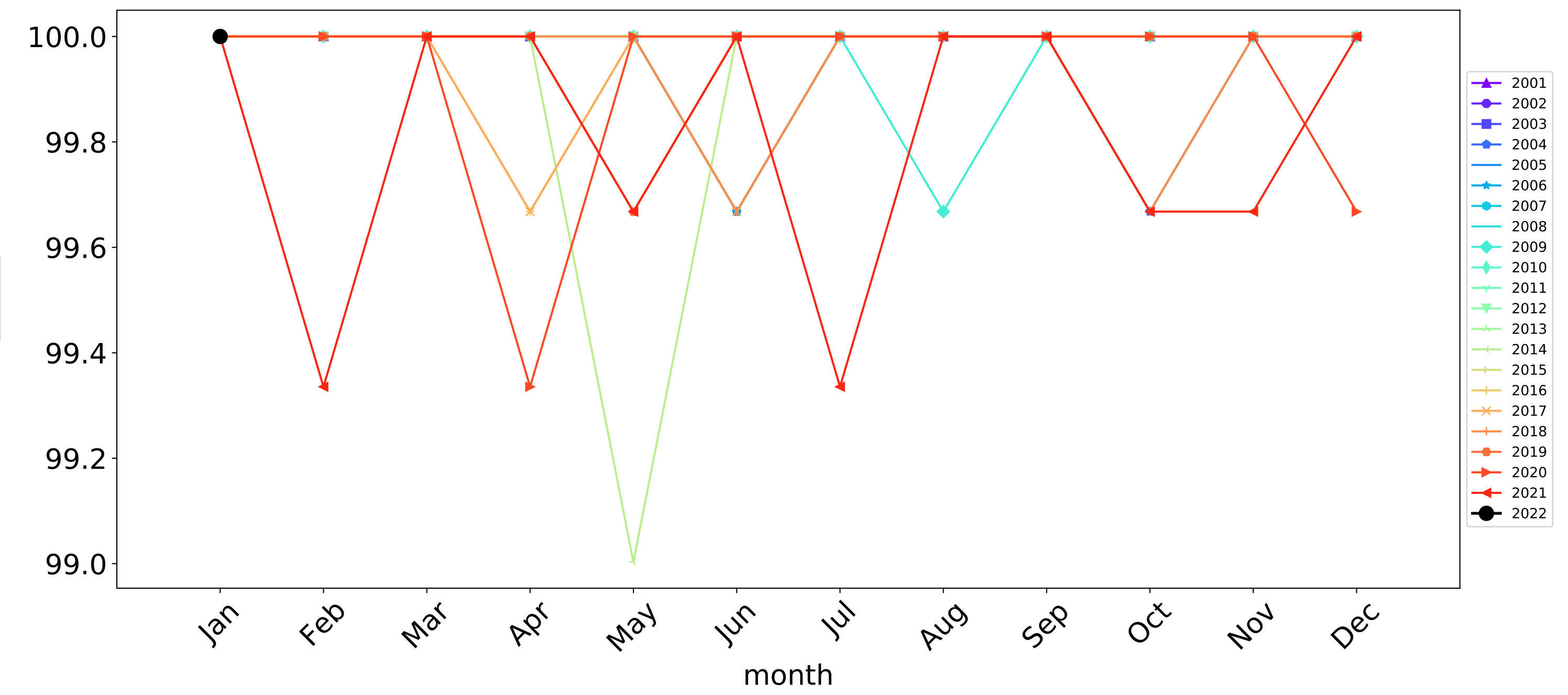
1

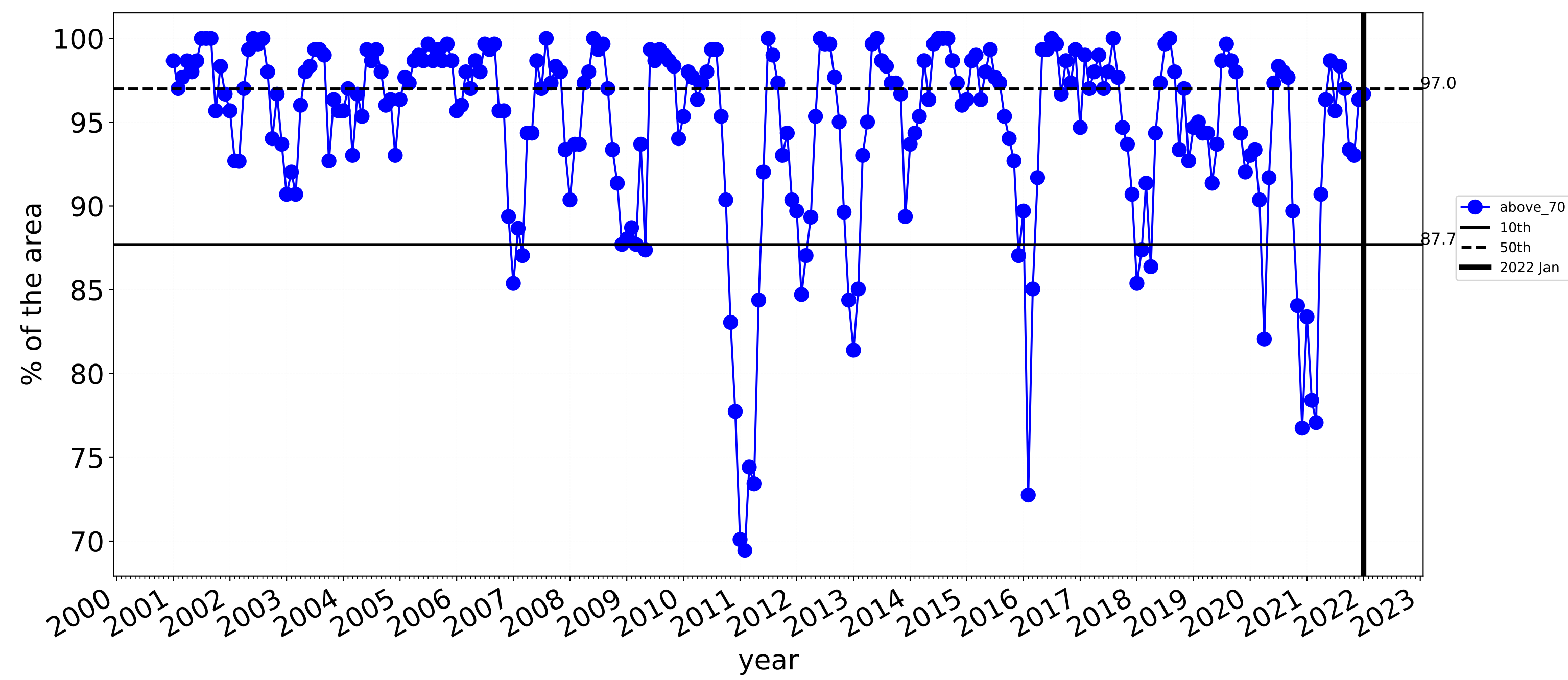# Conservation and natural environments non forest timeseries

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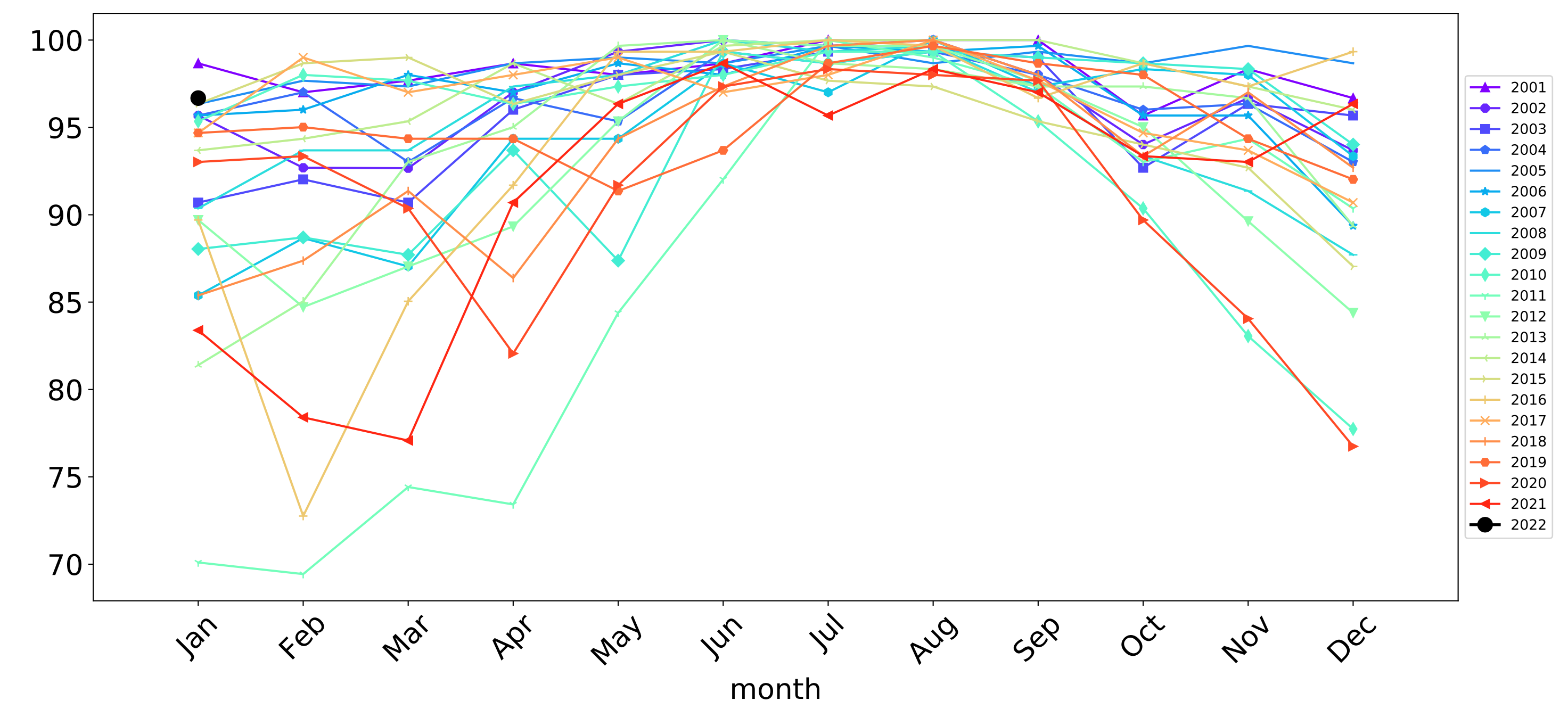


### Wind erosion historical monthly area protected (Total Veg Cov >50%)



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



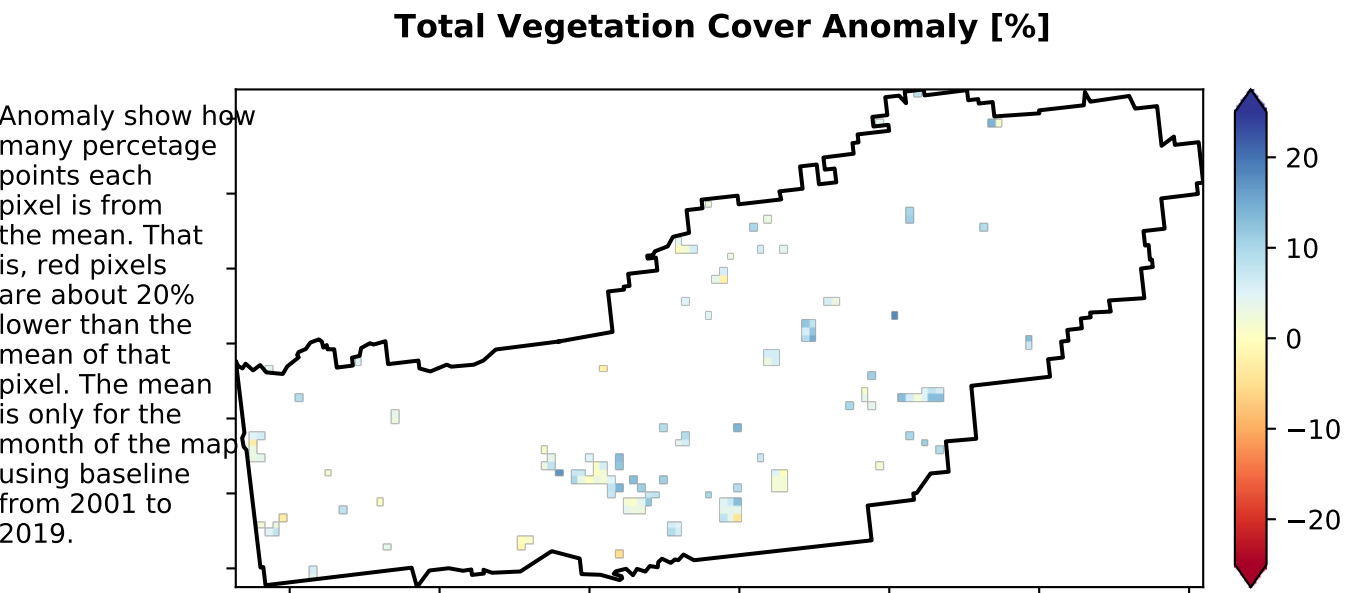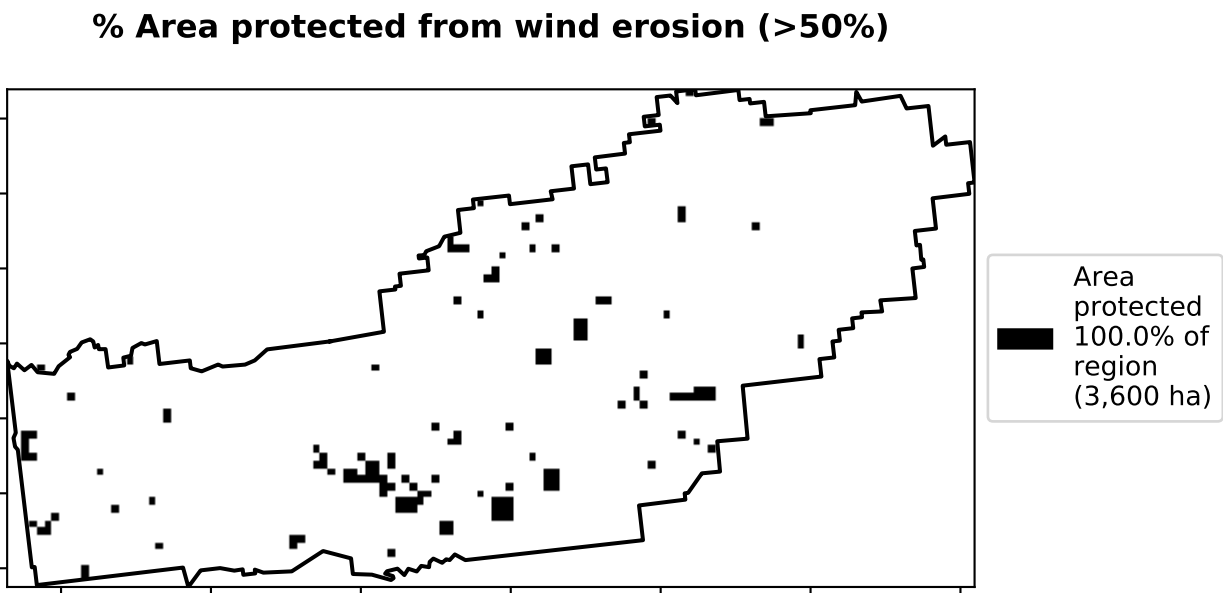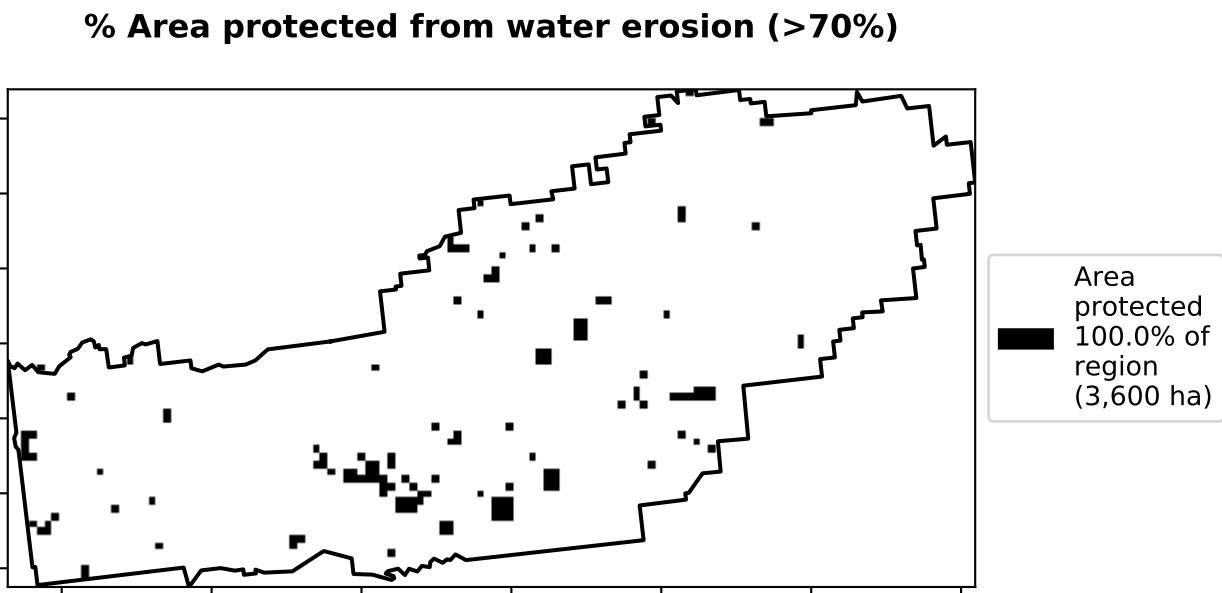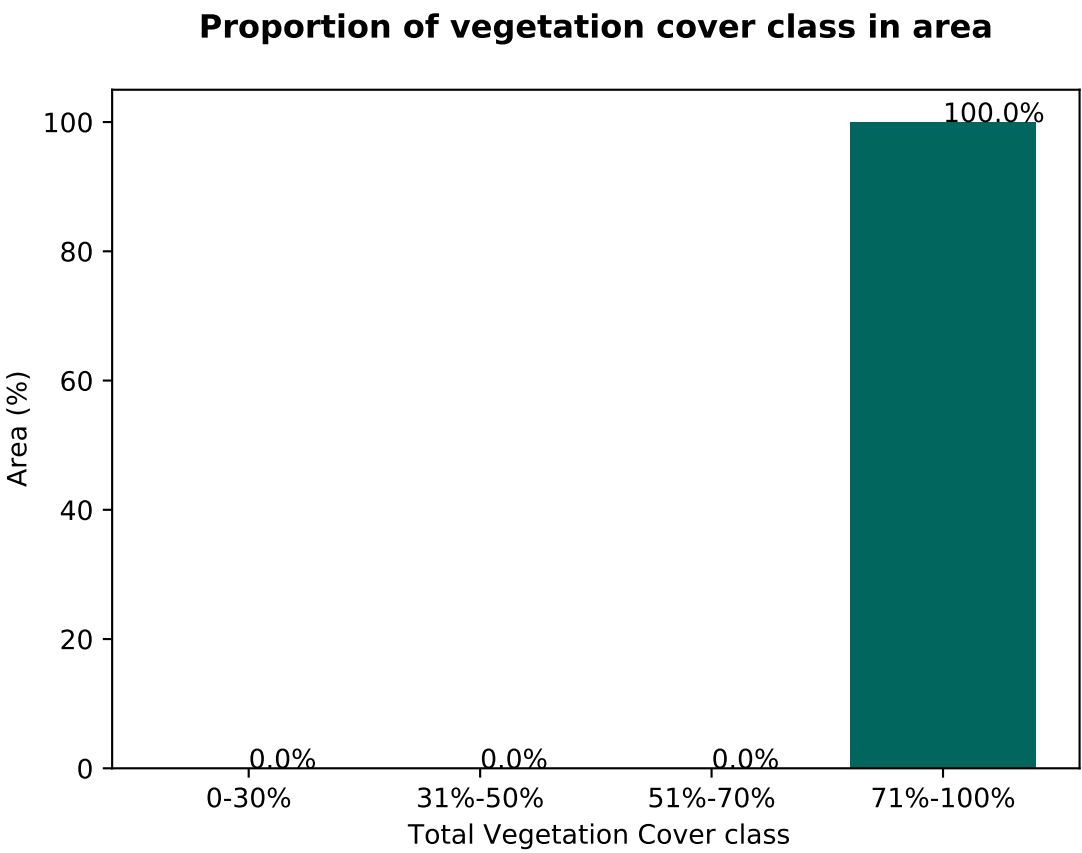### Water erosion historical monthly area protected (Total Veg Cov>70%)

# 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)

1 Conservation and natural environments – Woodland forest

### Total Vegetation Cover [%]

71%-100%

51%-70%

31%-50%

0-30%

### Proportion of vegetation cover class in area

100.0%

0.0%    0.0%    0.0%

Total Vegetation Cover class

Area (%)

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

Area protected
100.0% of
region
(3,600 ha)

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

Area protected
100.0% of
region
(3,600 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.

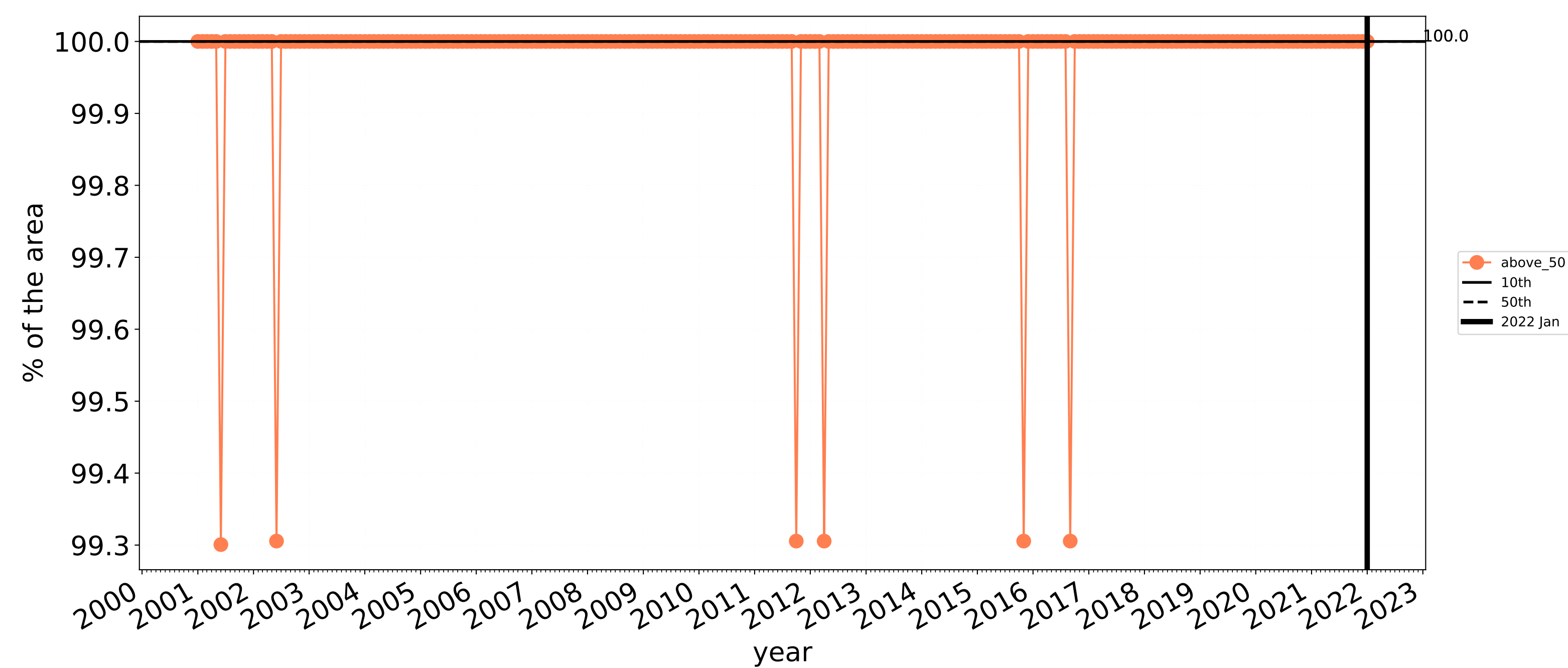### Total Vegetation Cover Decile [%]

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
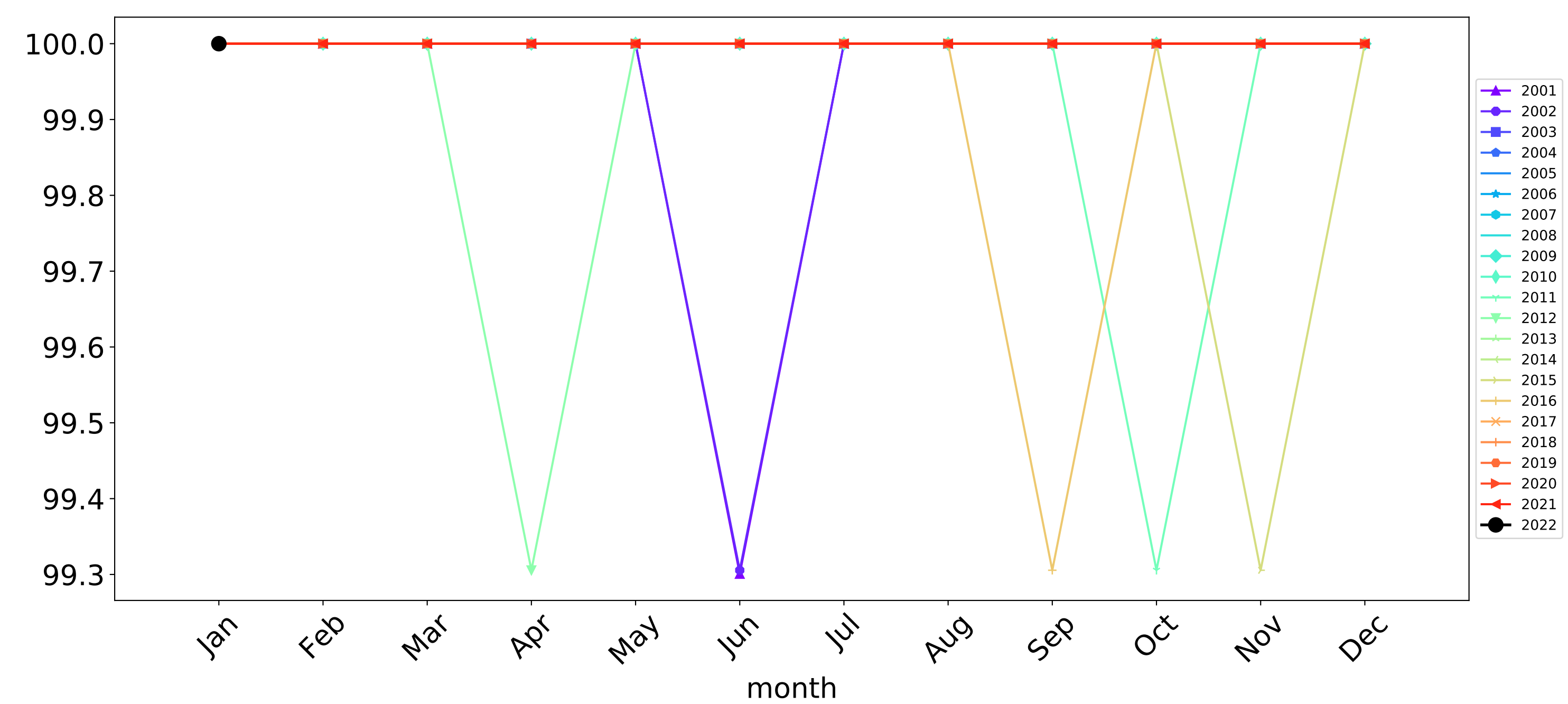the map using baseline
from 2001 to 2019.

10

8-9

4-7

2-3

1

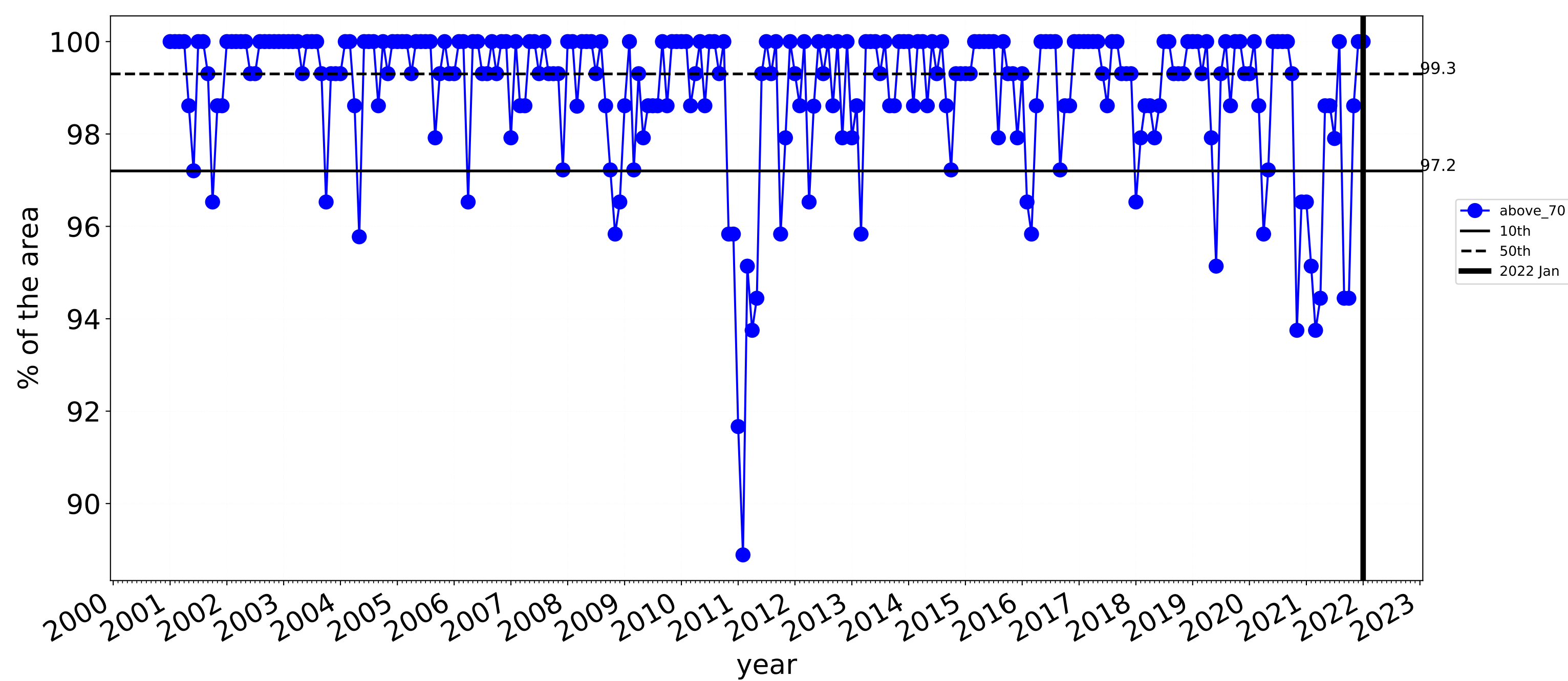# Conservation and natural environments Woodland forest timeseries

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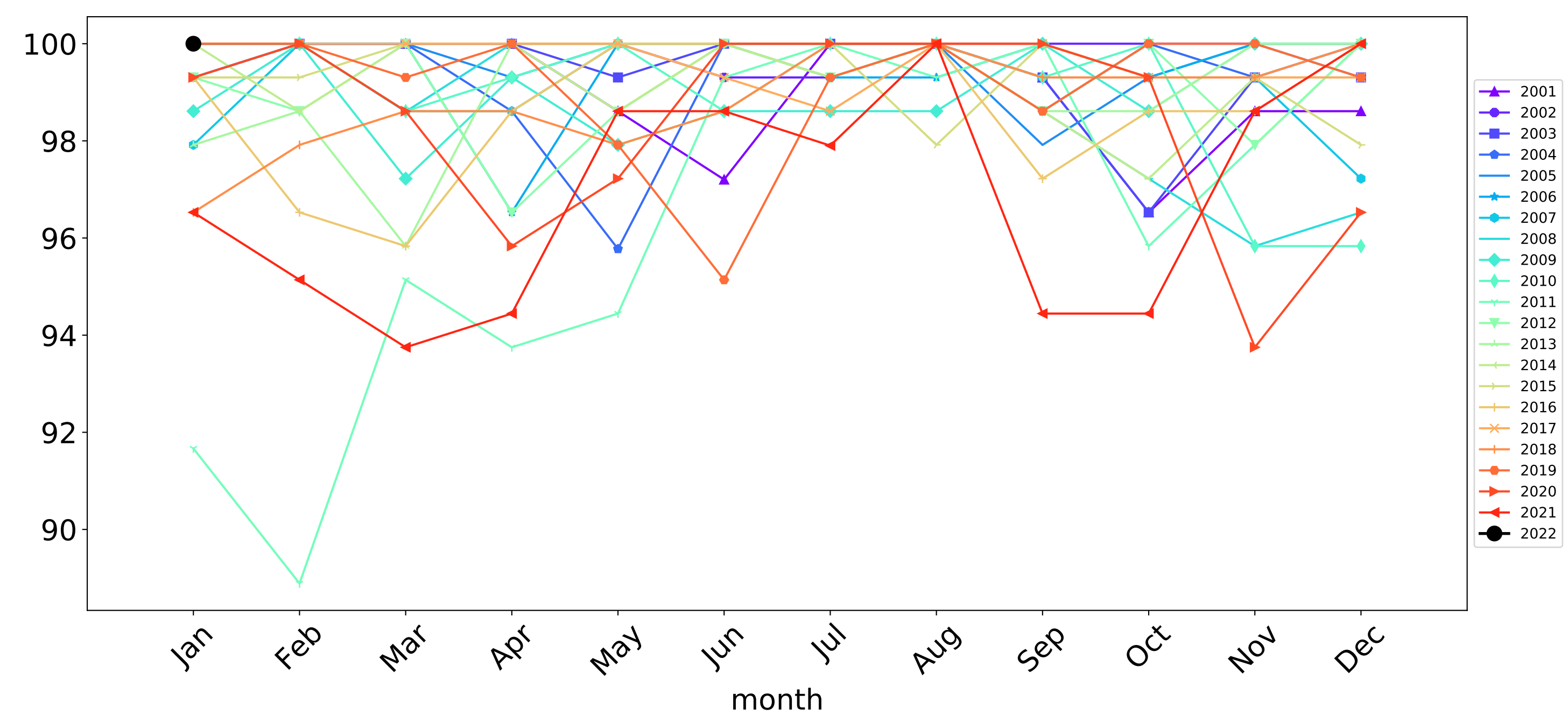


### Wind erosion historical monthly area protected (Total Veg Cov >50%)



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



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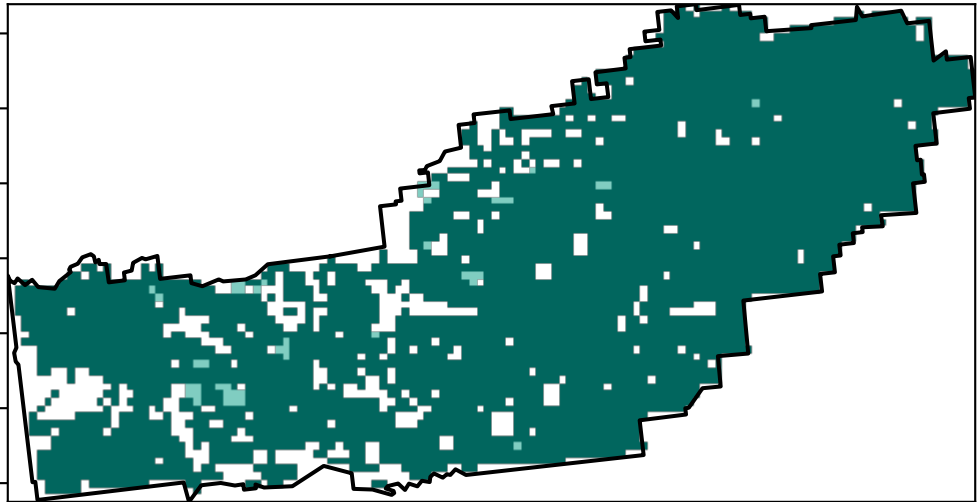
# Agriculture

## Land use and forest cover

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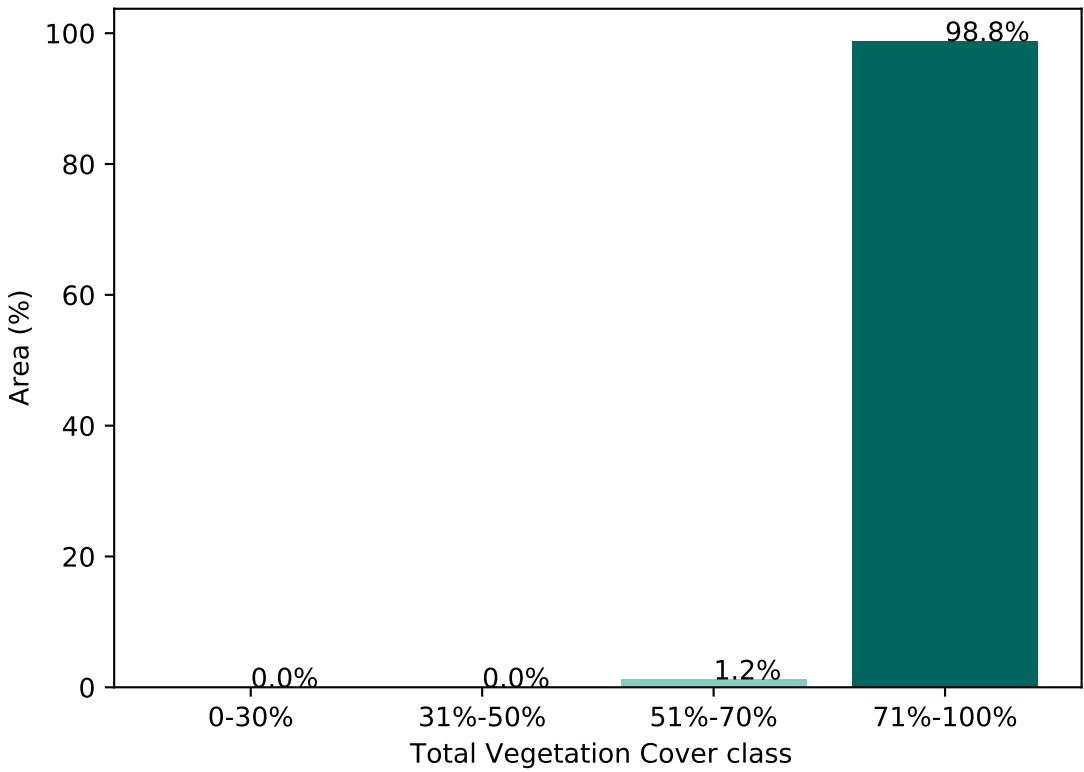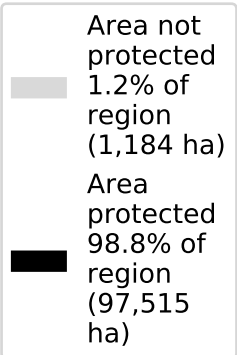
- 1 Agriculture - Grazing - Non forest
- 2 Agriculture - Cropping - Non-irrigated

## Proportion of each land class in area

4.9%    95.1%

Area (%)

Land use class

## Total Vegetation Cover [%]

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

## Proportion of vegetation cover class in area

0.0%    0.0%    1.2%    98.8%

Area (%)

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

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

Area not protected
1.2% of region
(1,184 ha)

Area protected
98.8% of region
(97,515 ha)
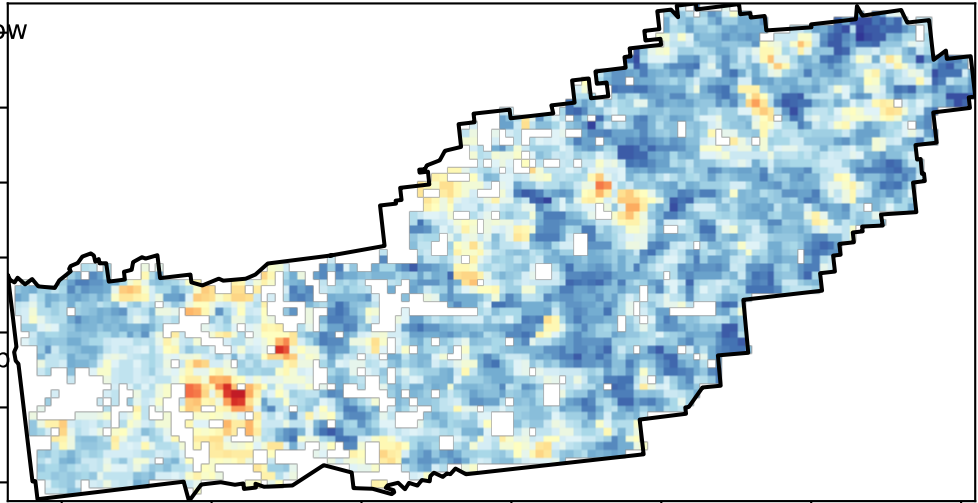
## % Area protected from wind erosion (>50%)
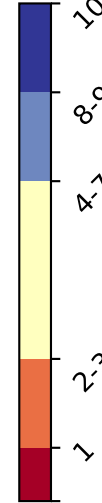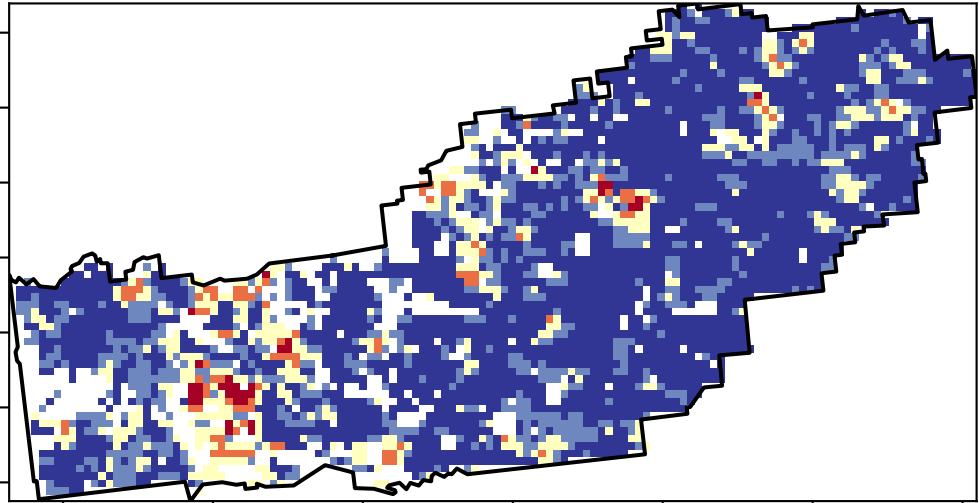
Area protected
100.0% of region
(98,700 ha)

## 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

10
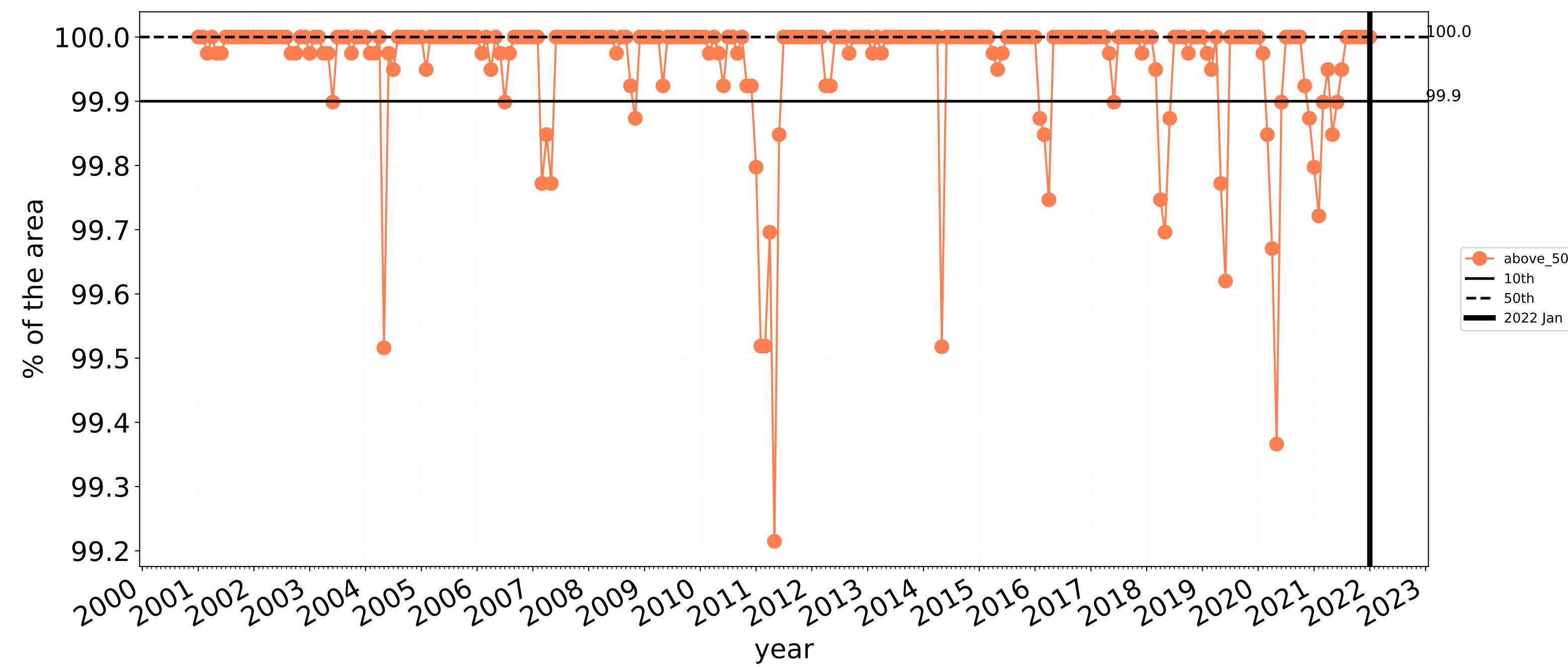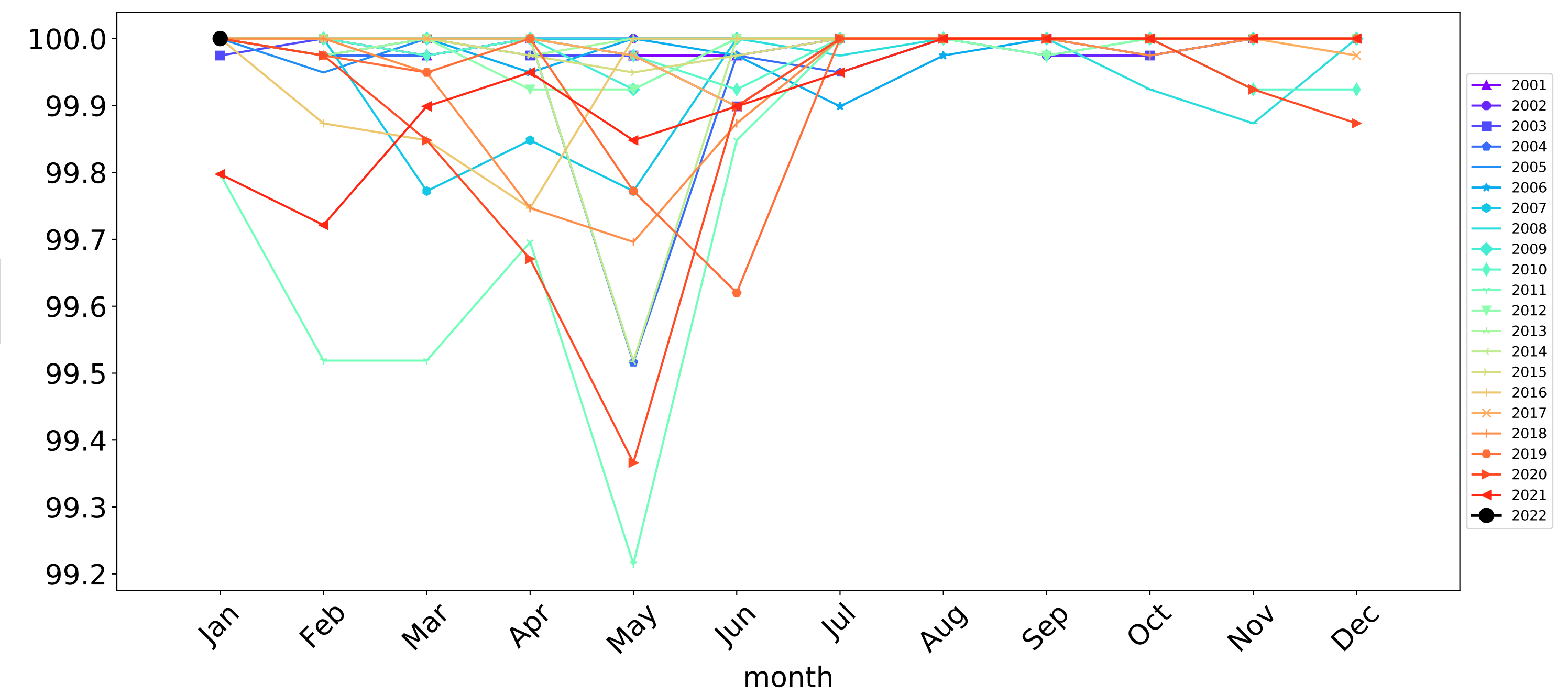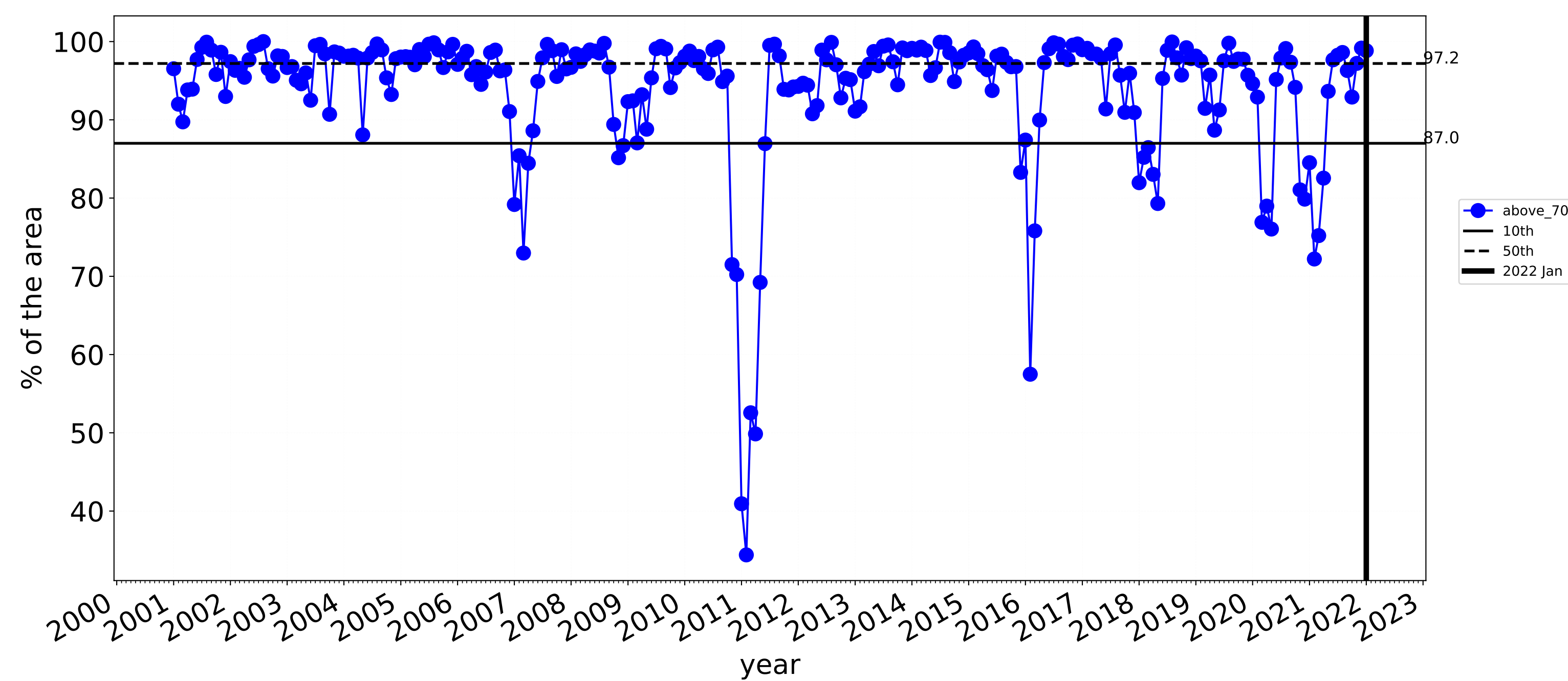
# Agriculture timeseries

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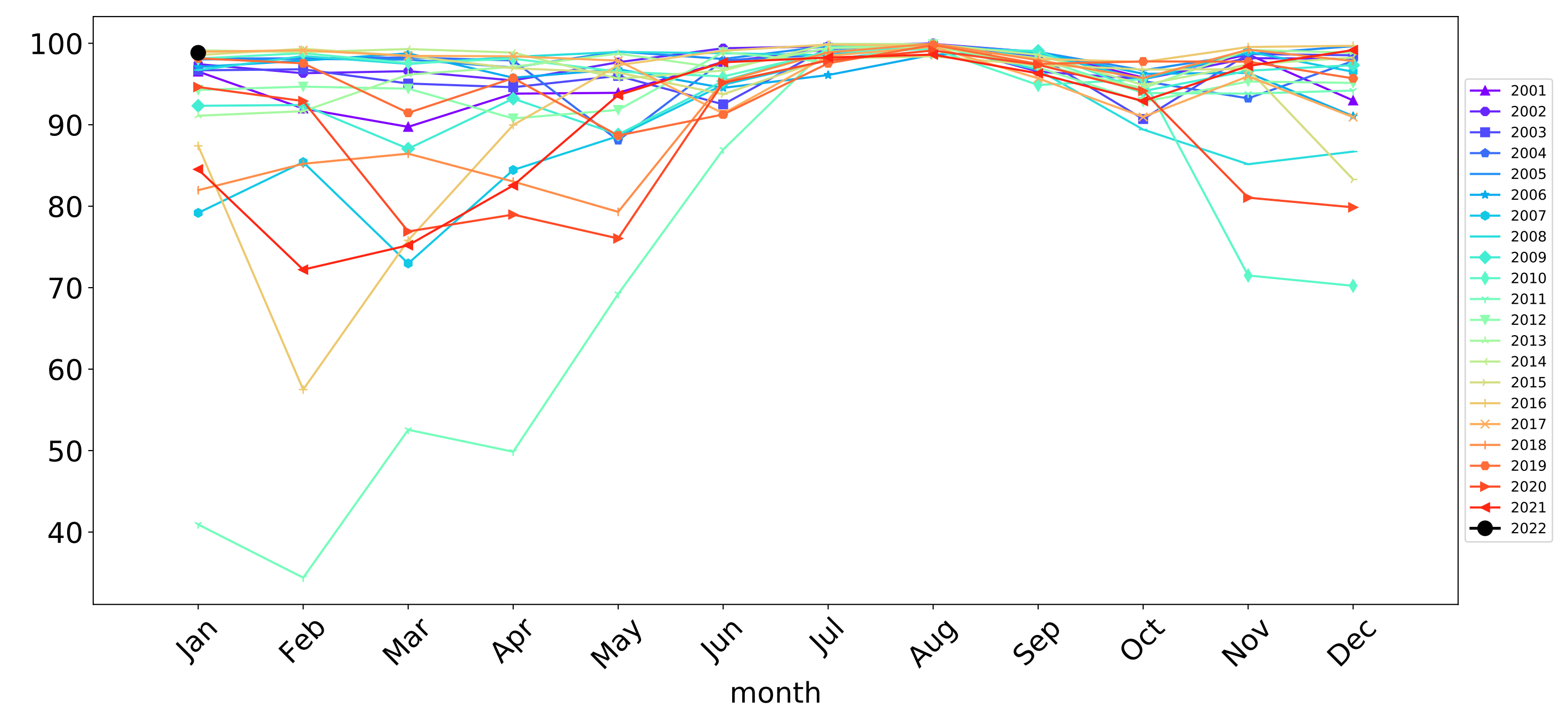


### Wind erosion historical monthly area protected (Total Veg Cov >50%)



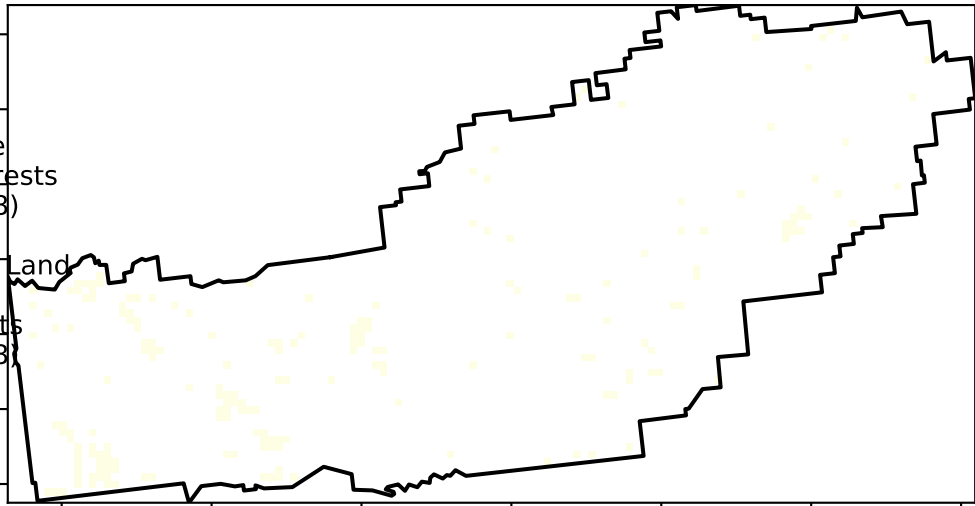### Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



### 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
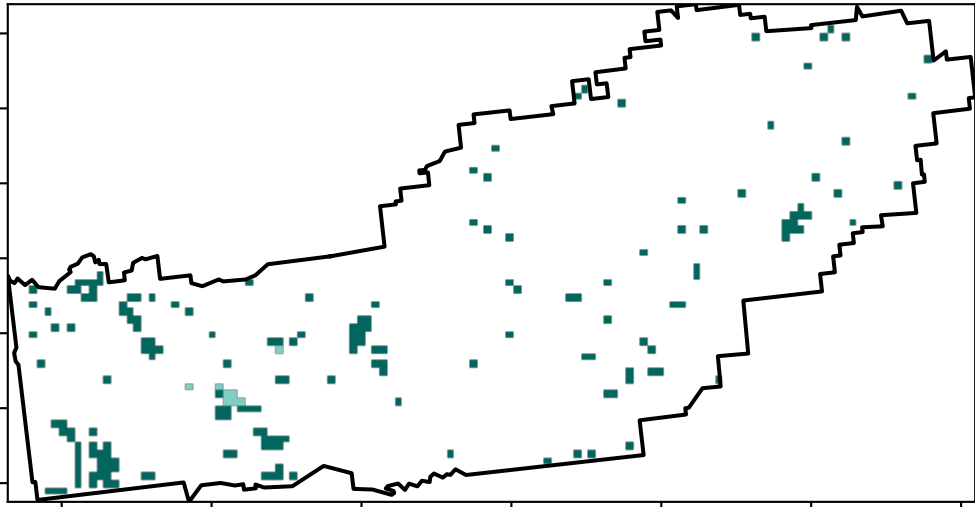(2018) and Forests
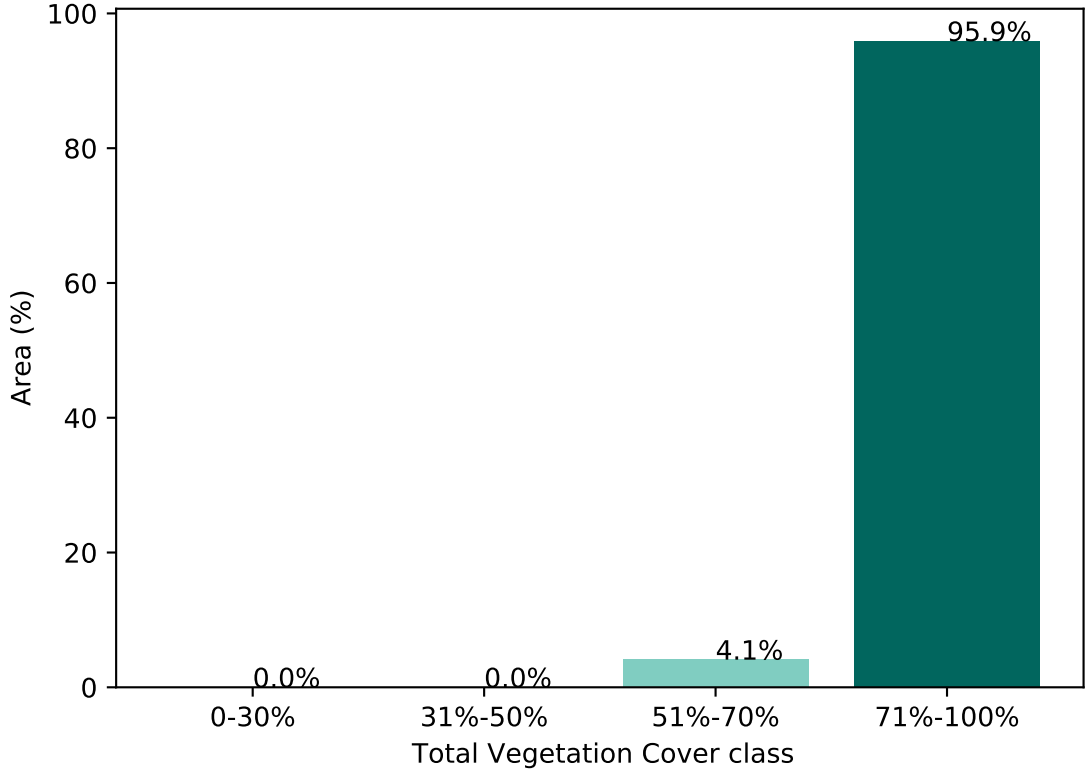of Australia (2018)

1 Agriculture - Grazing - Non forest

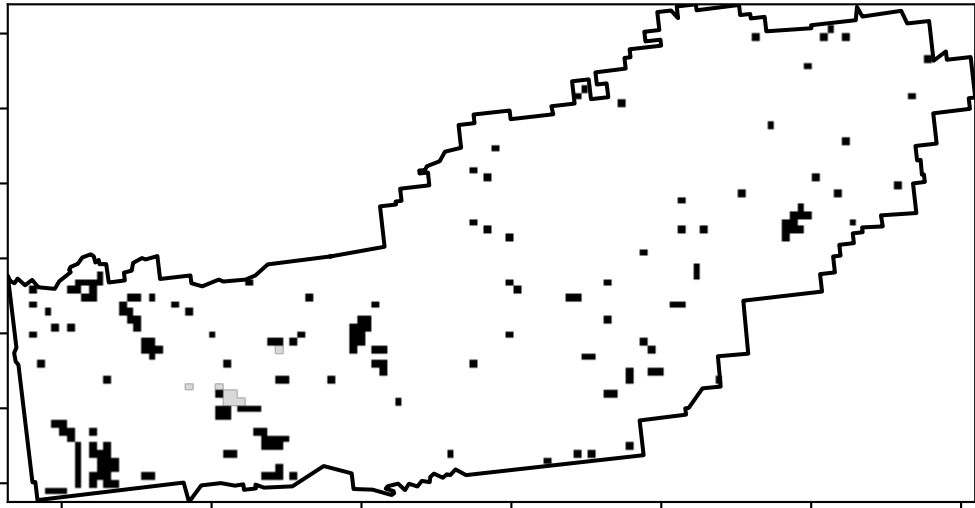## Proportion of each land class in area

100.0%

Area (%)

Land use class

## Total Vegetation Cover [%]

71%-100%

51%-70%

31%-50%

0-30%

## Proportion of vegetation cover class in area

95.9%

Area (%)

0.0%  0.0%  4.1%

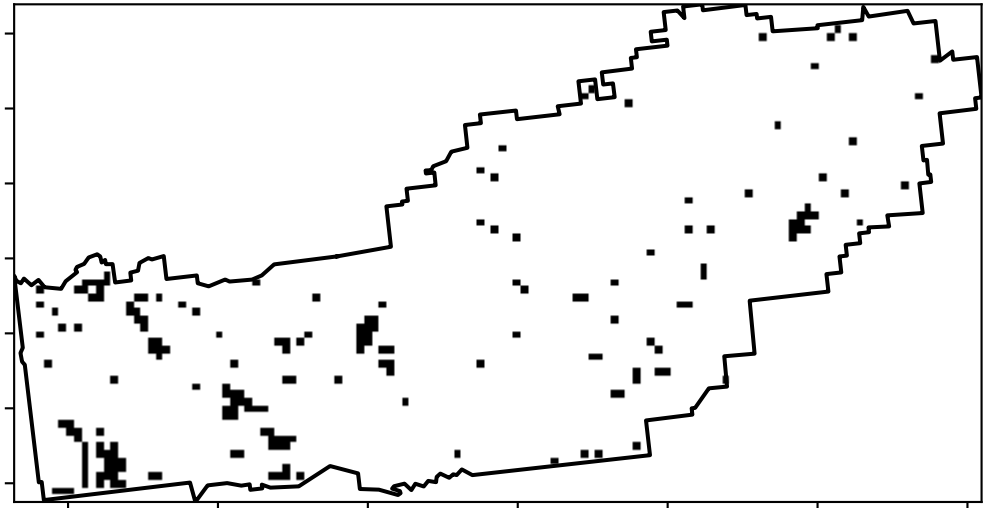0-30%   31%-50%   51%-70%   71%-100%

Total Vegetation Cover class

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

Area not
protected
4.1% of
region
(198 ha)

Area
protected
95.9% of
region
(4,651 ha)

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

Area
protected
100.0% of
region
(4,850 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)

1 Agriculture - Grazing - Non forest

## 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
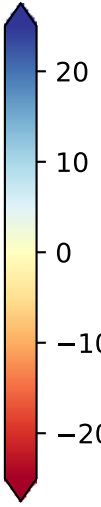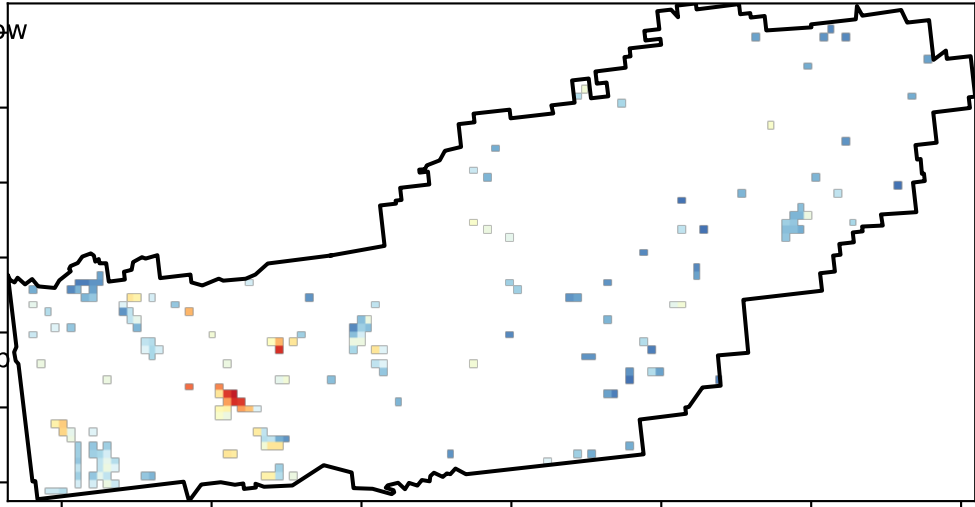4.1% of
region
(198 ha)

Area
protected
95.9% of
region
(4,651 ha)

## % Area protected from wind erosion (>50%)
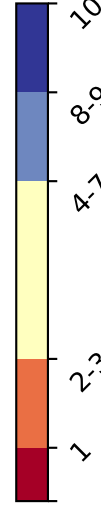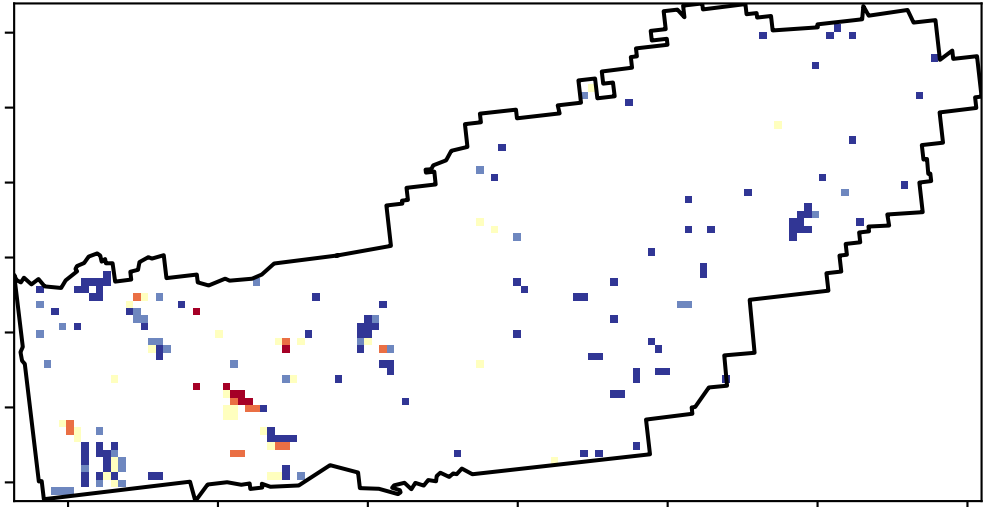
Area
protected
100.0% of
region
(4,850 ha)

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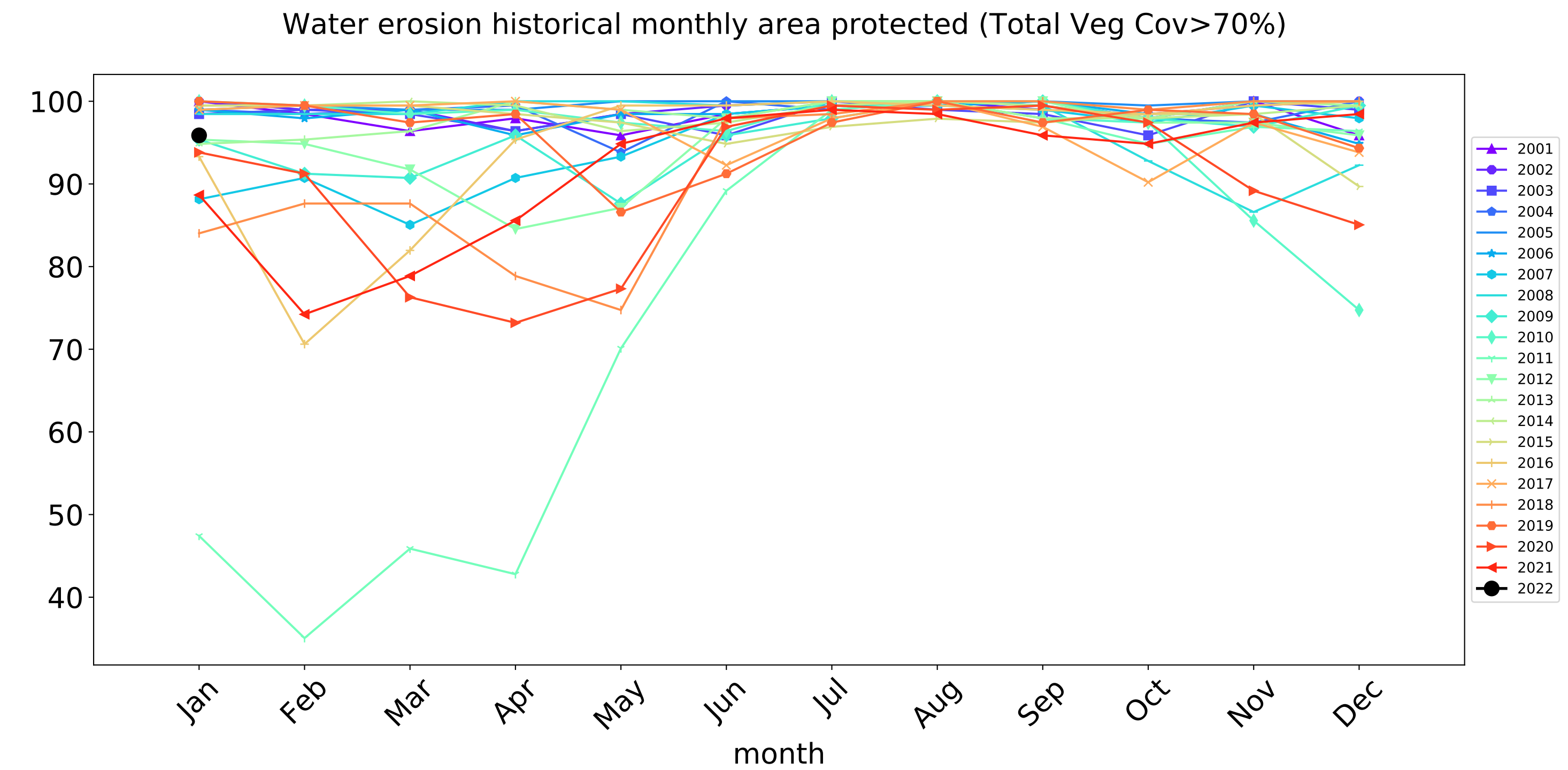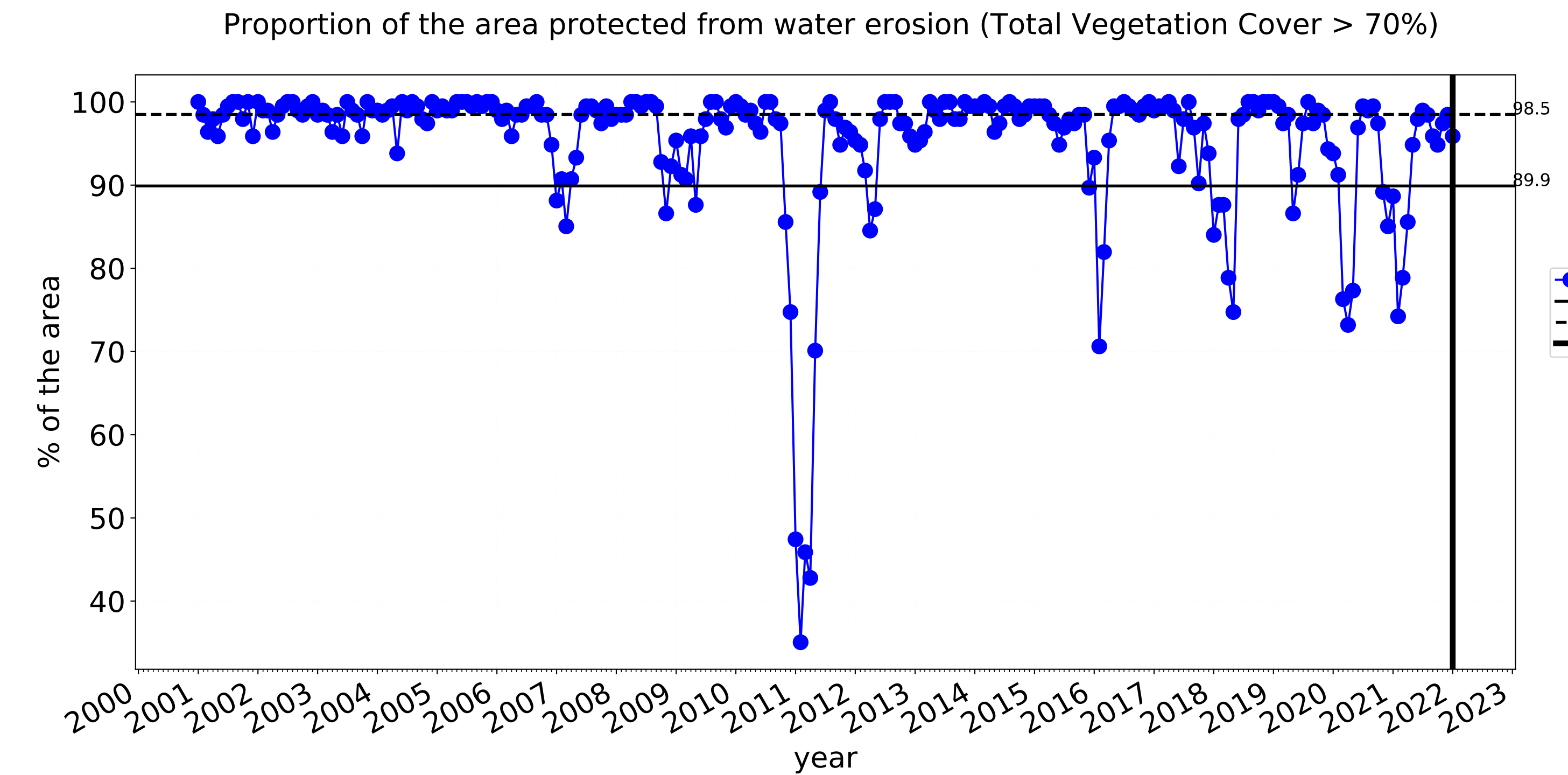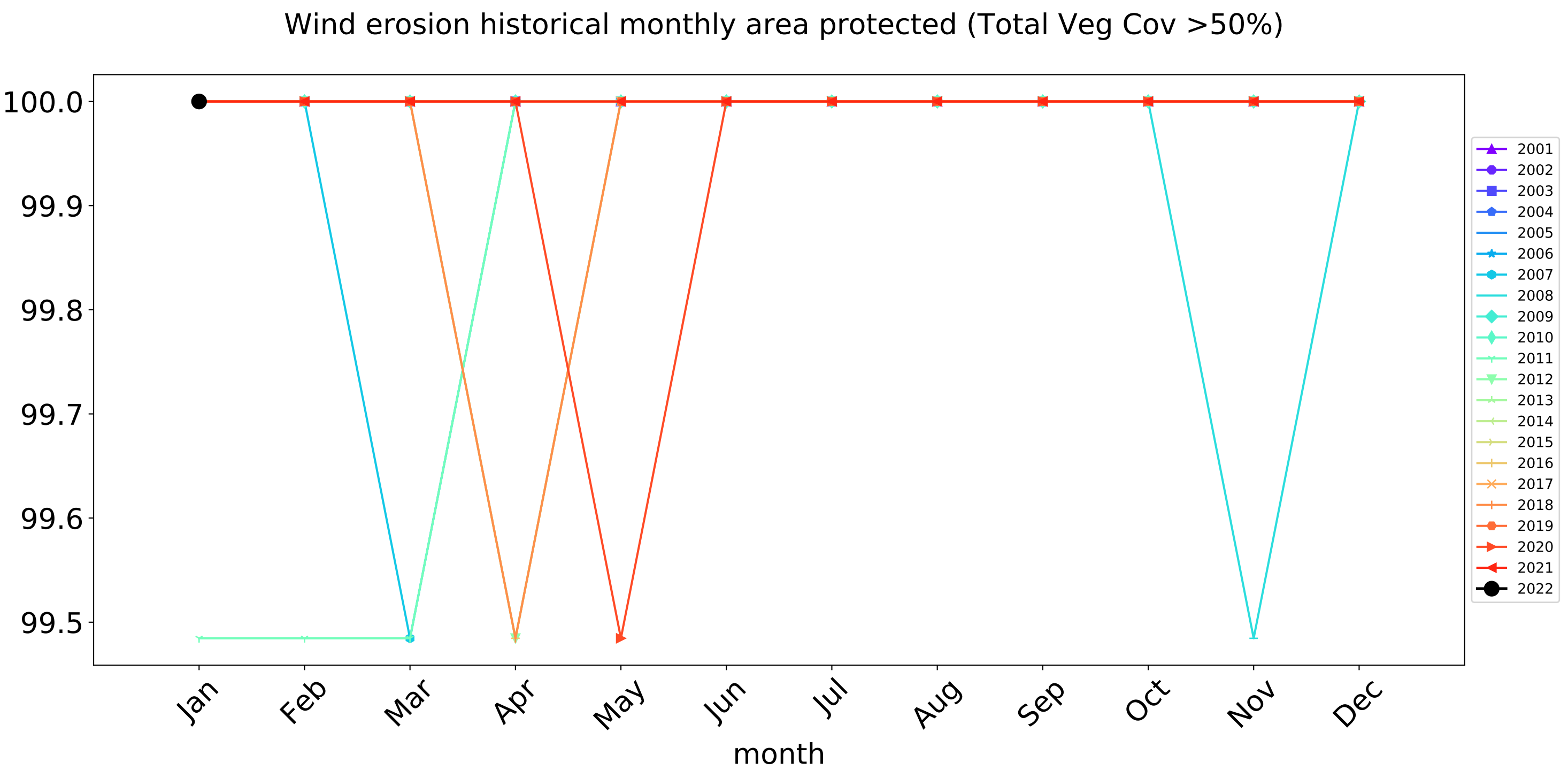records for that month of
the map using baseline
from 2001 to 2019.

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)

1 Agriculture - Cropping - Non-irrigated

## Total Vegetation Cover [%]

71%-100%

51%-70%

31%-50%

0-30%

## Proportion of vegetation cover class in area

0.0%    0.0%    1.0%    99.0%

Area (%)

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

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

Area not
protected
1.0% of
region
(938 ha)
Area
protected
99.0% of
region
(92,911
ha)
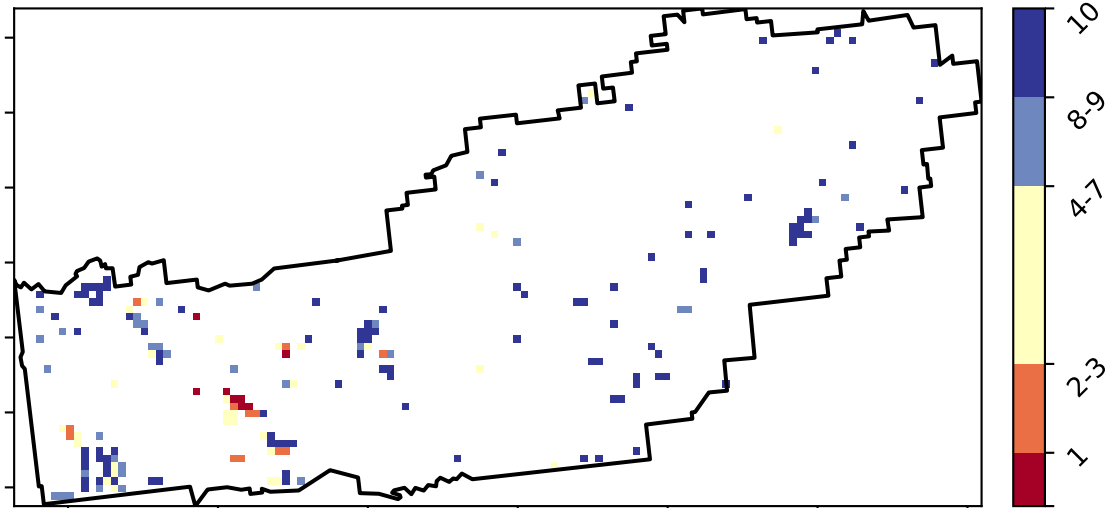
## % Area protected from wind erosion (>50%)

Area
protected
100.0% of
region
(93,850
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
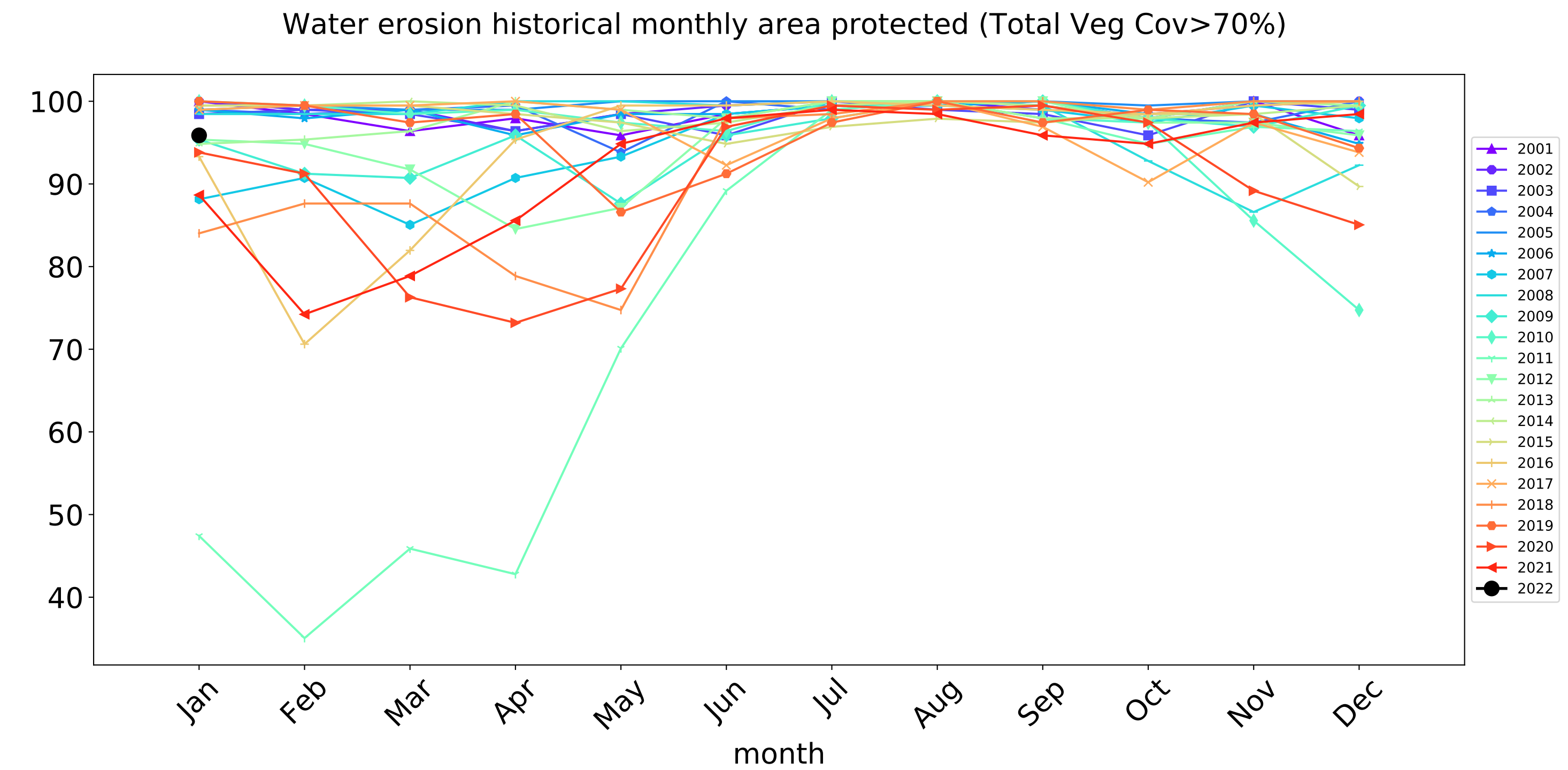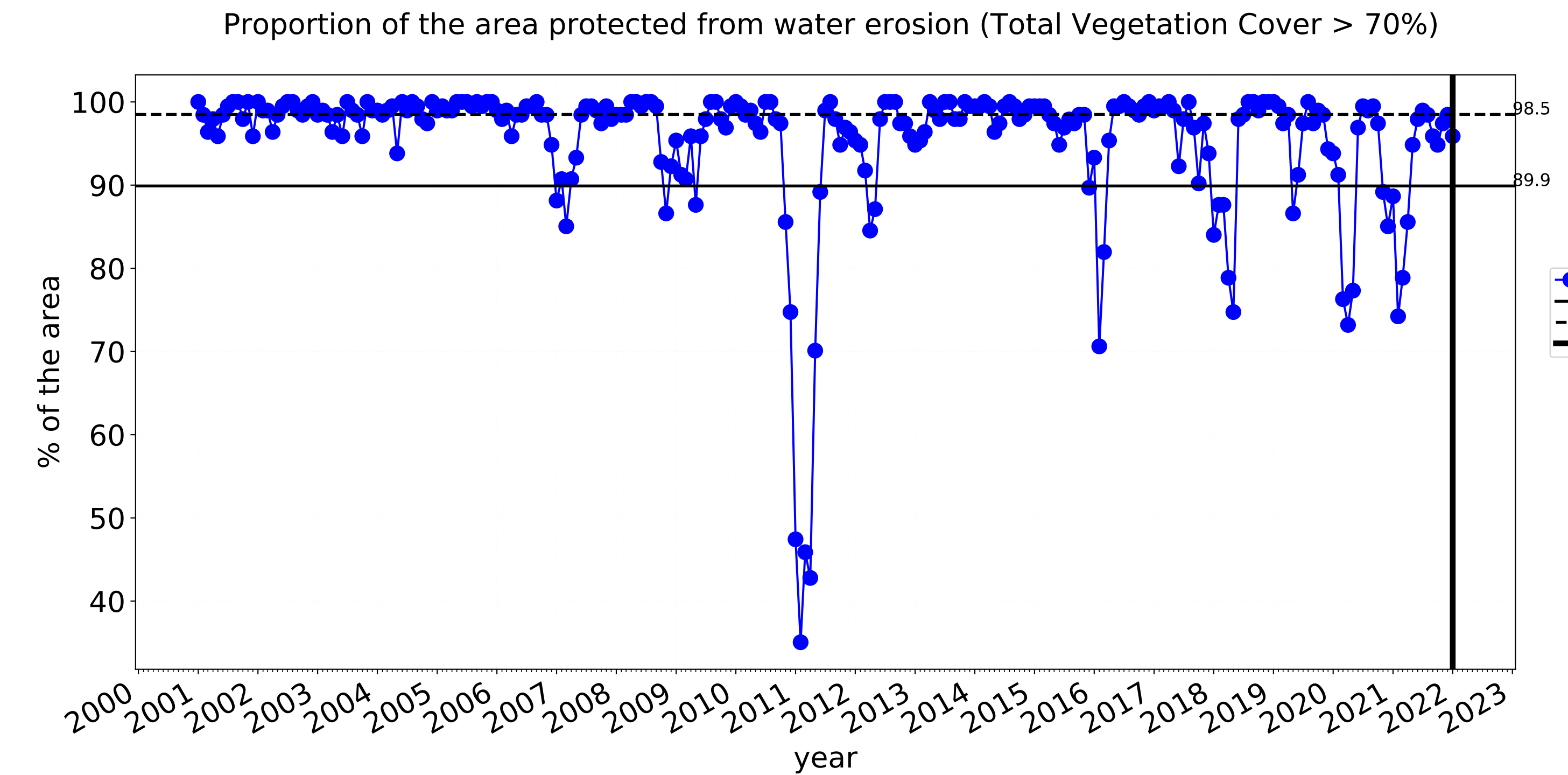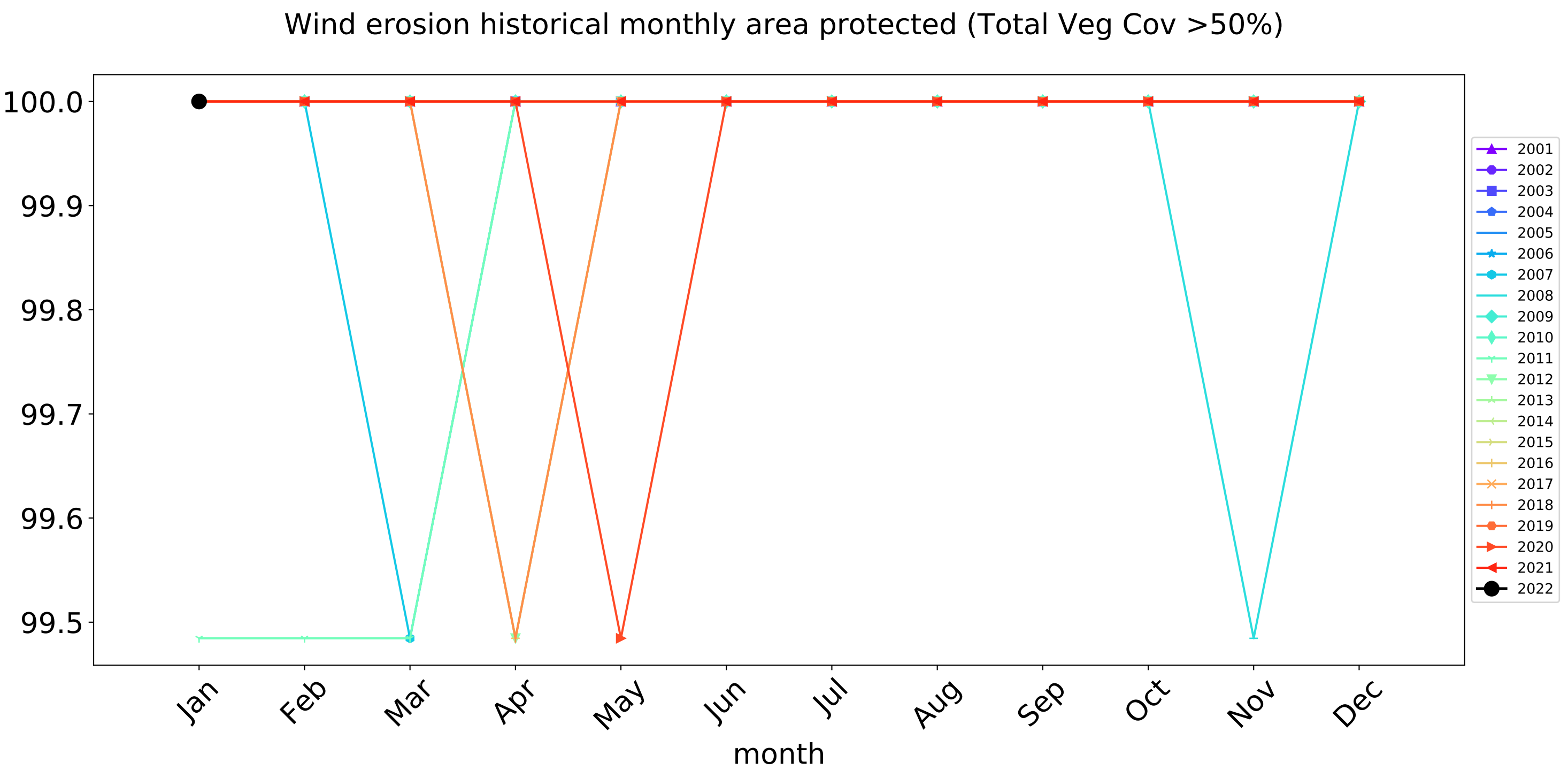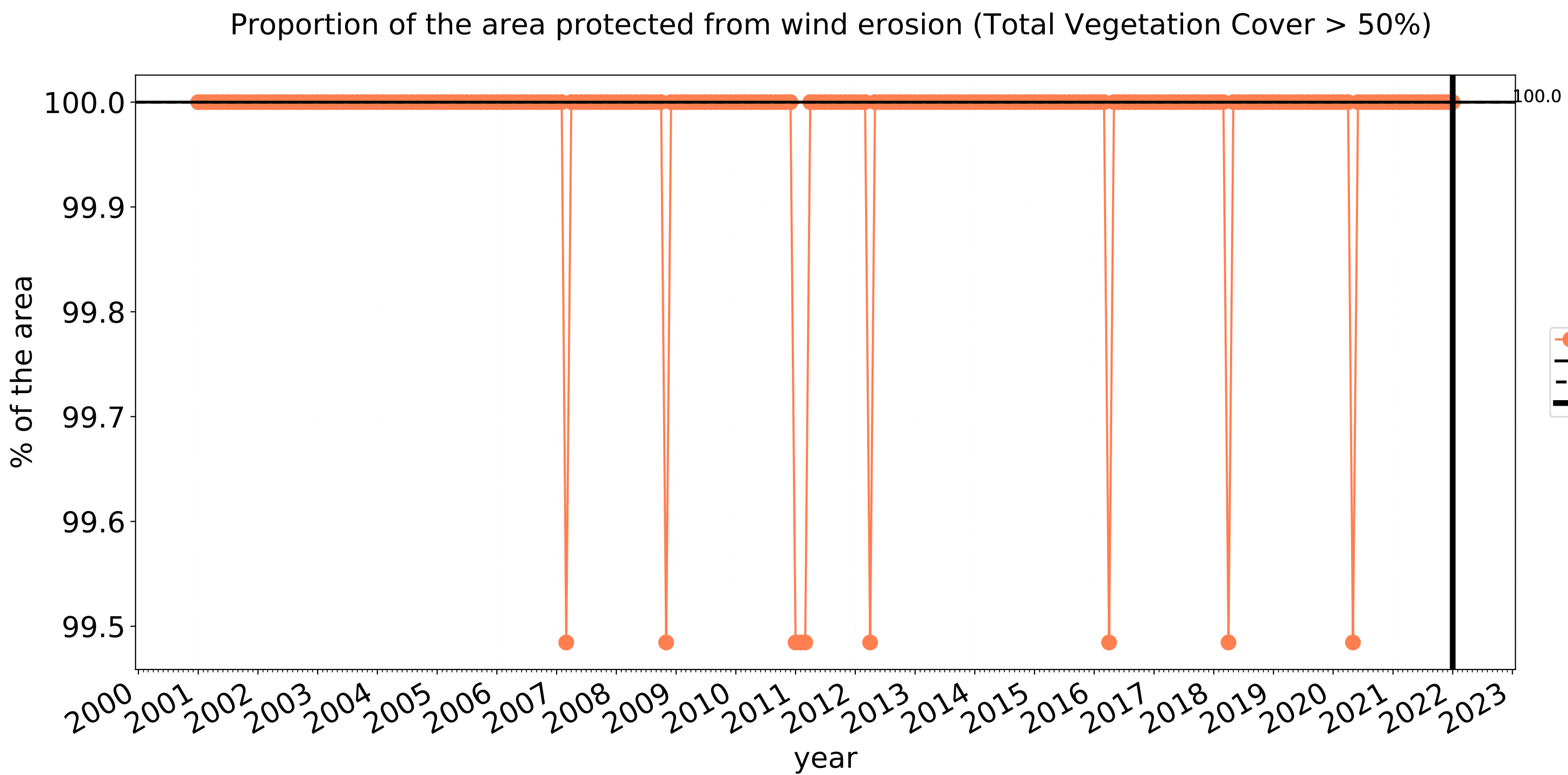from 2001 to
2019.

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.

10

8-9

4-7

2-3

1

CSIRO

tern
Ecosystem Research Infrastructure

Australian Government

National
Landcare
Programme

NSW
GOVERNMENT

# Cropping timeseries

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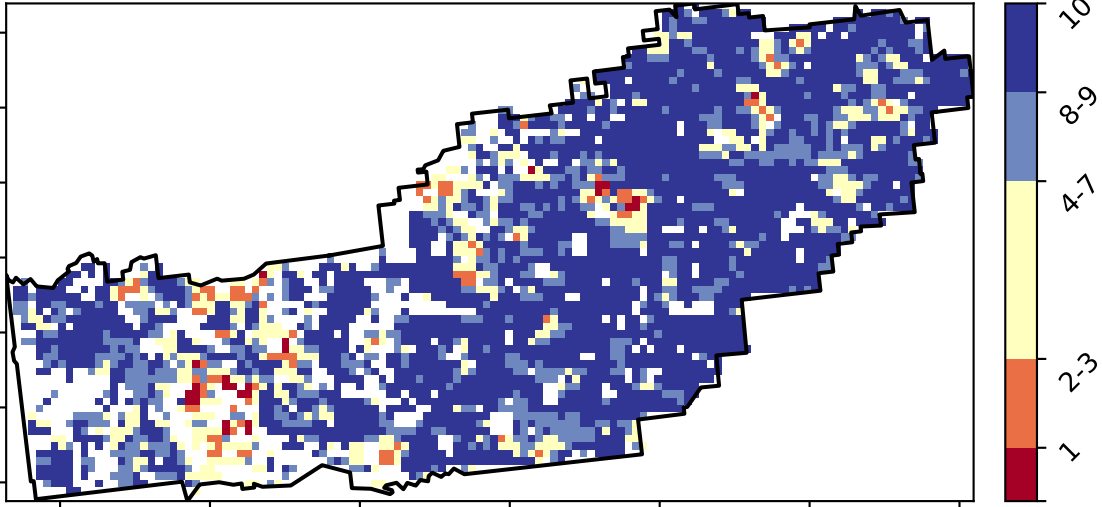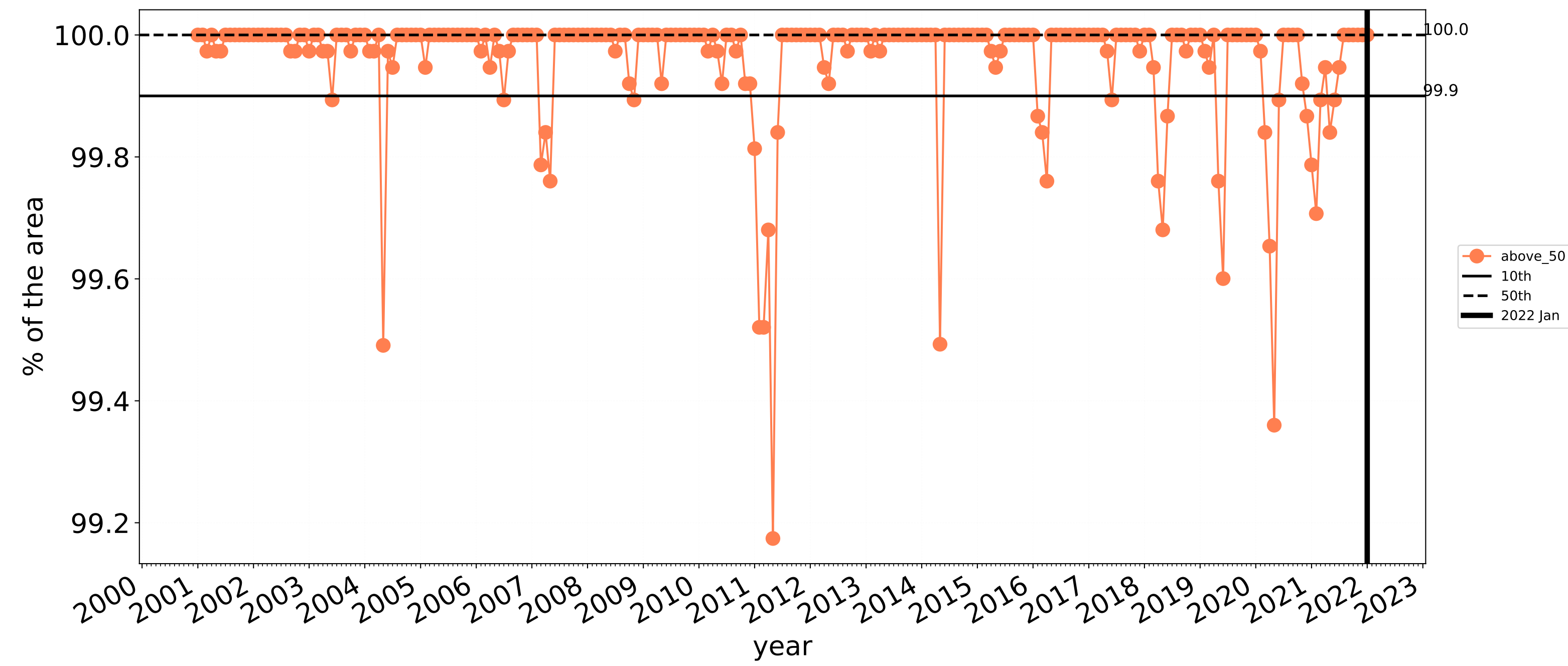


### Wind erosion historical monthly area protected (Total Veg Cov >50%)



### 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)

■ 1 Production native forests and plantation forests

## Total Vegetation Cover [%]

71%-100%

51%-70%

31%-50%

0-30%

## Proportion of vegetation cover class in area

100.0%

0.0%     0.0%     0.0%

Total Vegetation Cover class

Area (%)

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

Area
protected
100.0% of
region
(1,625 ha)

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

Area
protected
100.0% of
region
(1,625 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

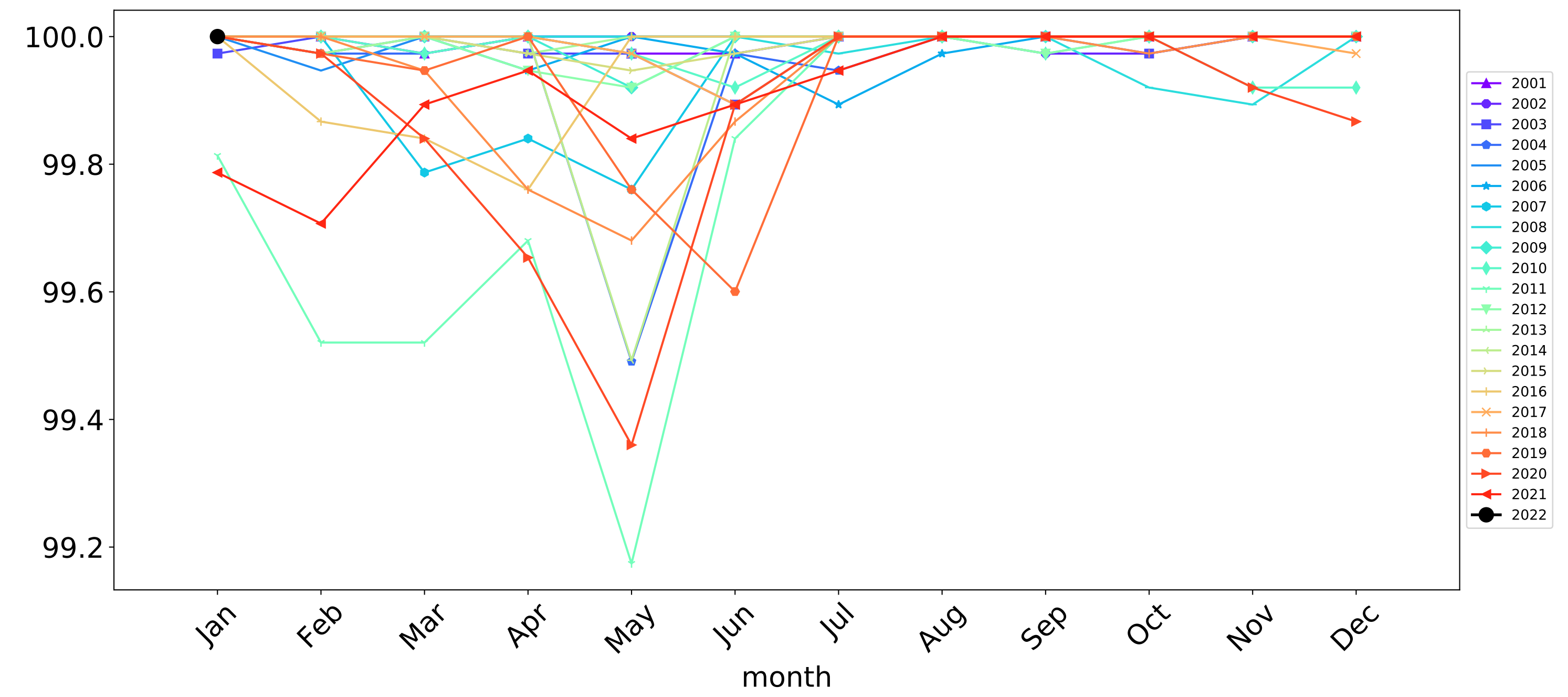4-7

2-3

1
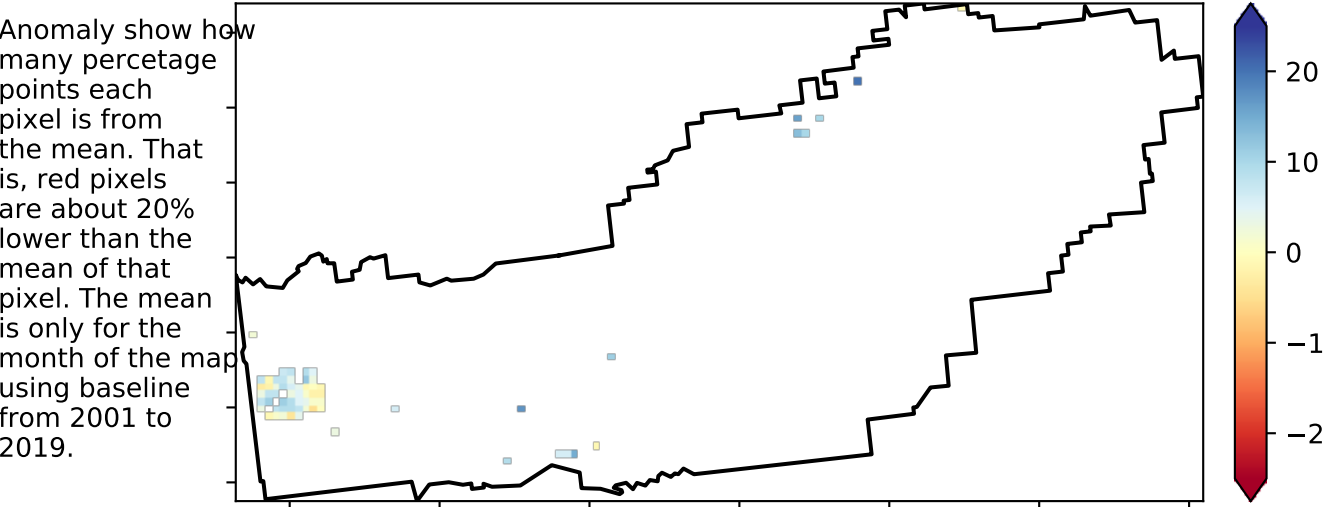
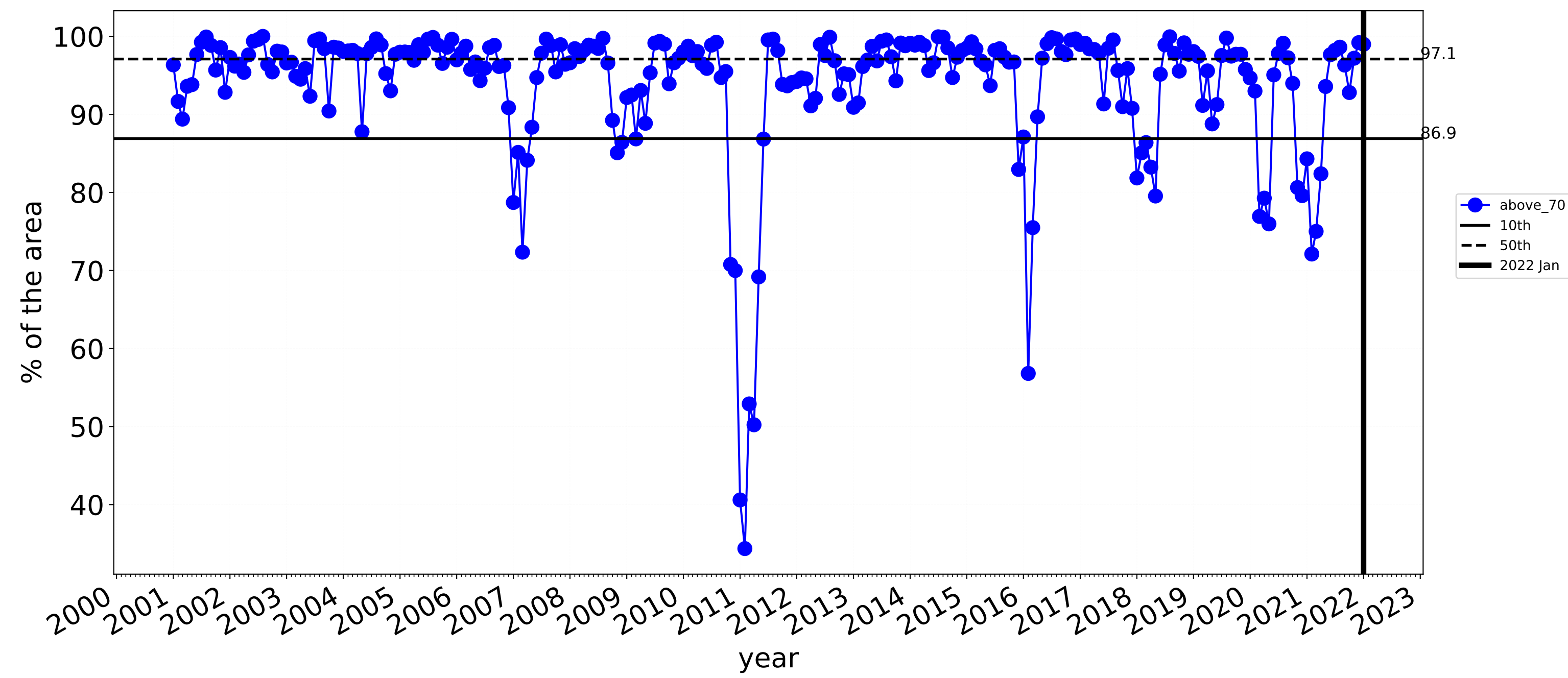# Production native forests and plantation forests timeseries



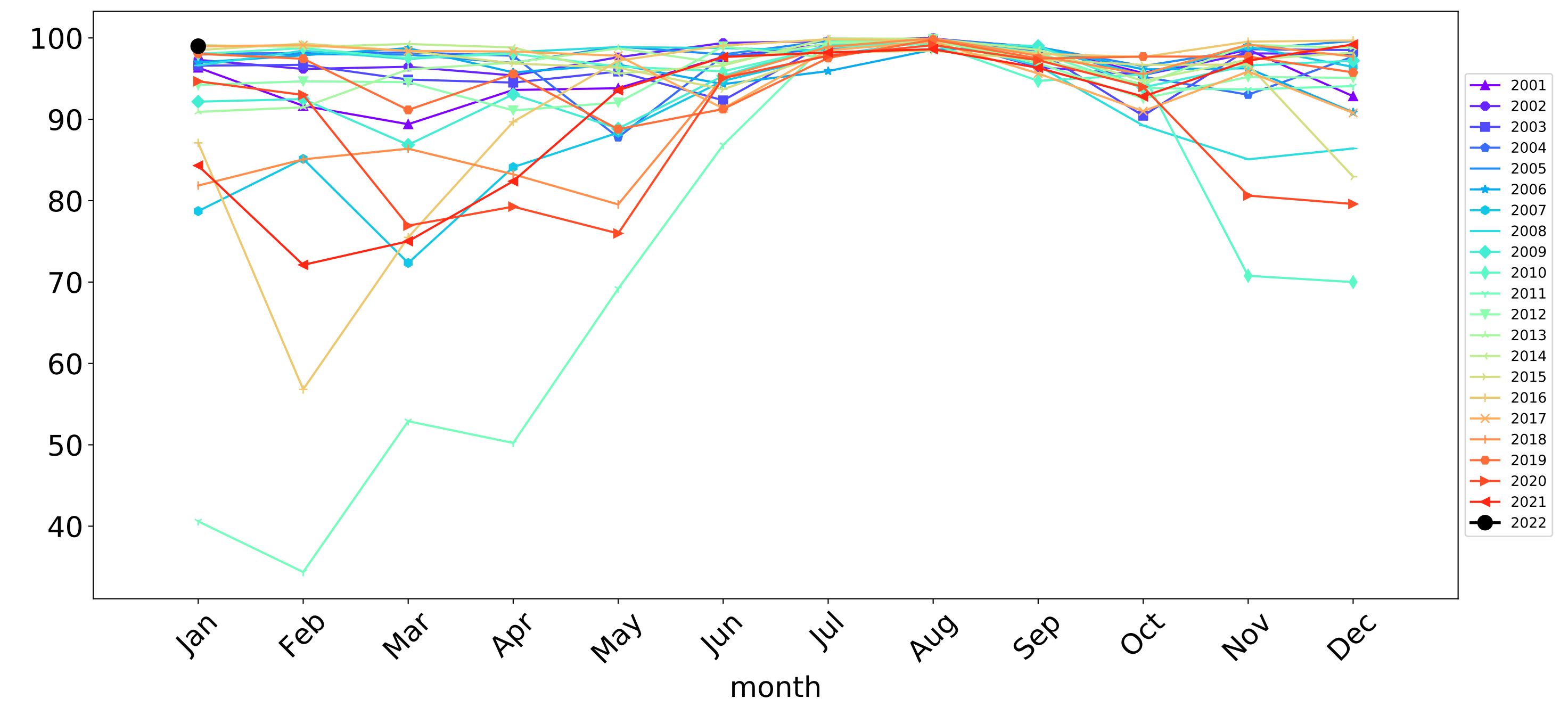Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)

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

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

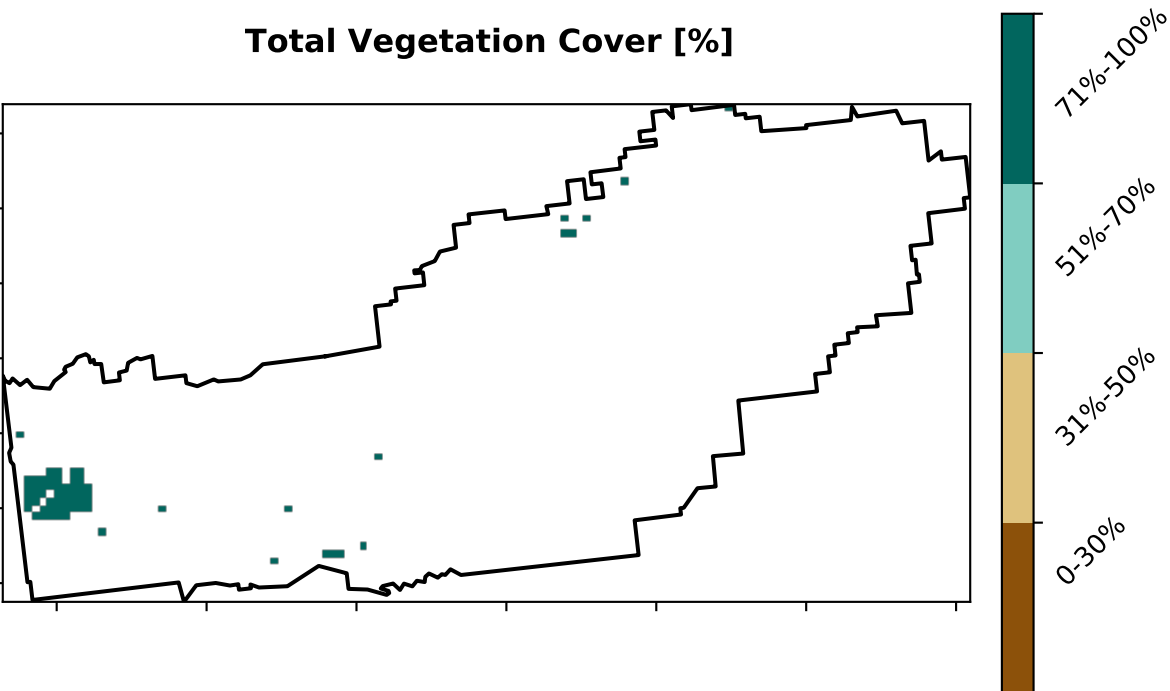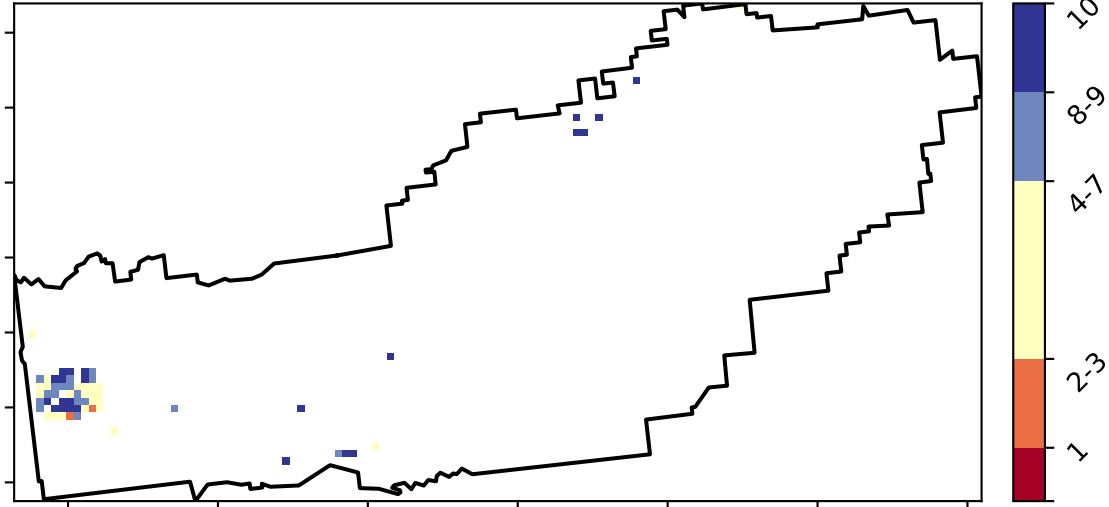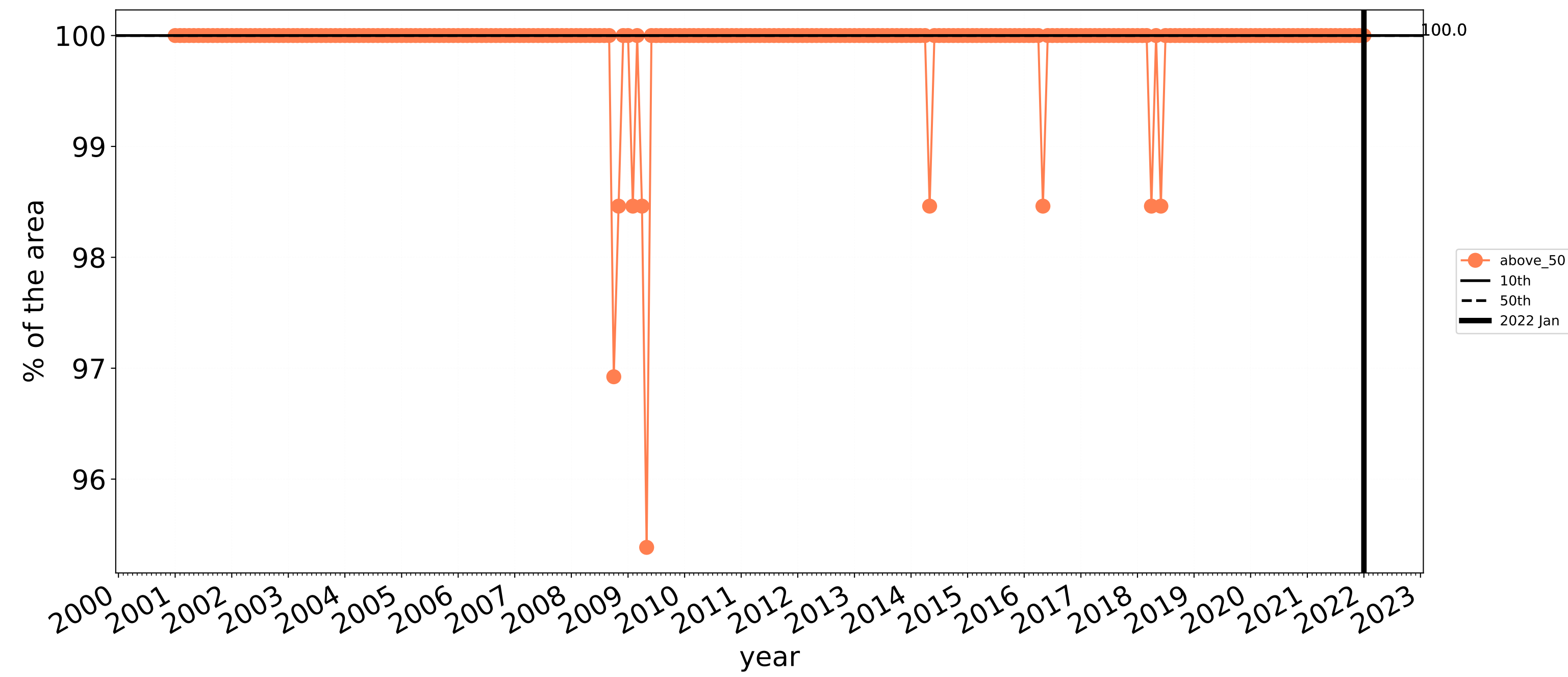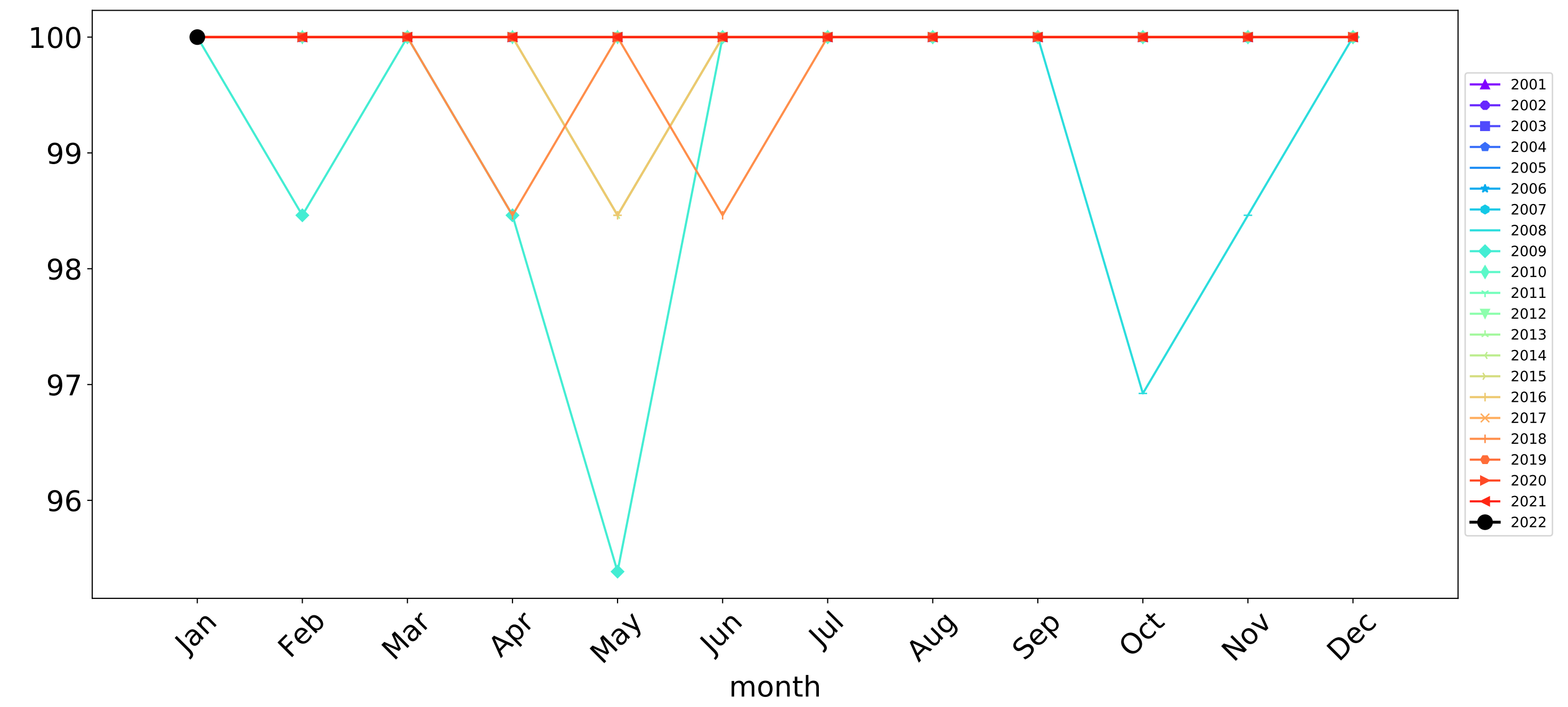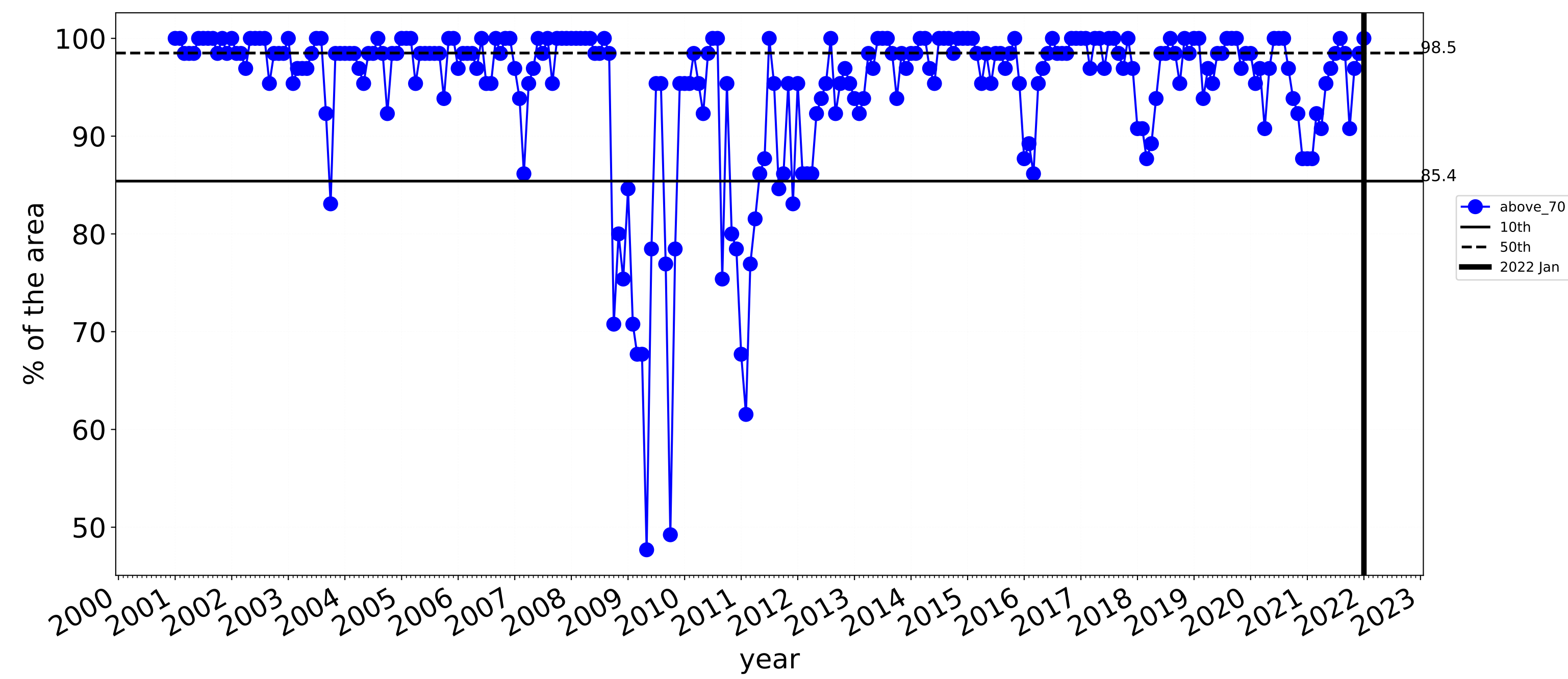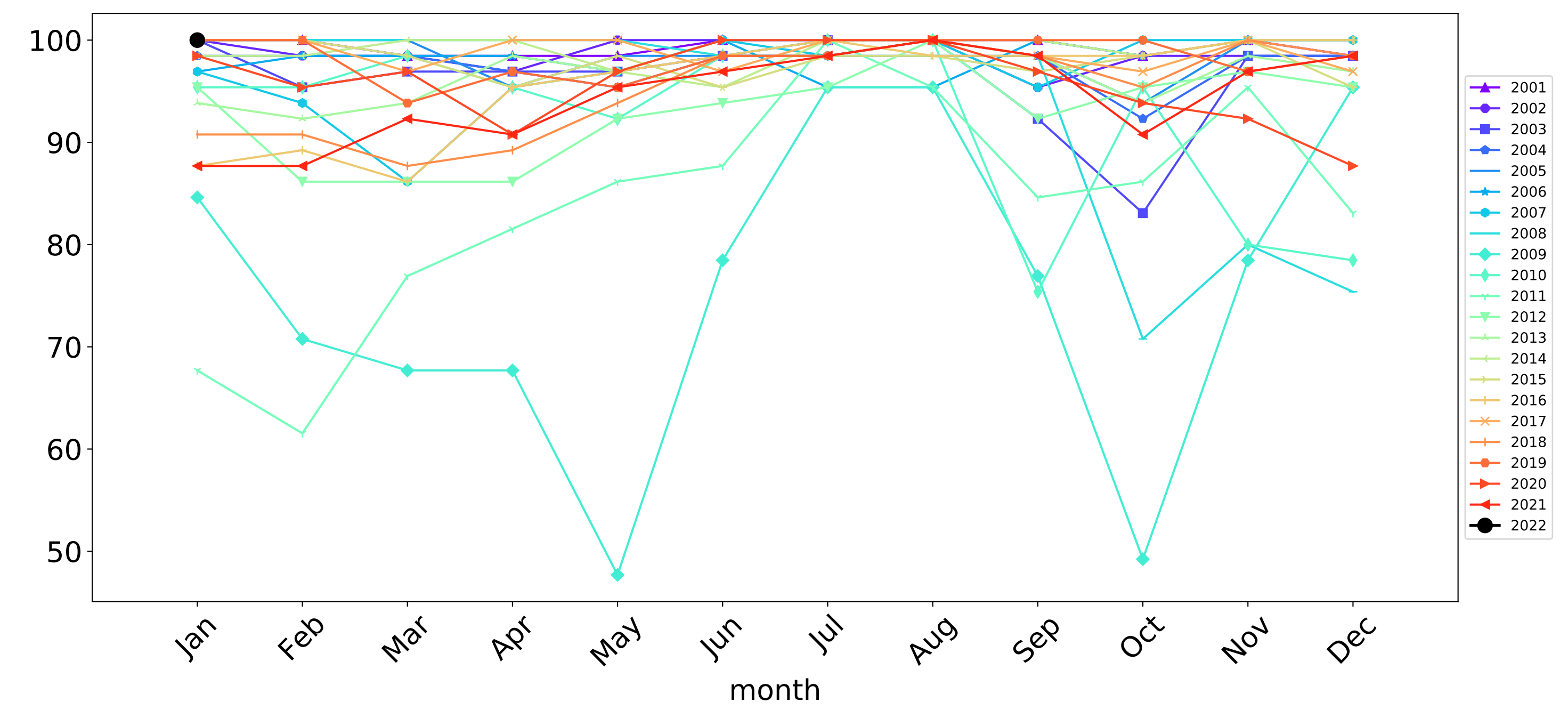Water erosion historical monthly area protected (Total Veg Cov>70%)

# Woodanilling_(S) (112,800 ha and no data 84 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 | 112,800 | 100.0%<br>112,800 | 100.0%<br>112,775 | 98.7%<br>111,375 | 91.0%<br>102,600 | 58.1%<br>65,550 | 33.4%<br>37,675 |
| Conservation and natural environments | 11,125 | 100.0%<br>11,125 | 100.0%<br>11,125 | 97.8%<br>10,875 | 78.2%<br>8,700 | 31.2%<br>3,475 | 9.4%<br>1,050 |
| Conservation and natural environments non forest | 7,525 | 100.0%<br>7,525 | 100.0%<br>7,525 | 96.7%<br>7,275 | 69.4%<br>5,225 | 19.3%<br>1,450 | 5.6%<br>425 |
| Conservation and natural environments Woodland forest | 3,600 | 100.0%<br>3,600 | 100.0%<br>3,600 | 100.0%<br>3,600 | 96.5%<br>3,475 | 56.2%<br>2,025 | 17.4%<br>625 |
| Agriculture | 98,700 | 100.0%<br>98,700 | 100.0%<br>98,700 | 98.8%<br>97,550 | 92.6%<br>91,400 | 61.4%<br>60,600 | 36.1%<br>35,675 |
| Grazing | 4,850 | 100.0%<br>4,850 | 100.0%<br>4,850 | 95.9%<br>4,650 | 90.2%<br>4,375 | 62.4%<br>3,025 | 42.3%<br>2,050 |
| Grazing non forest | 4,850 | 100.0%<br>4,850 | 100.0%<br>4,850 | 95.9%<br>4,650 | 90.2%<br>4,375 | 62.4%<br>3,025 | 42.3%<br>2,050 |
| Cropping | 93,850 | 100.0%<br>93,850 | 100.0%<br>93,850 | 99.0%<br>92,900 | 92.7%<br>87,025 | 61.3%<br>57,575 | 35.8%<br>33,625 |
| Production native forests and plantation forests | 1,625 | 100.0%<br>1,625 | 100.0%<br>1,625 | 100.0%<br>1,625 | 84.6%<br>1,375 | 41.5%<br>675 | 21.5%<br>350 |