

Total vegetation cover soil protection

Region:LGA Ballina_(A) NSW

Date: February 2023

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>



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Ecosystem Research Infrastructure

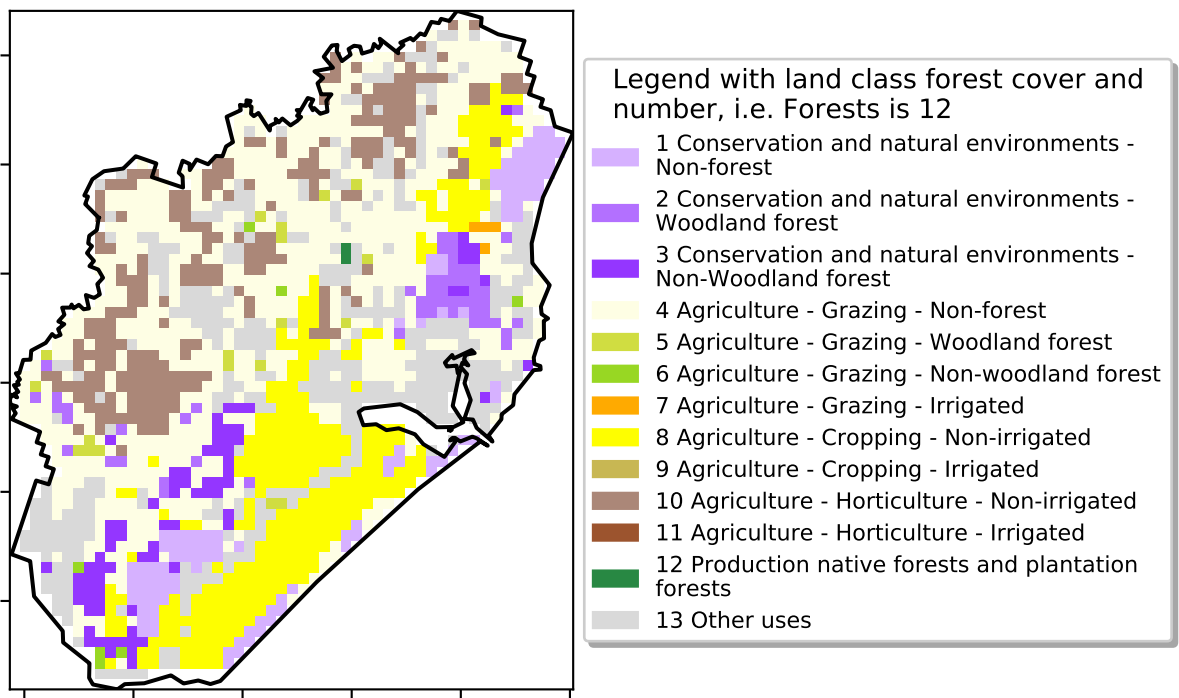


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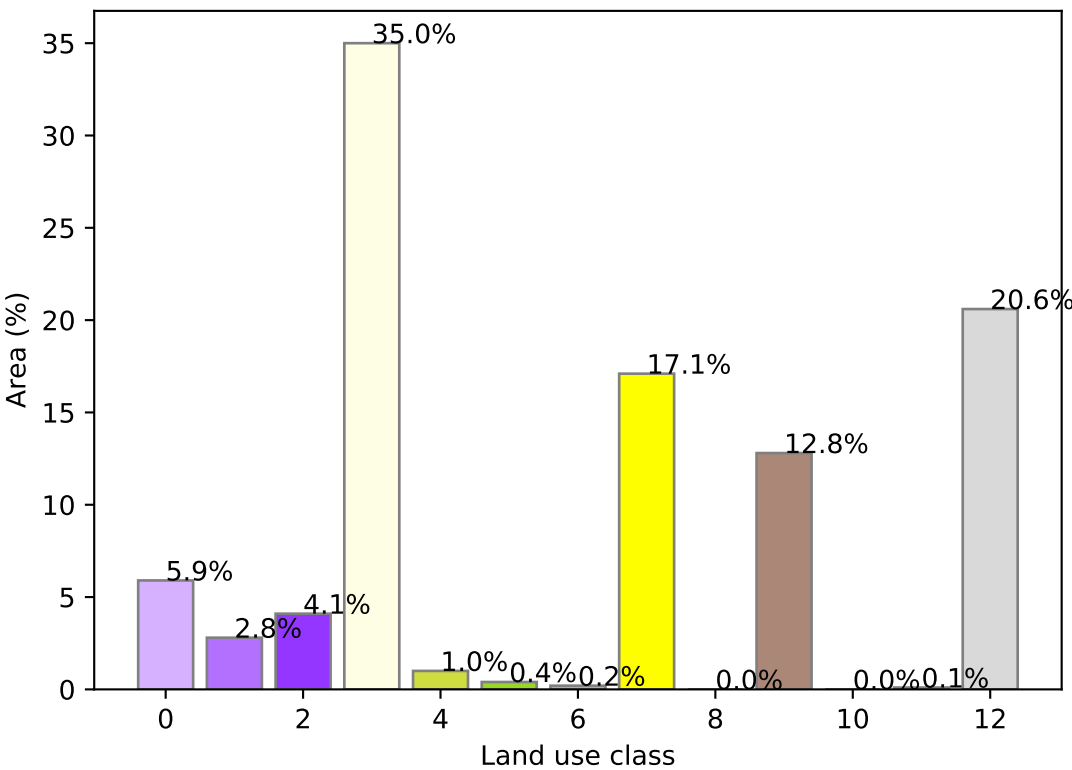


Vegetation Cover Feb 2023

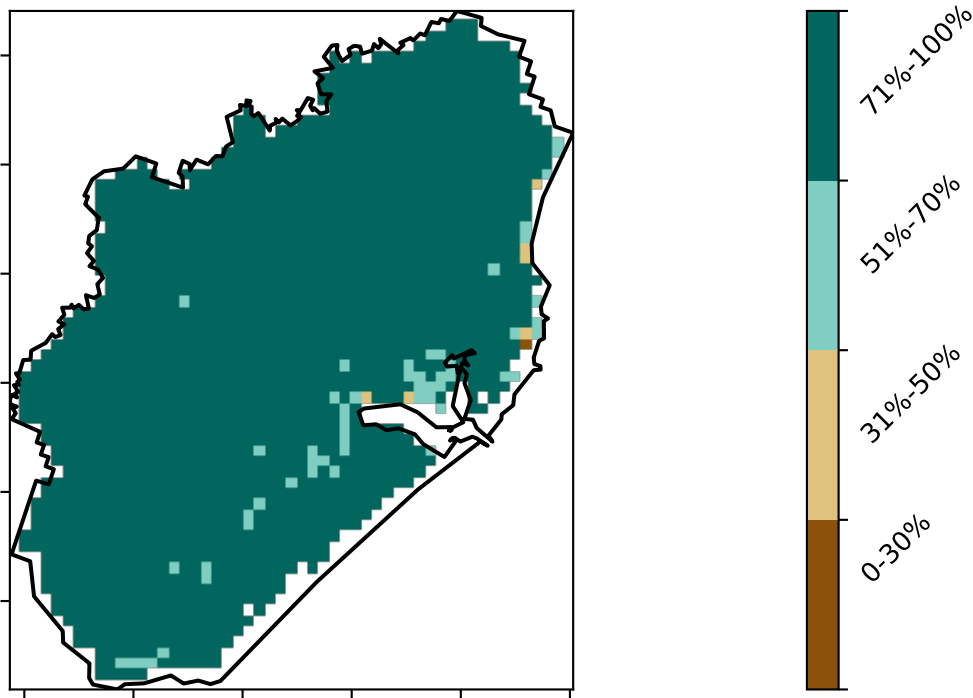
Land use and forest cover



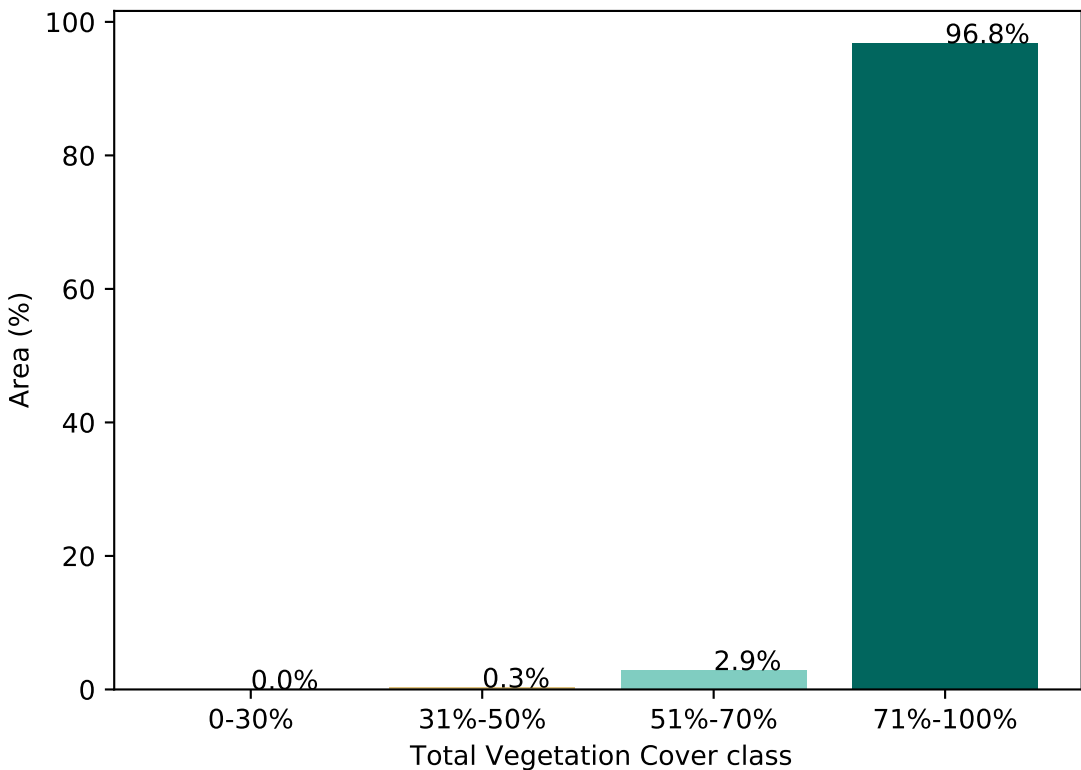
Proportion of each land class in area



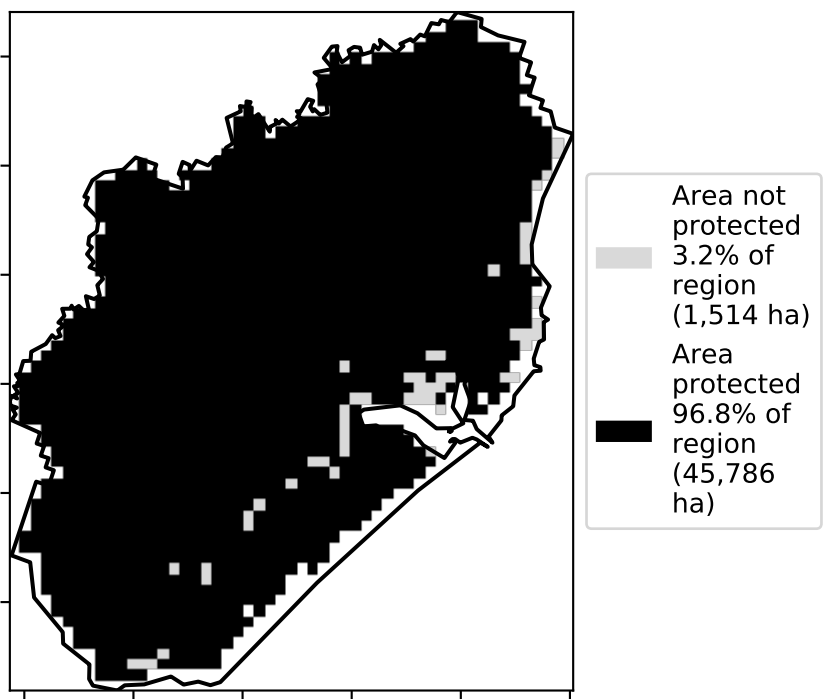
Total Vegetation Cover [%]



Proportion of vegetation cover class in area



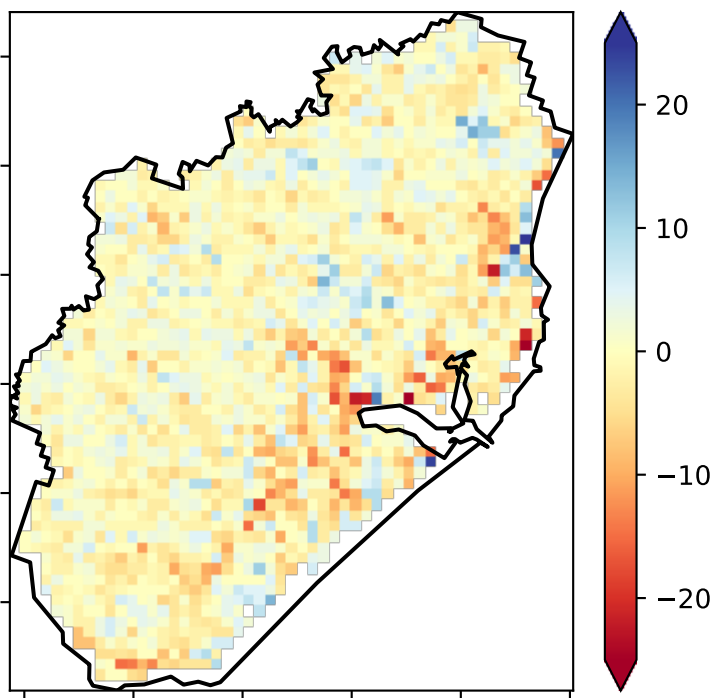
% Area protected from water erosion (>70%)



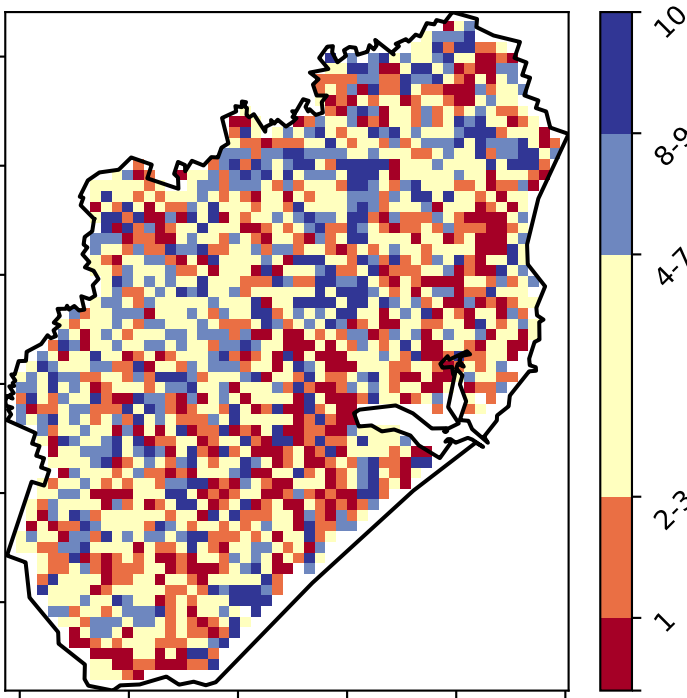
% Area protected from wind erosion (>50%)

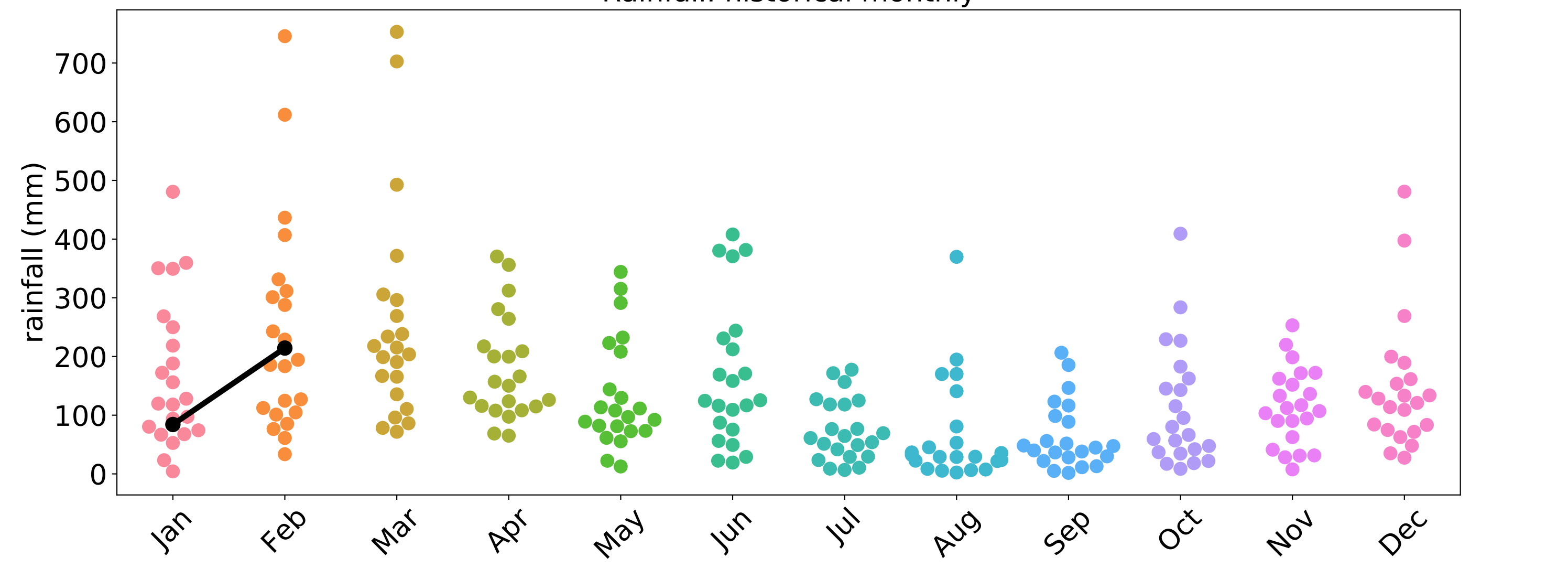
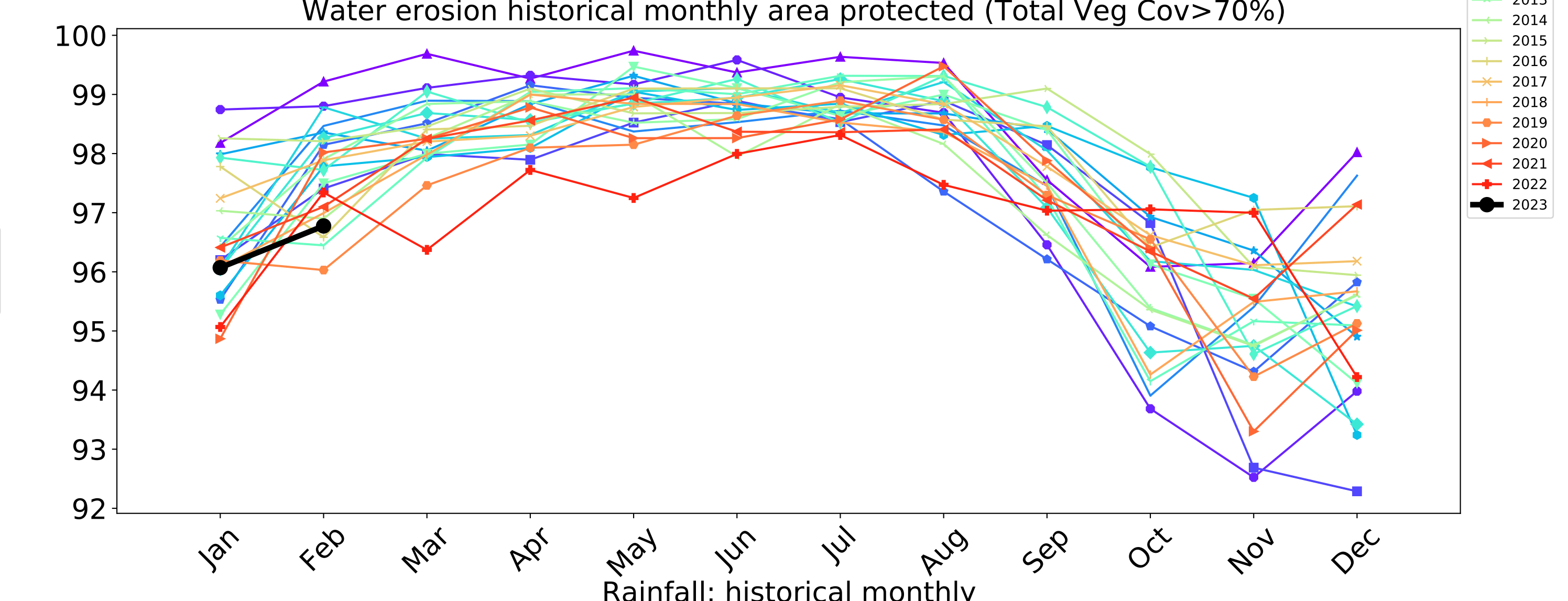
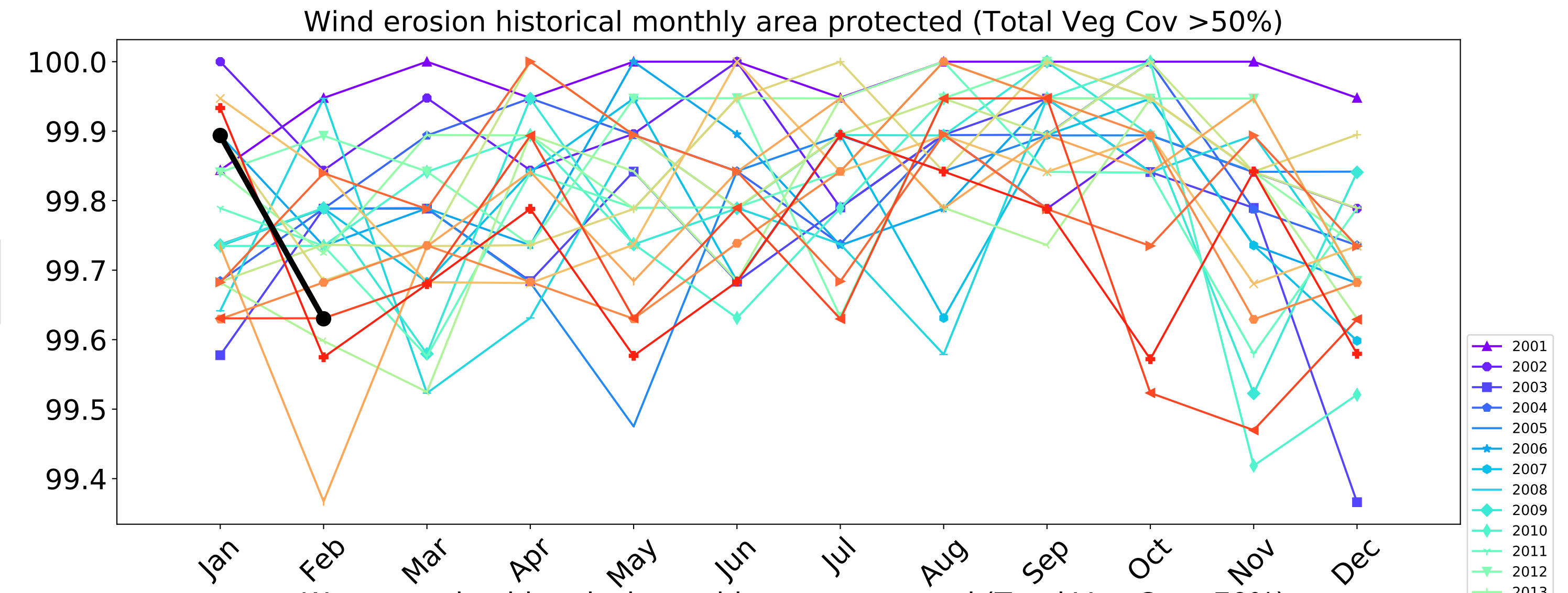
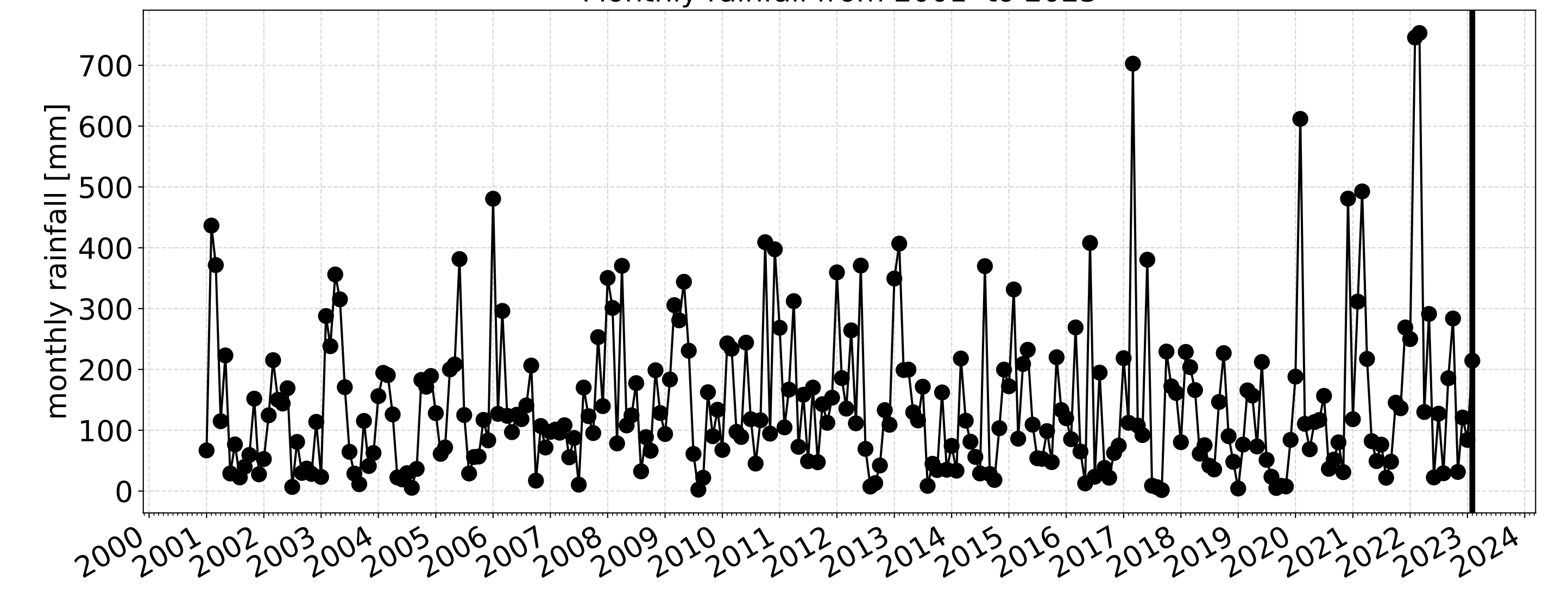
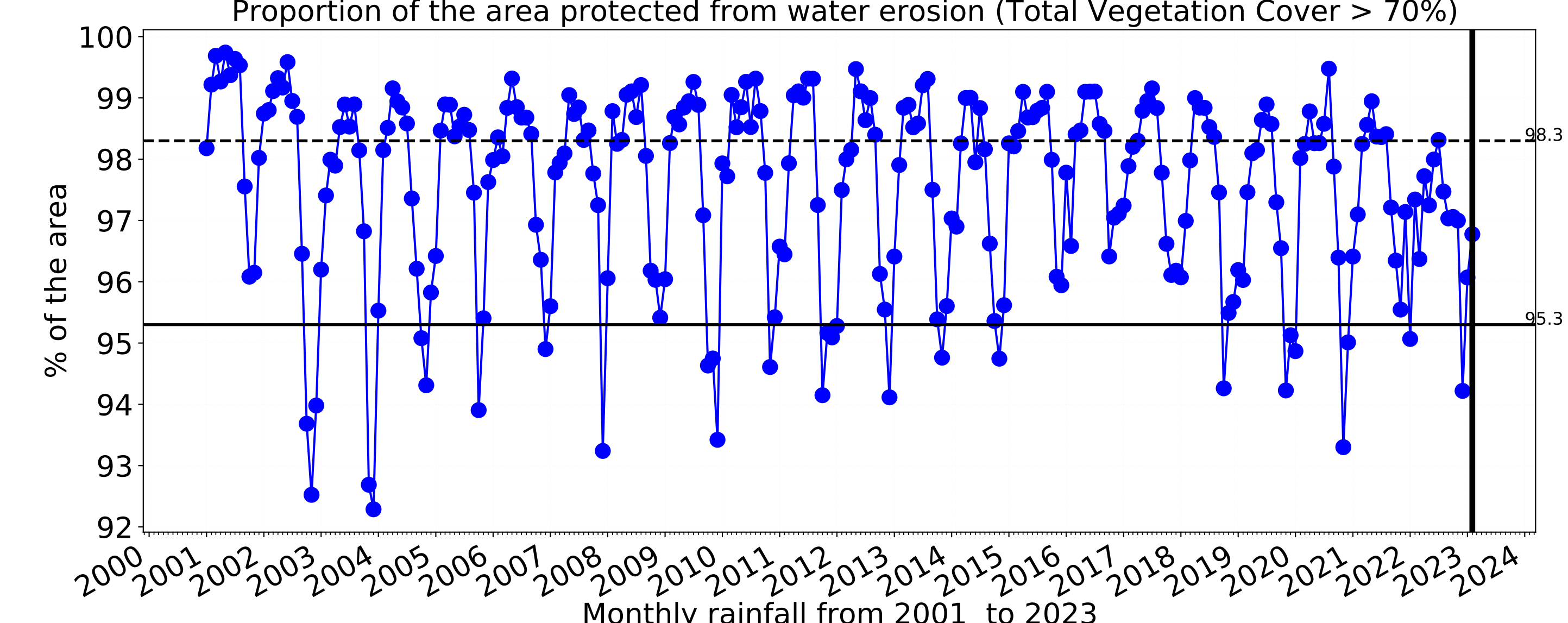
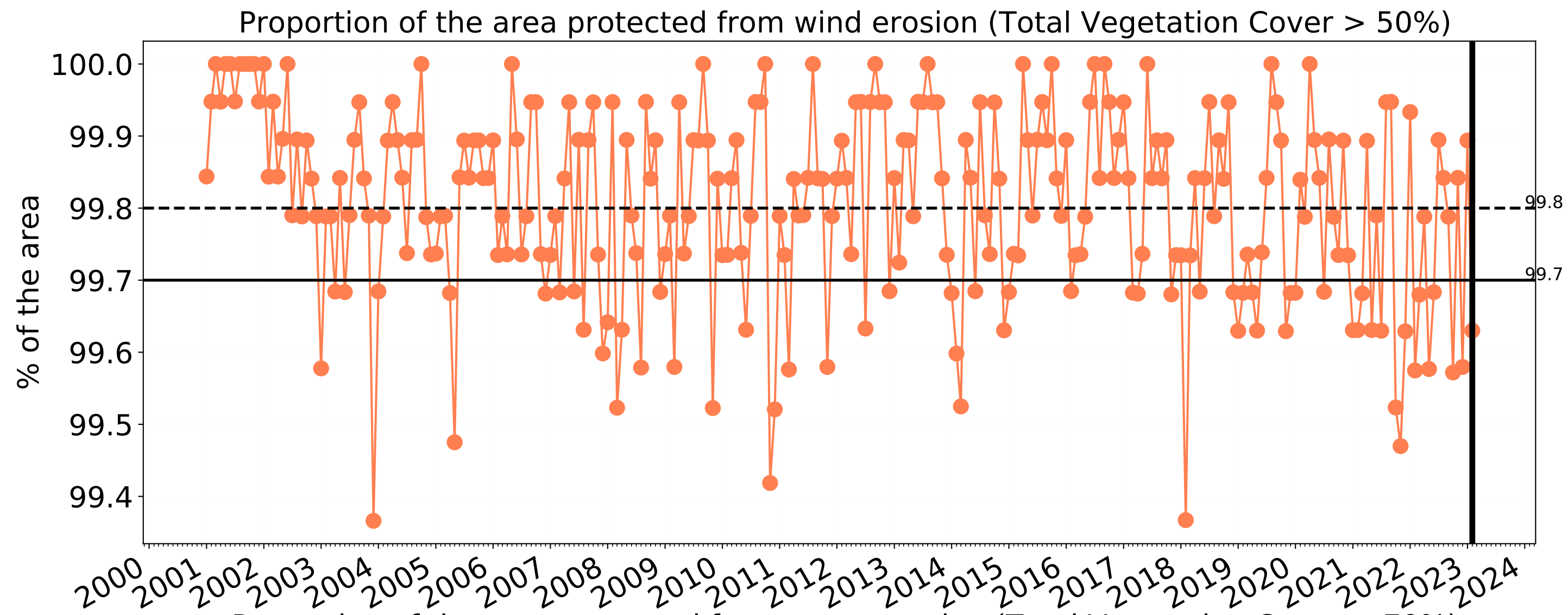


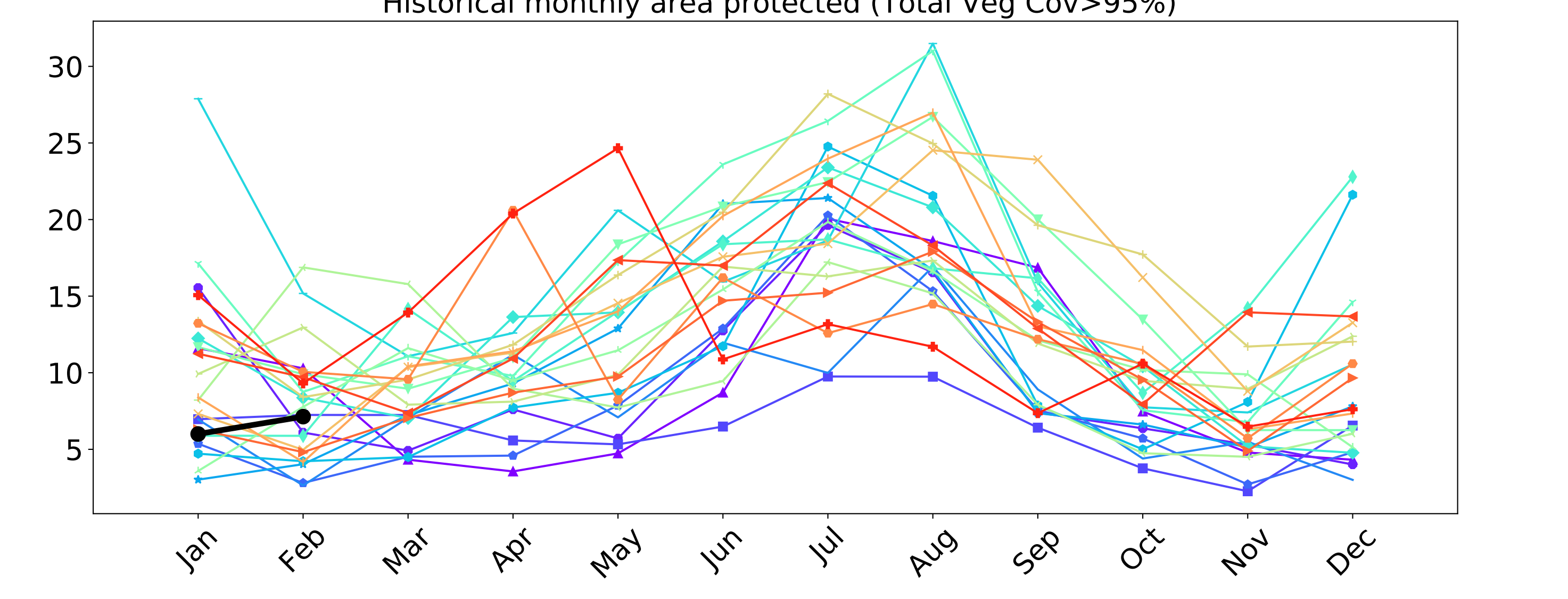
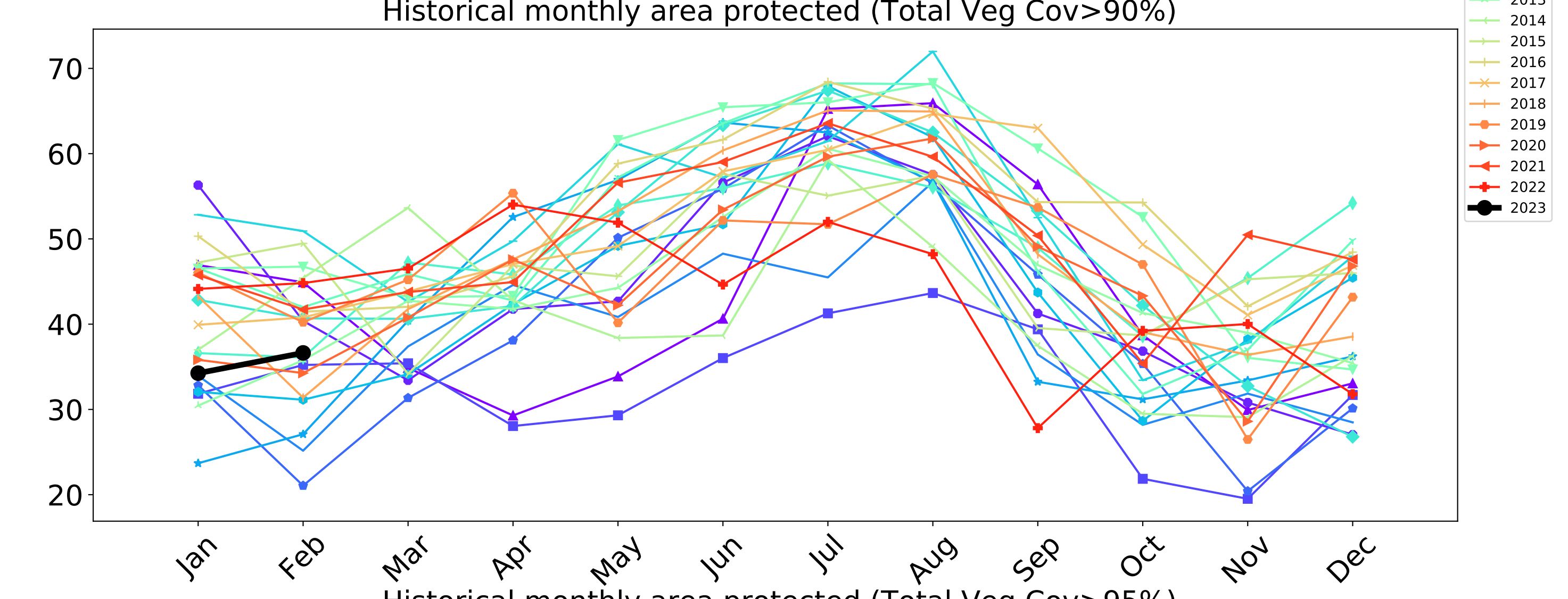
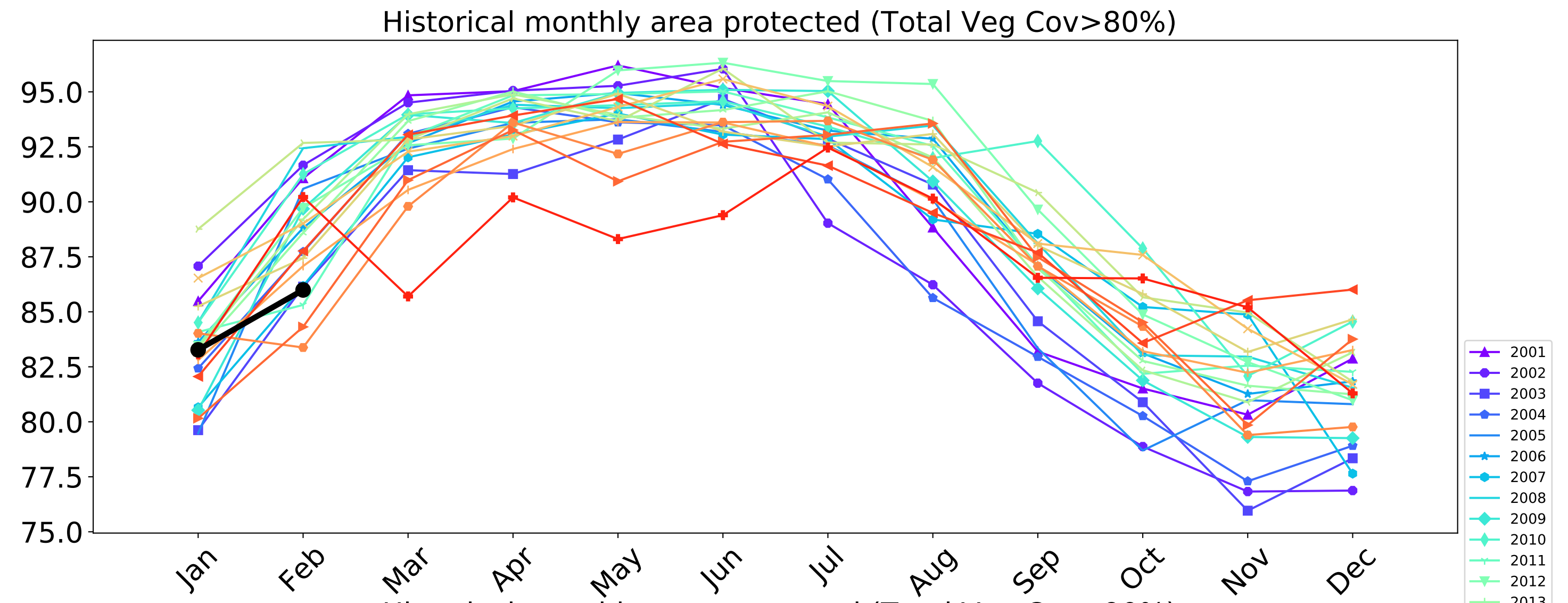
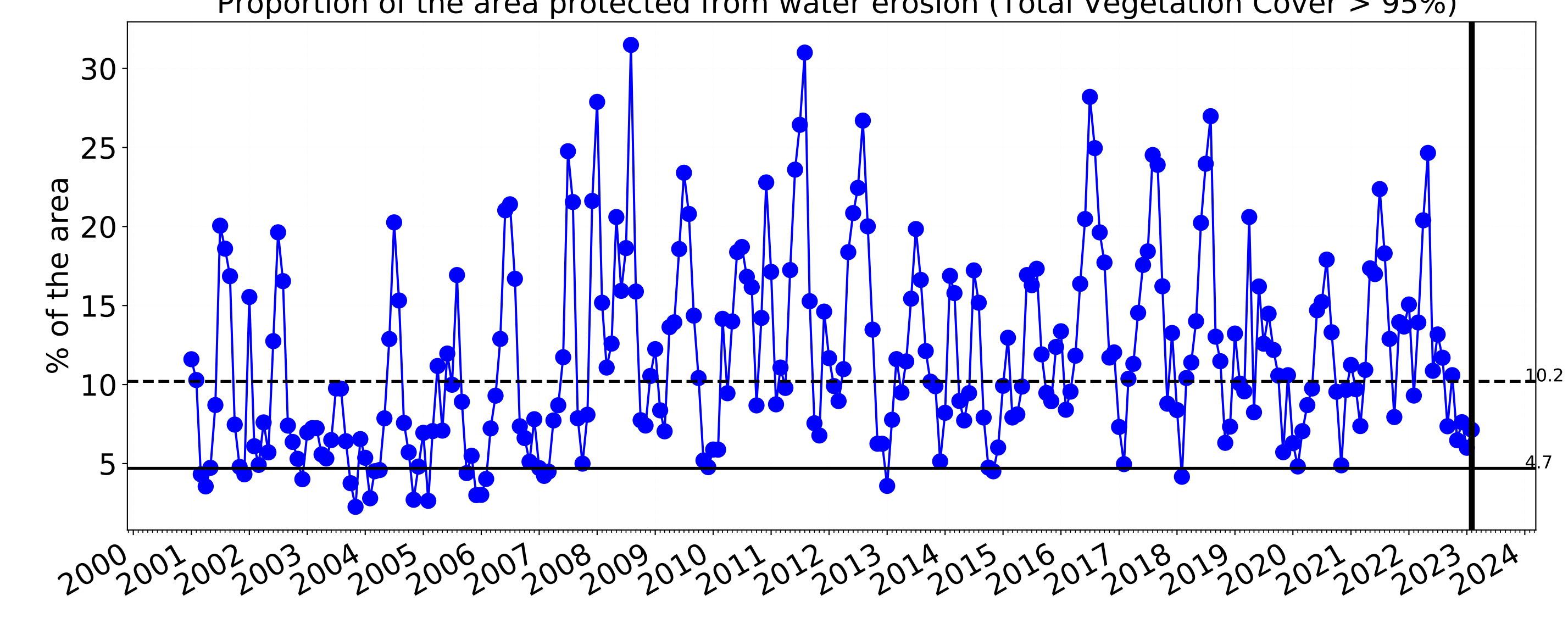
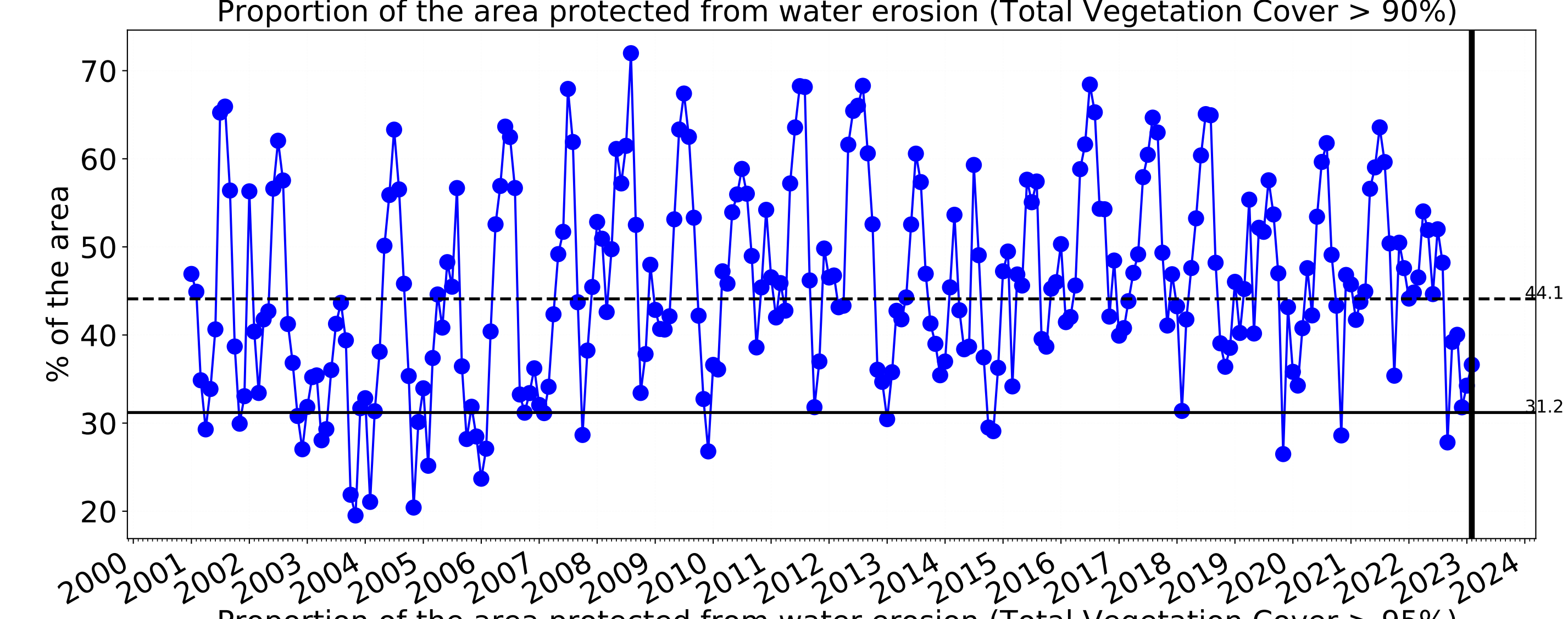
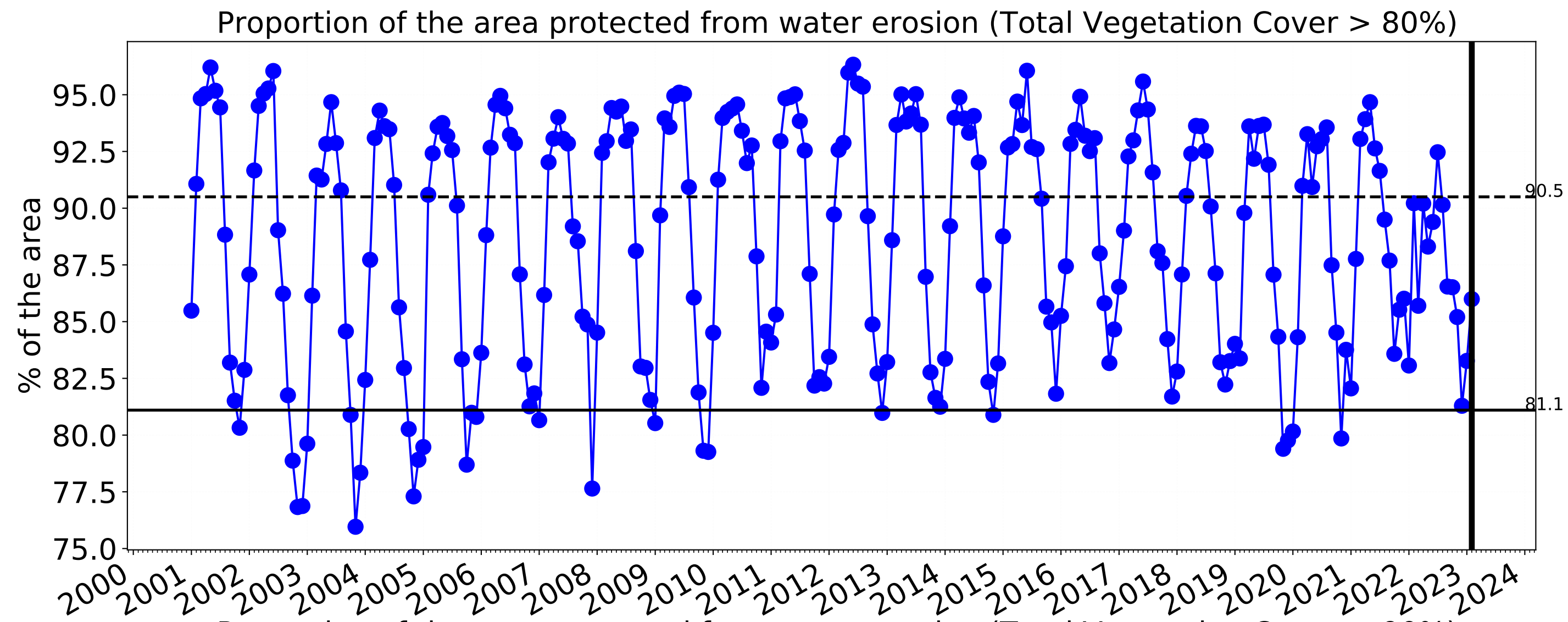
Total Vegetation Cover Anomaly [%]



Total Vegetation Cover Decile [%]





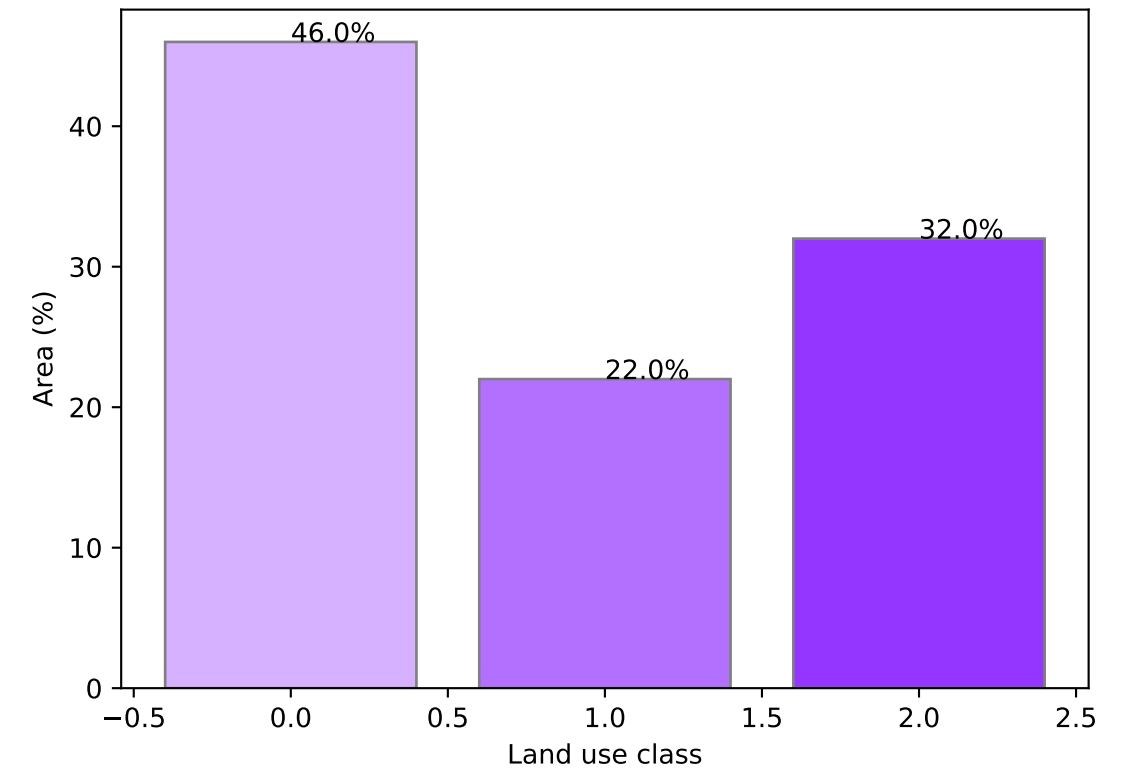


Conservation and natural environments

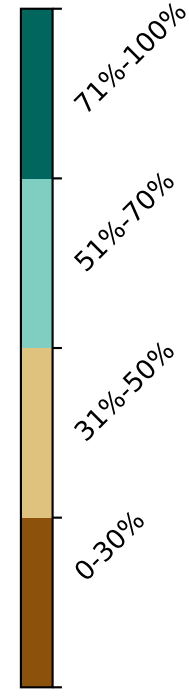
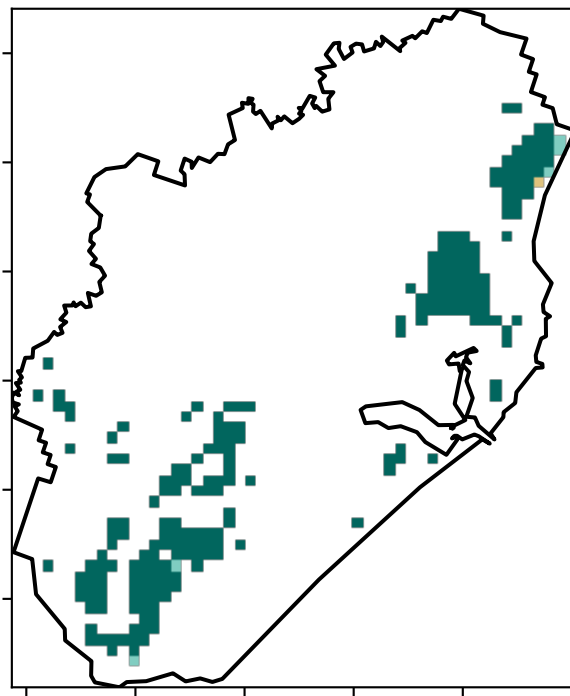
Land use and forest cover



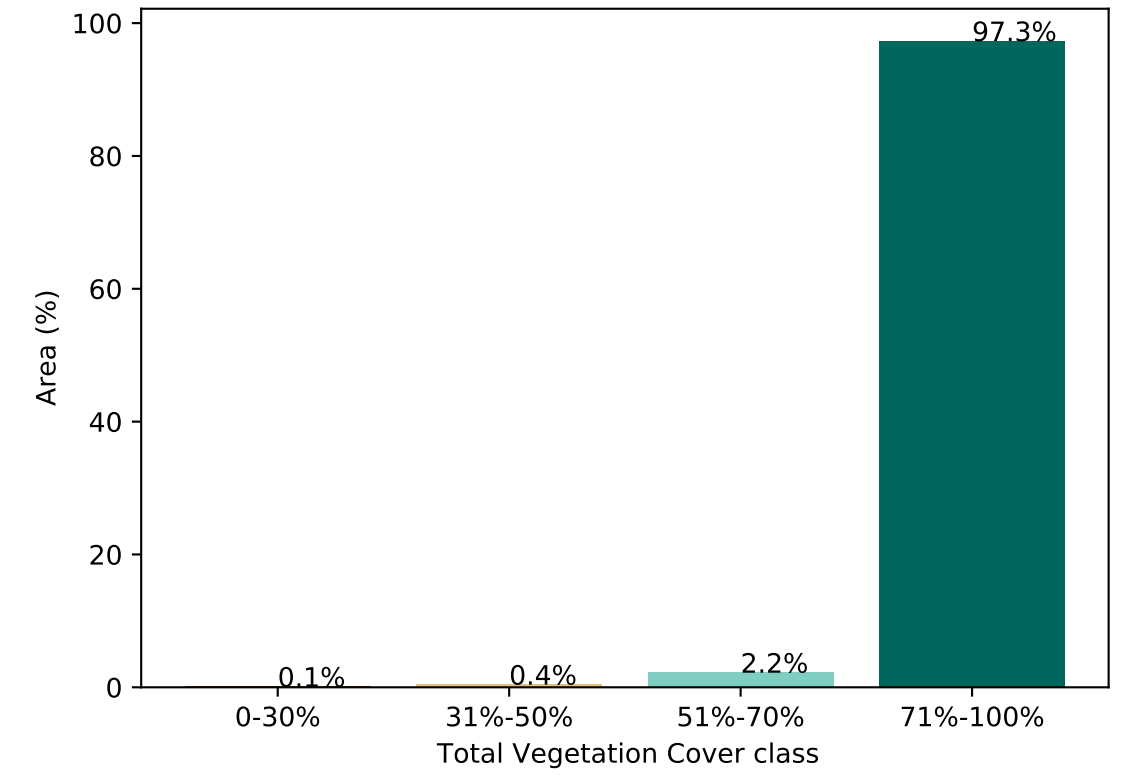
Proportion of each land class in area



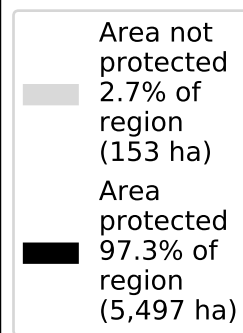
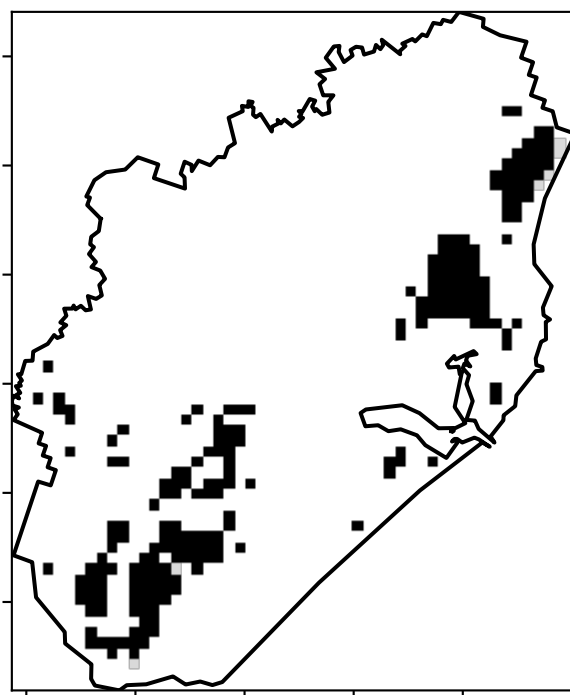
Total Vegetation Cover [%]



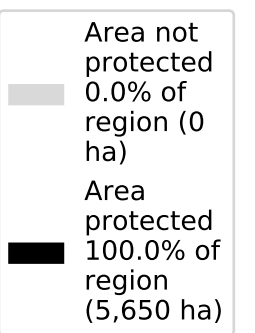
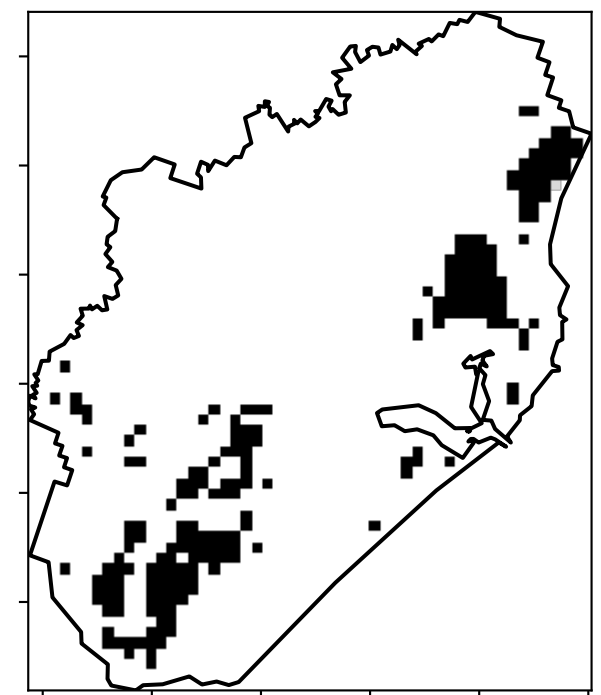
Proportion of vegetation cover class in area



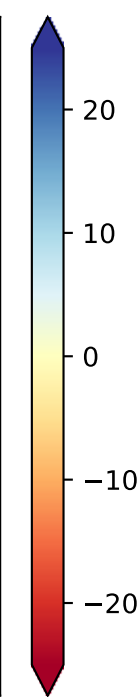
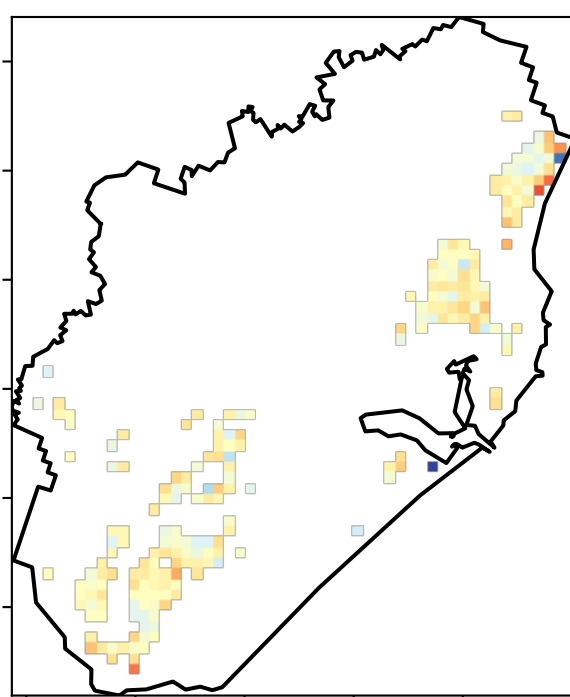
% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)



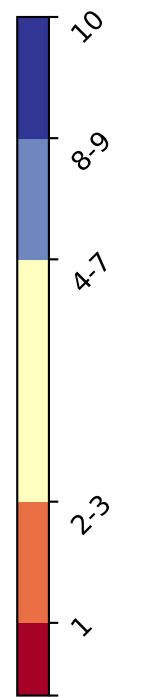
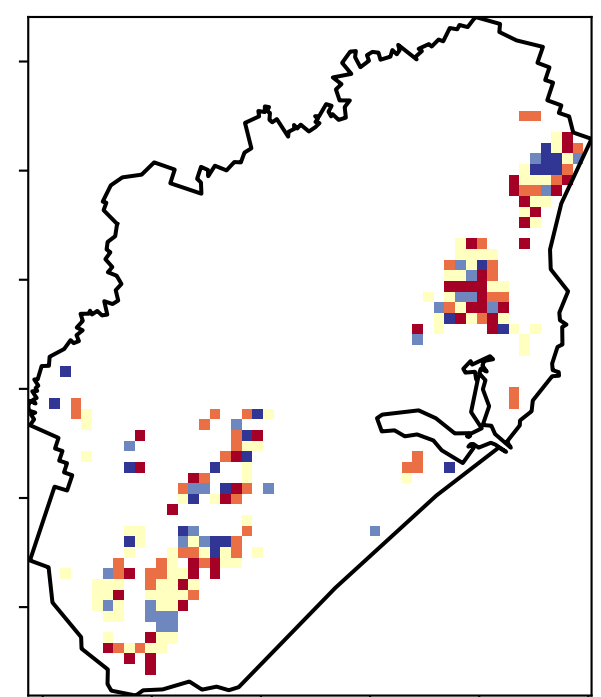
Total Vegetation Cover Anomaly [%]



Anomaly show how many percentage 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 [%]



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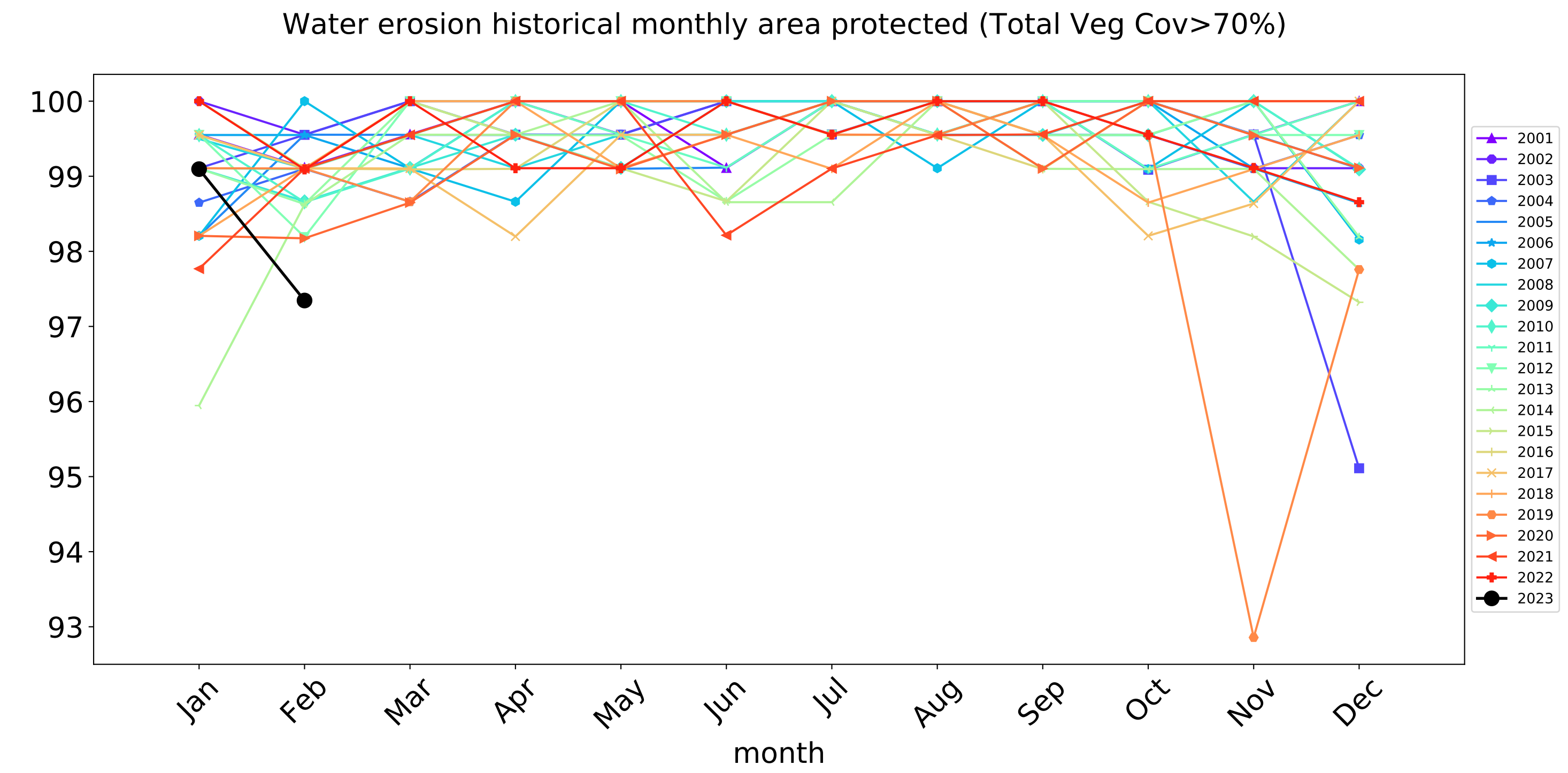
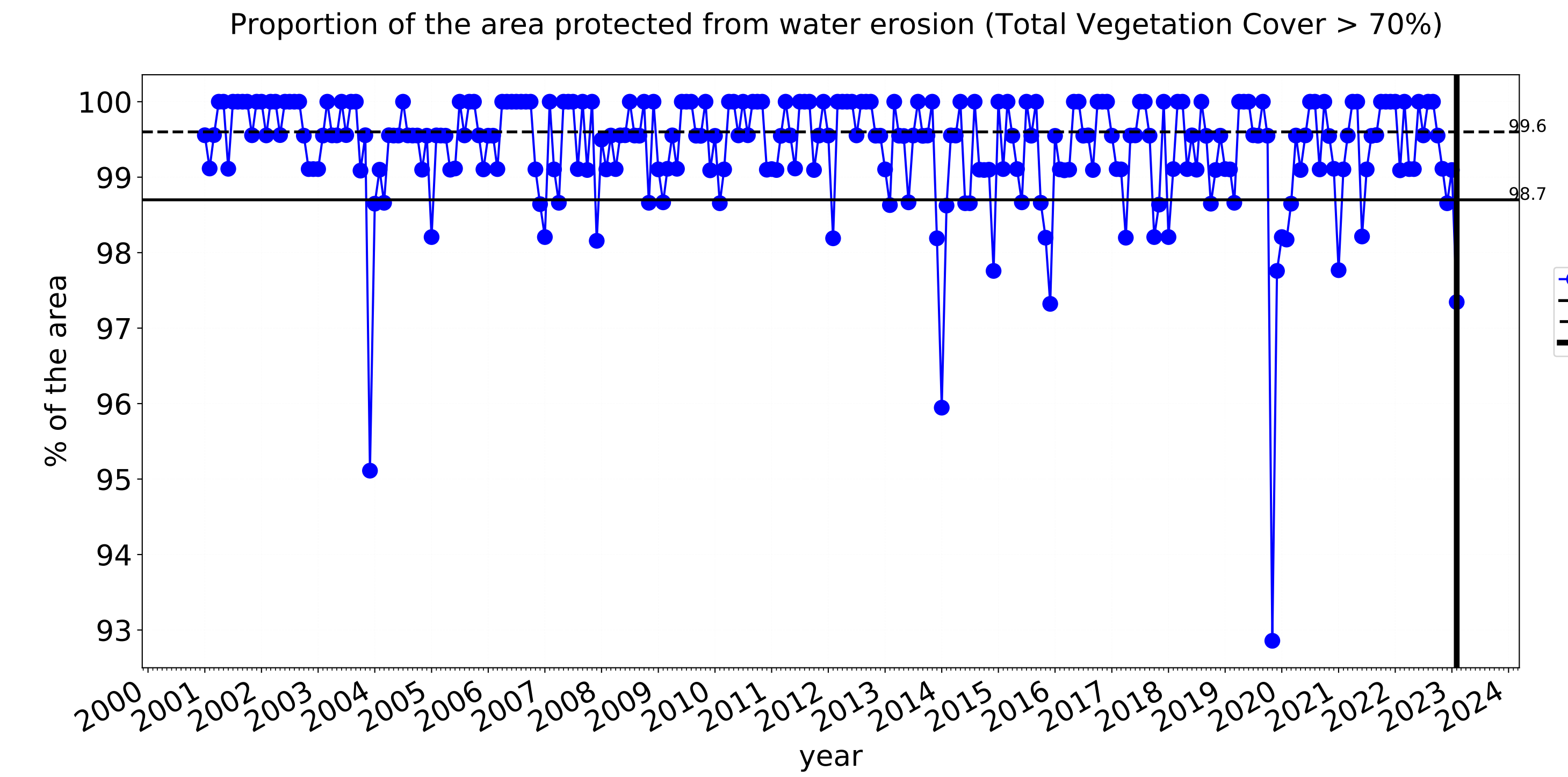
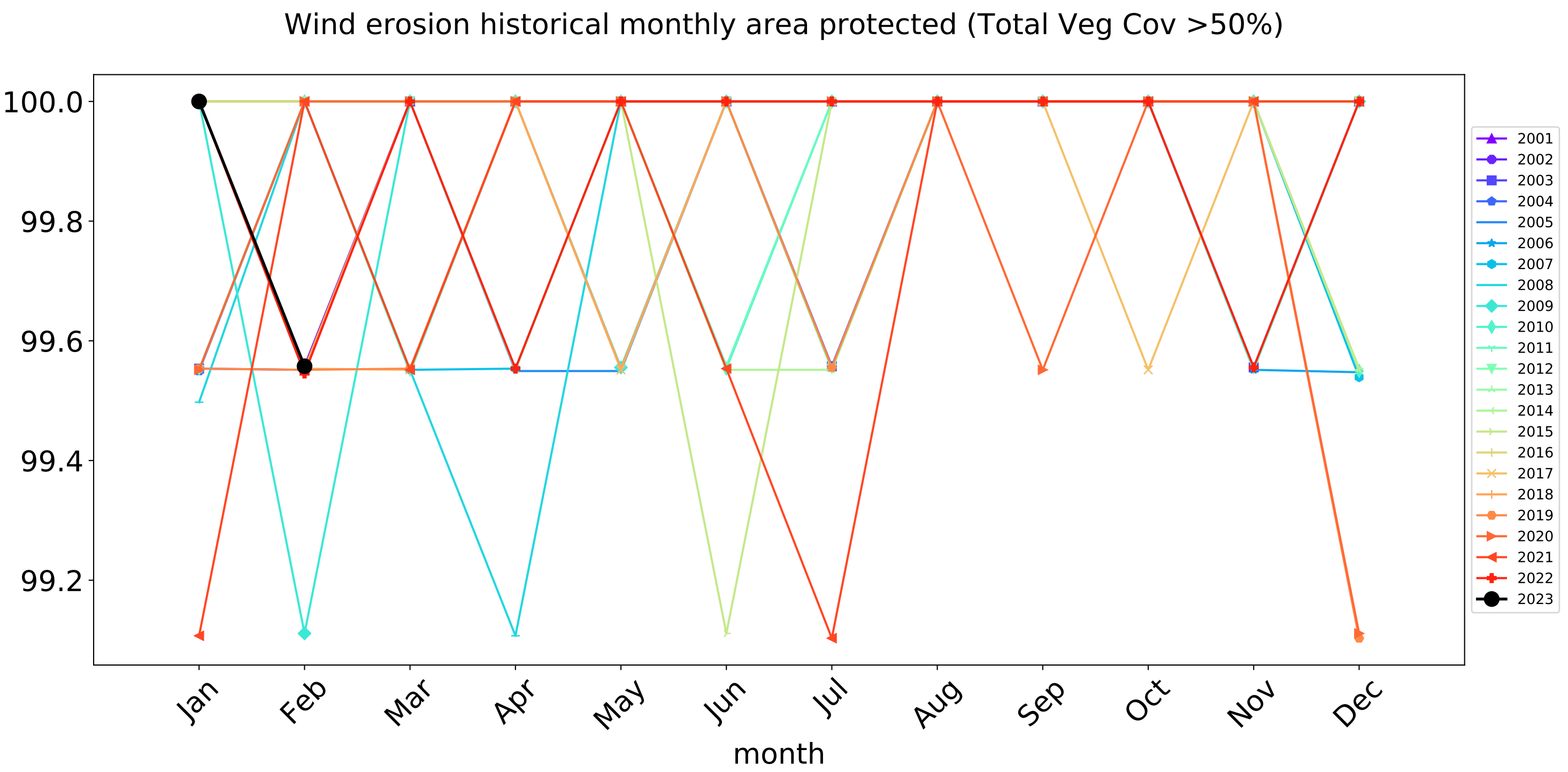
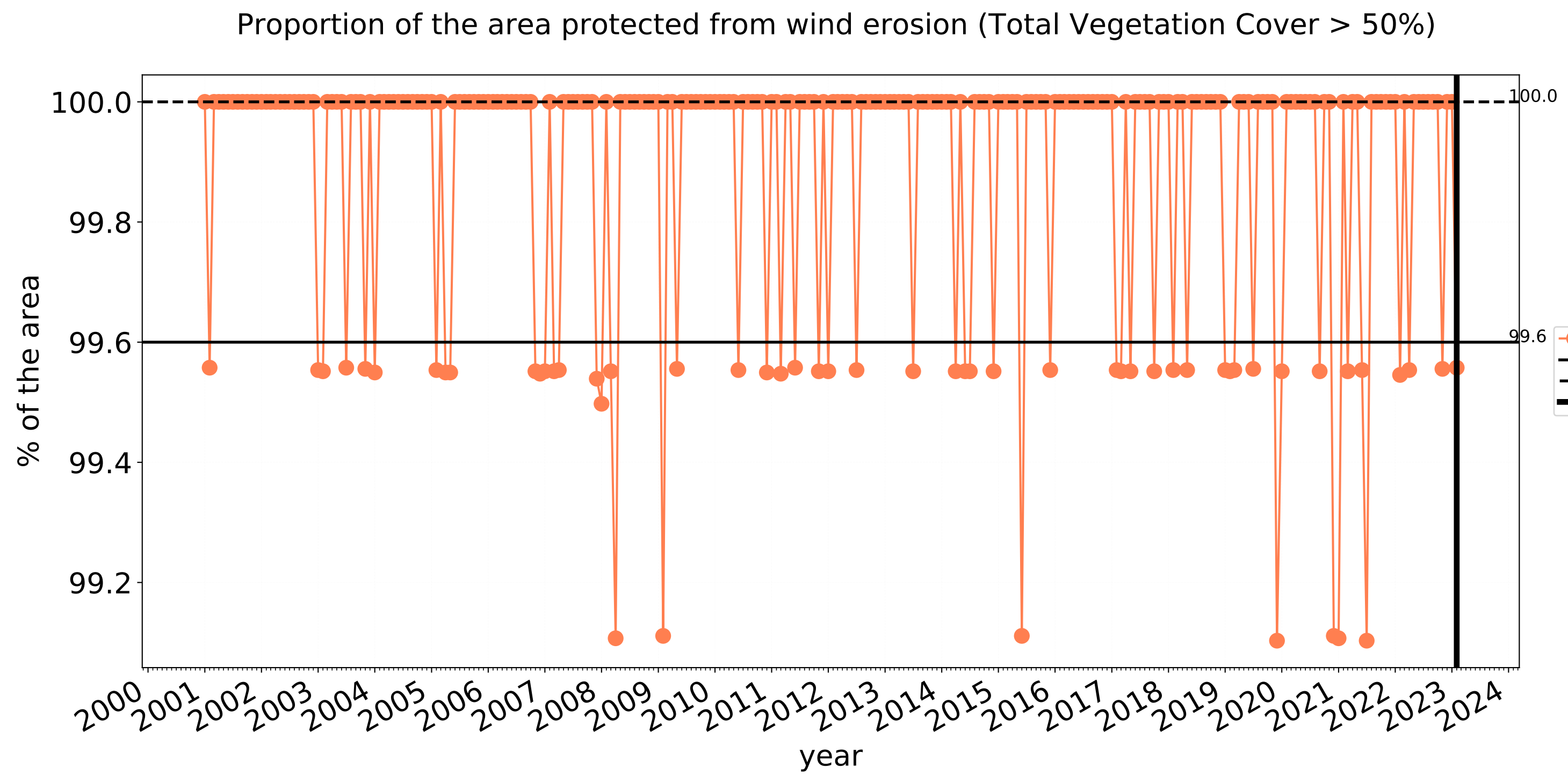


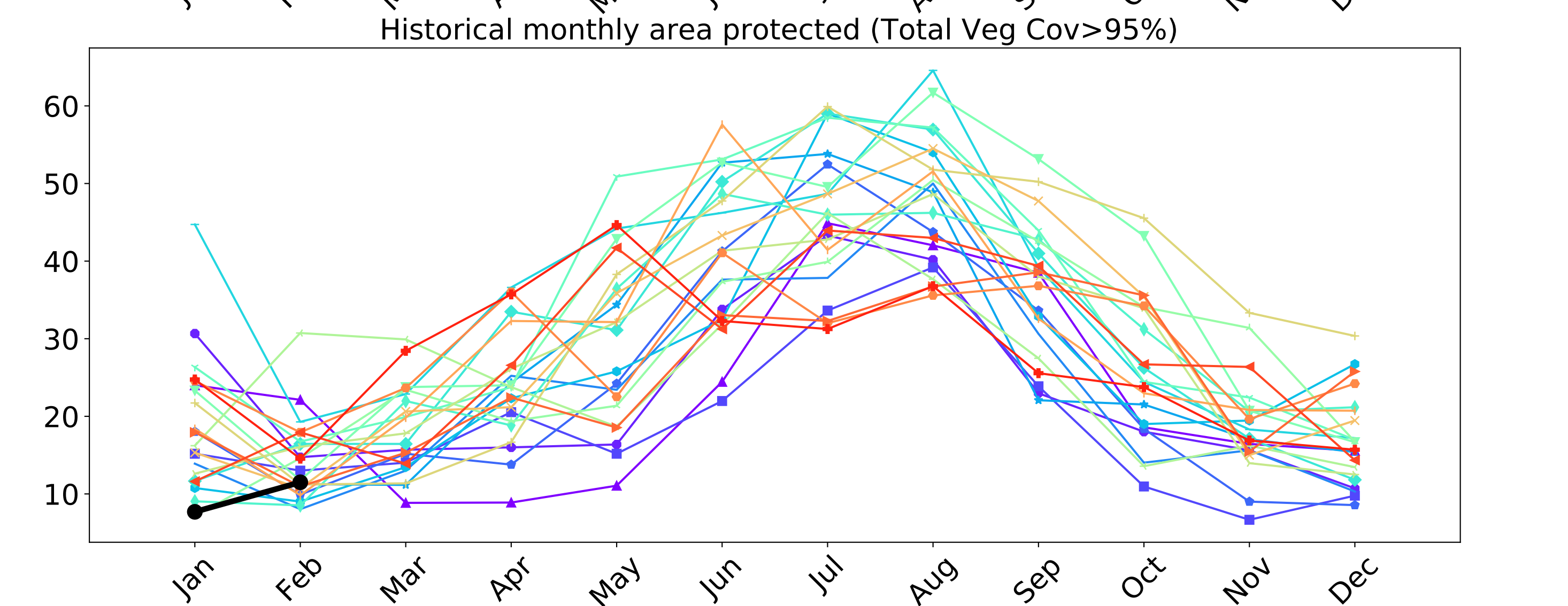
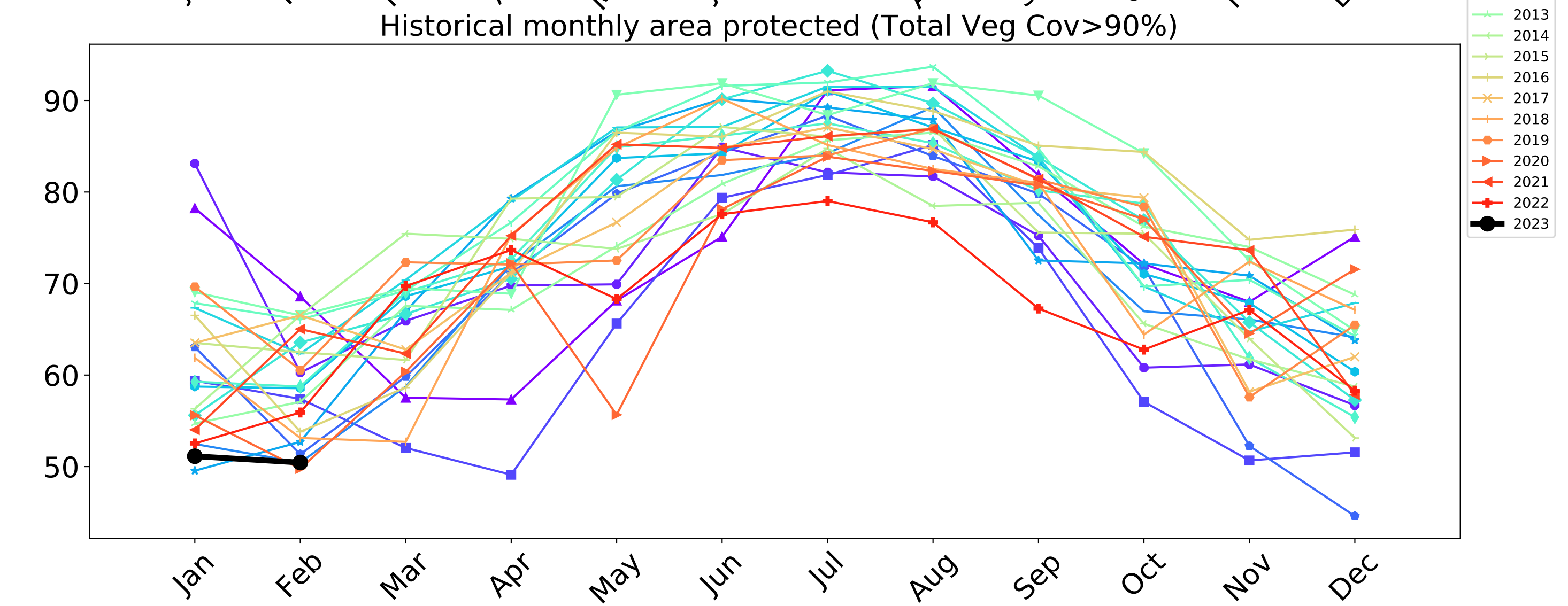
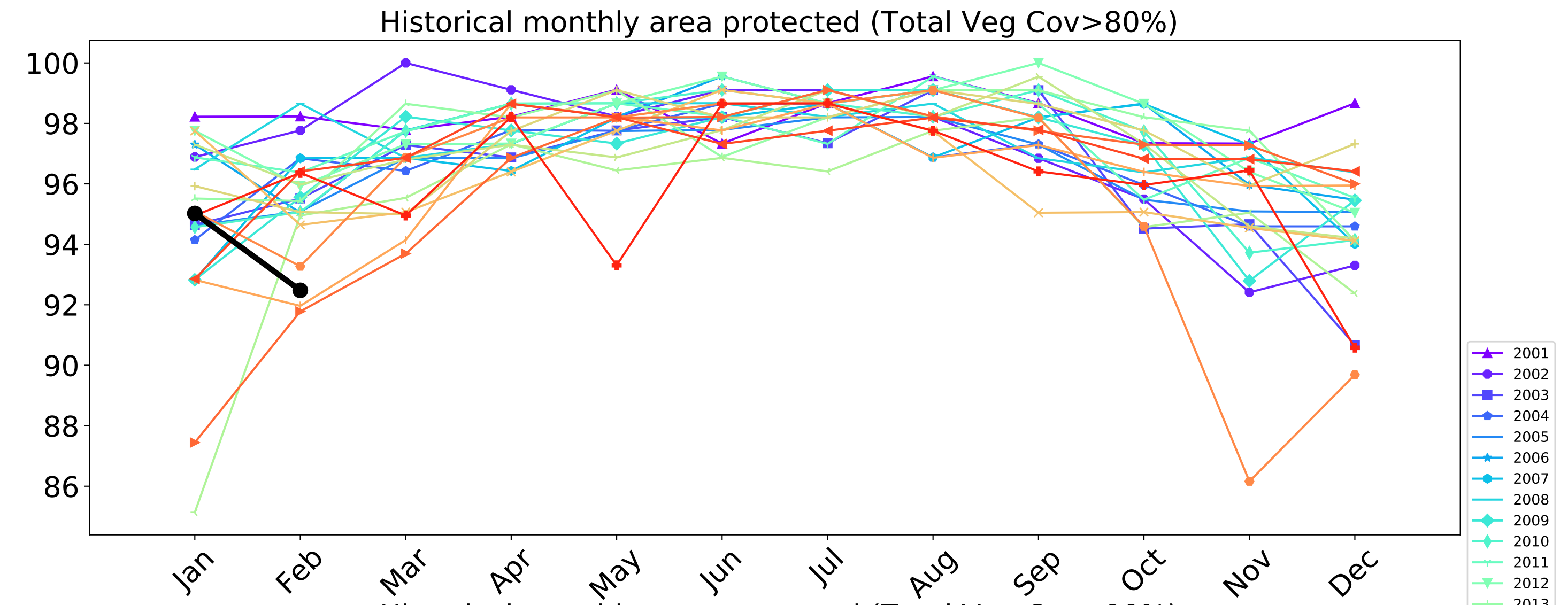
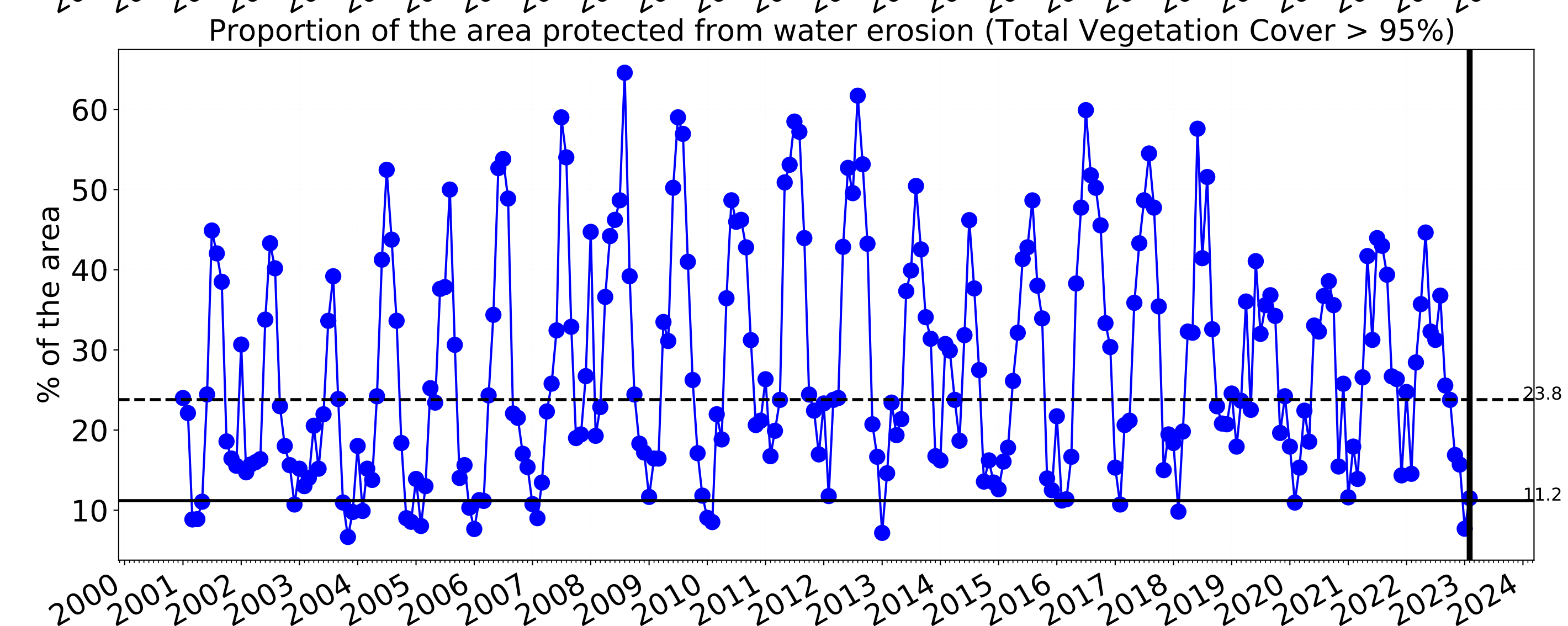
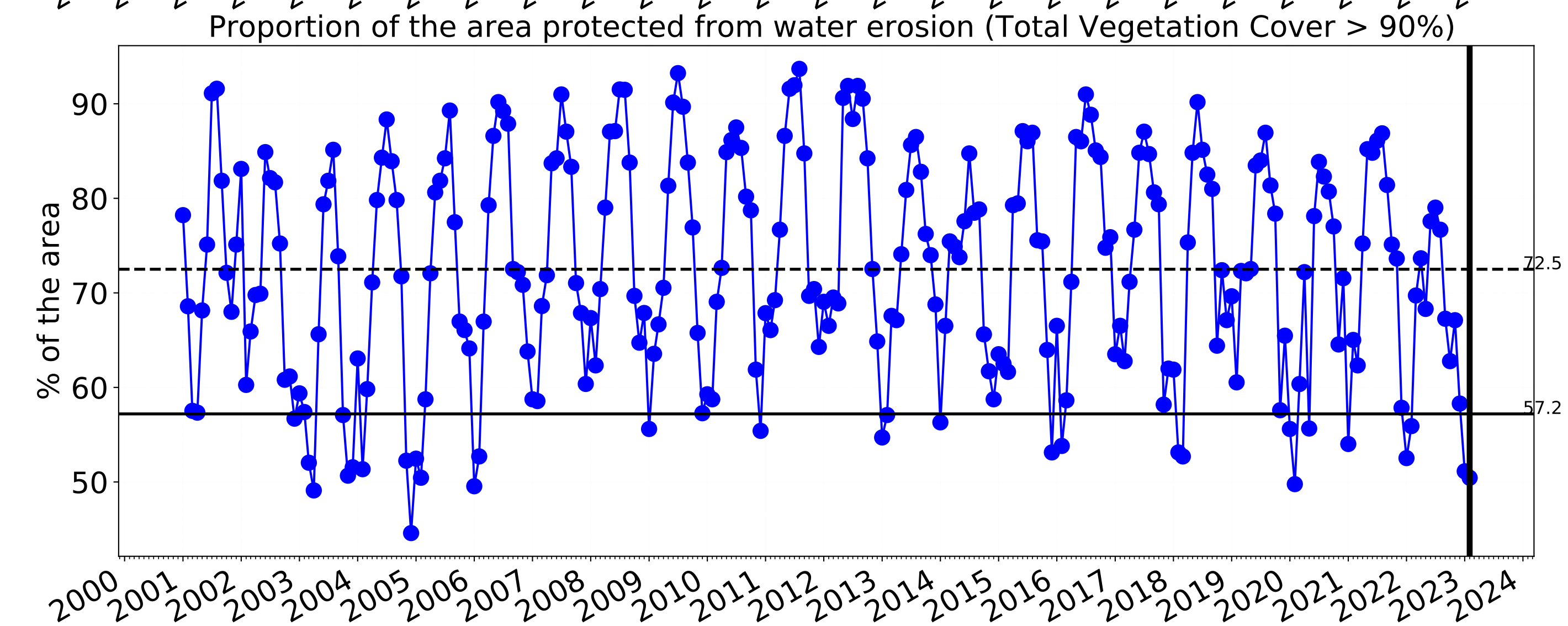
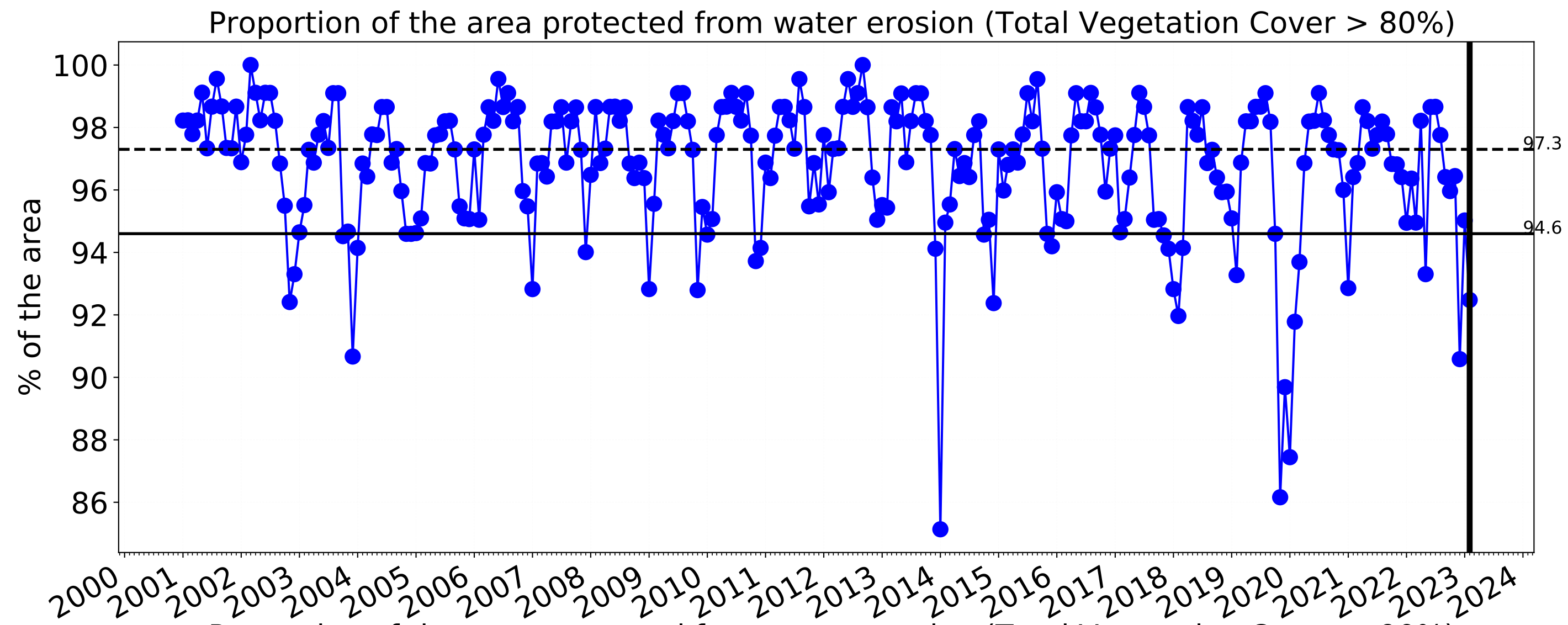
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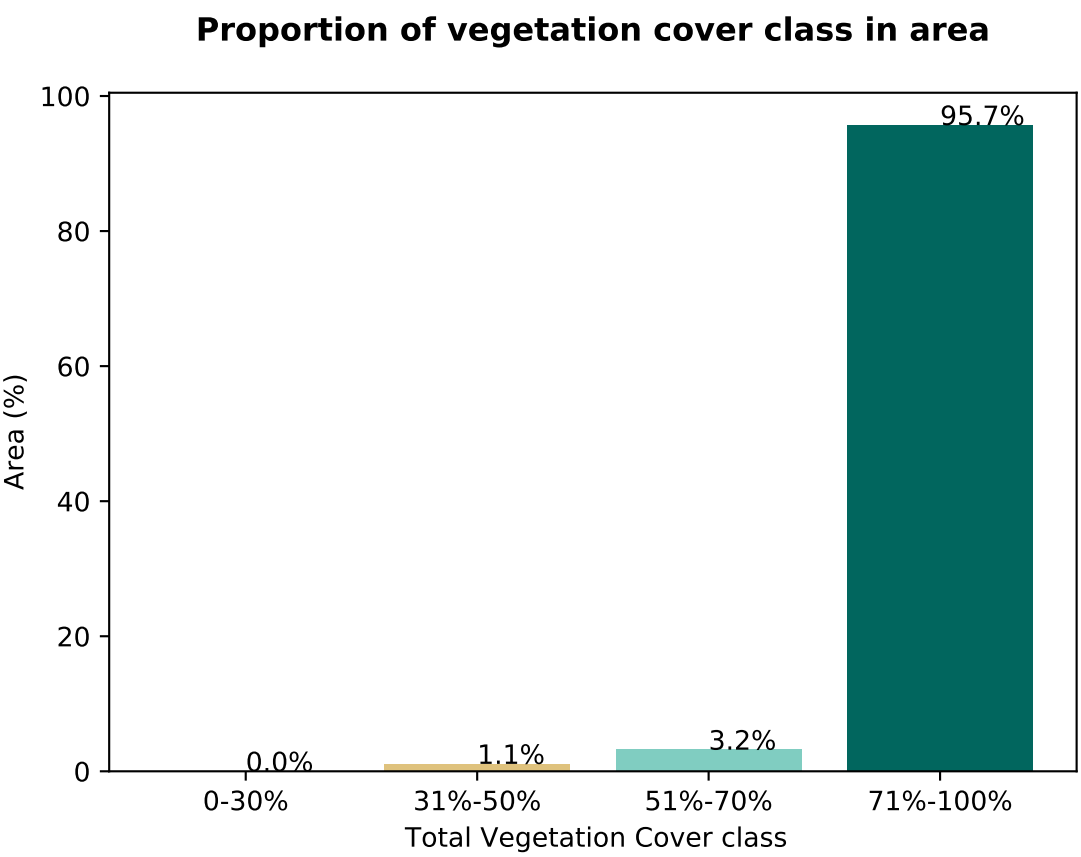
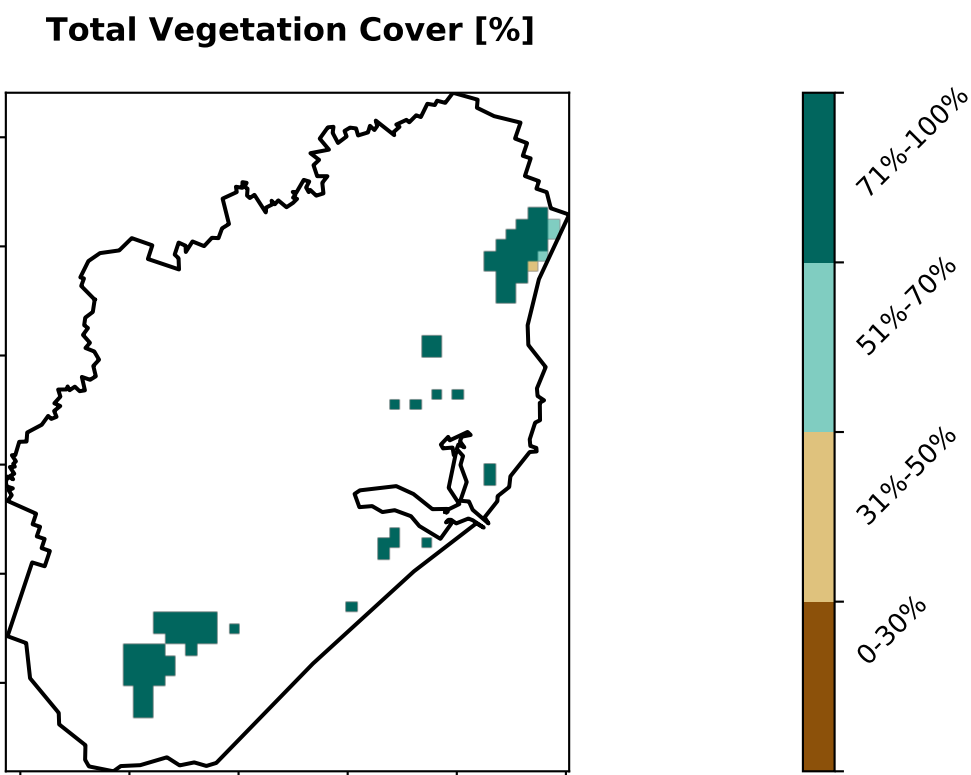
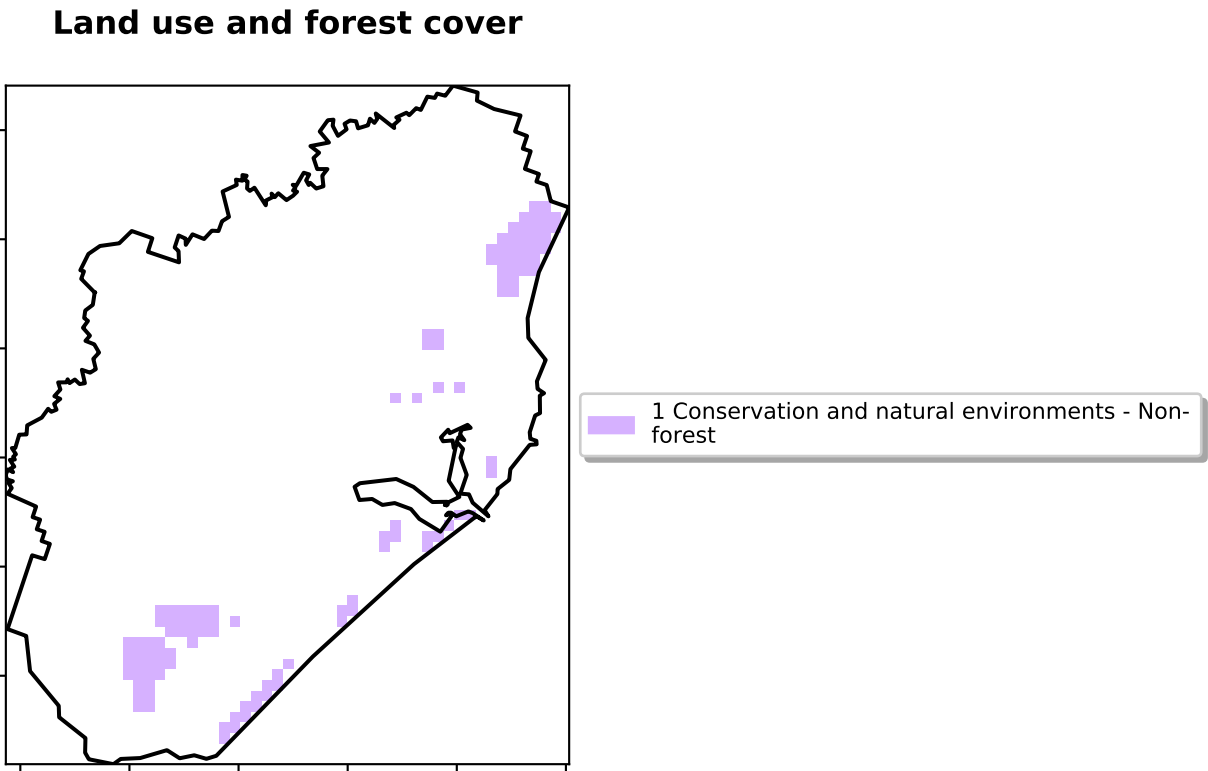
Conservation and natural environments timeseries



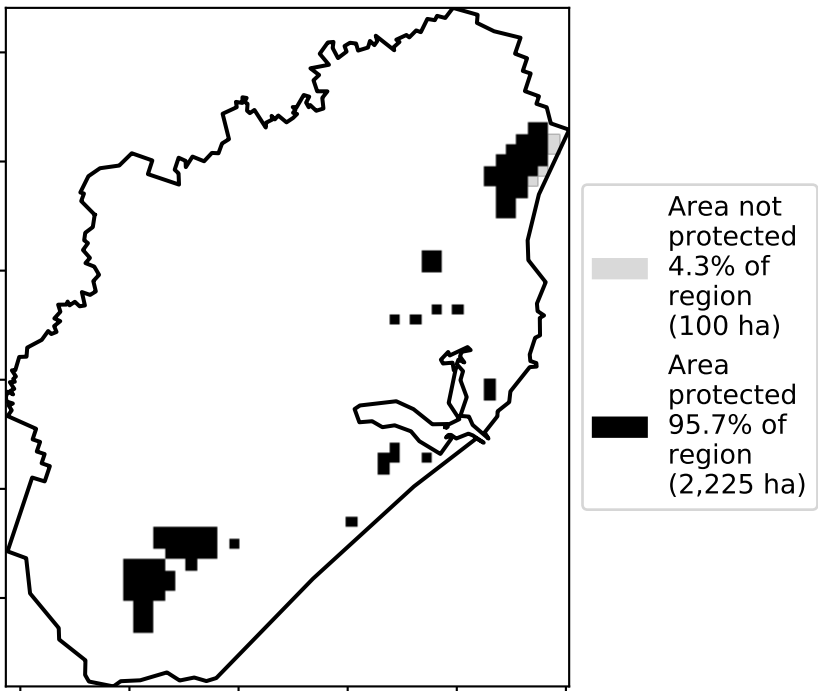


Conservation and natural environments non forest

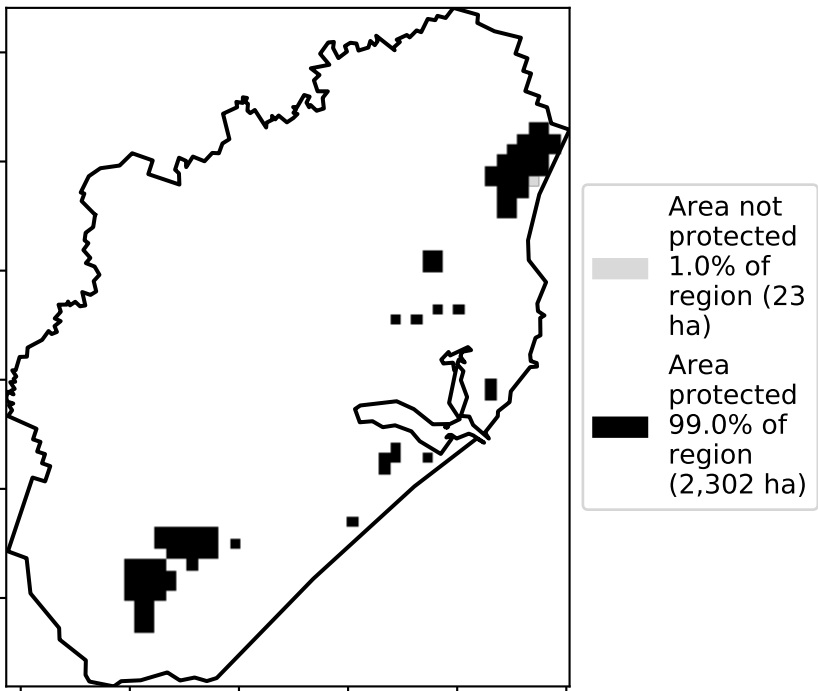
Catchment Scale
Land Use and Forests
of Australia (2018)
Derived from
Catchment Scale Land
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of Australia (2018)



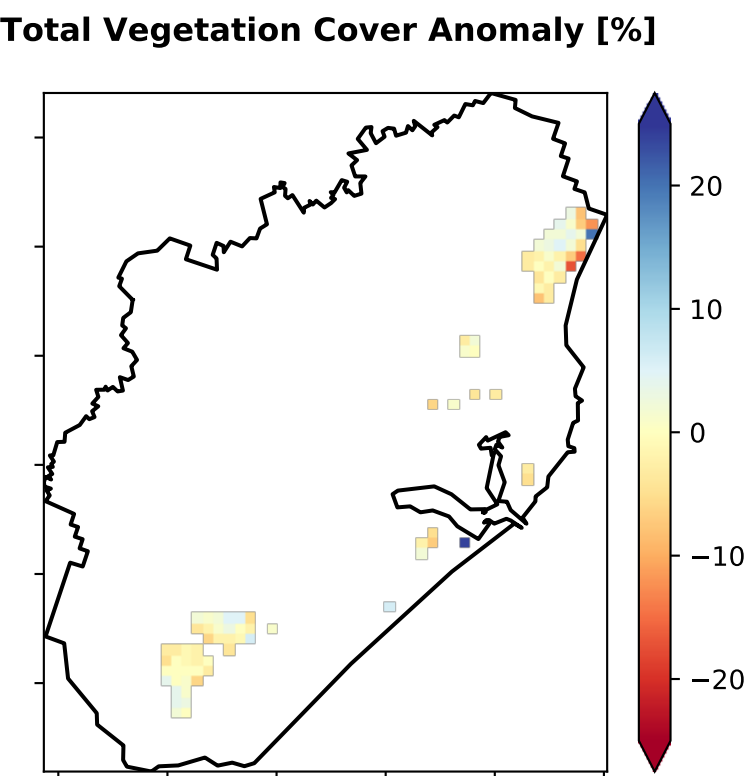
% Area protected from water erosion (>70%)



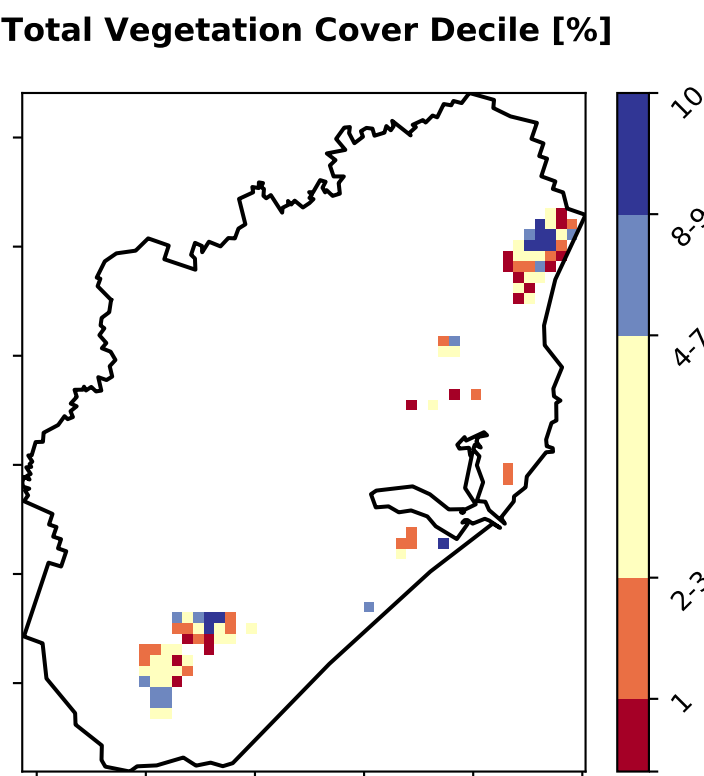
% Area protected from wind erosion (>50%)



Anomaly show how many percentage 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.

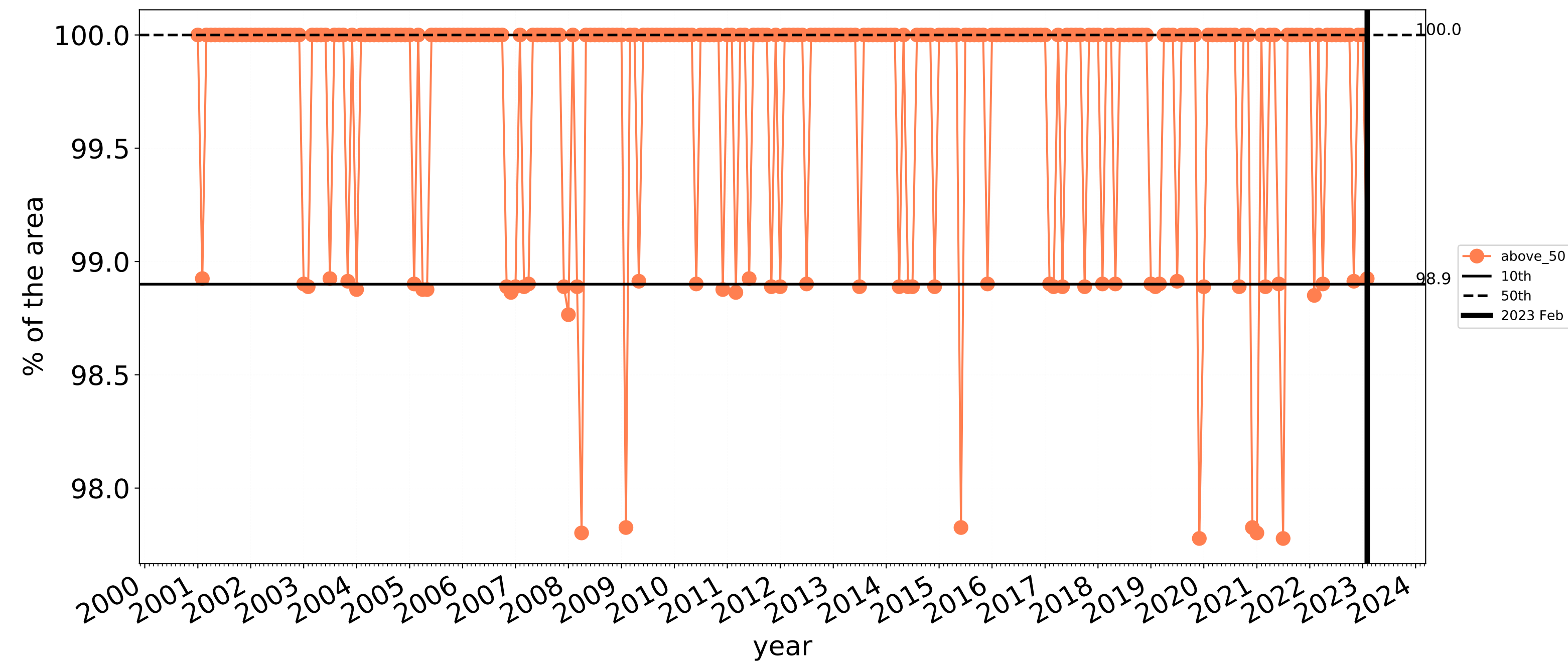


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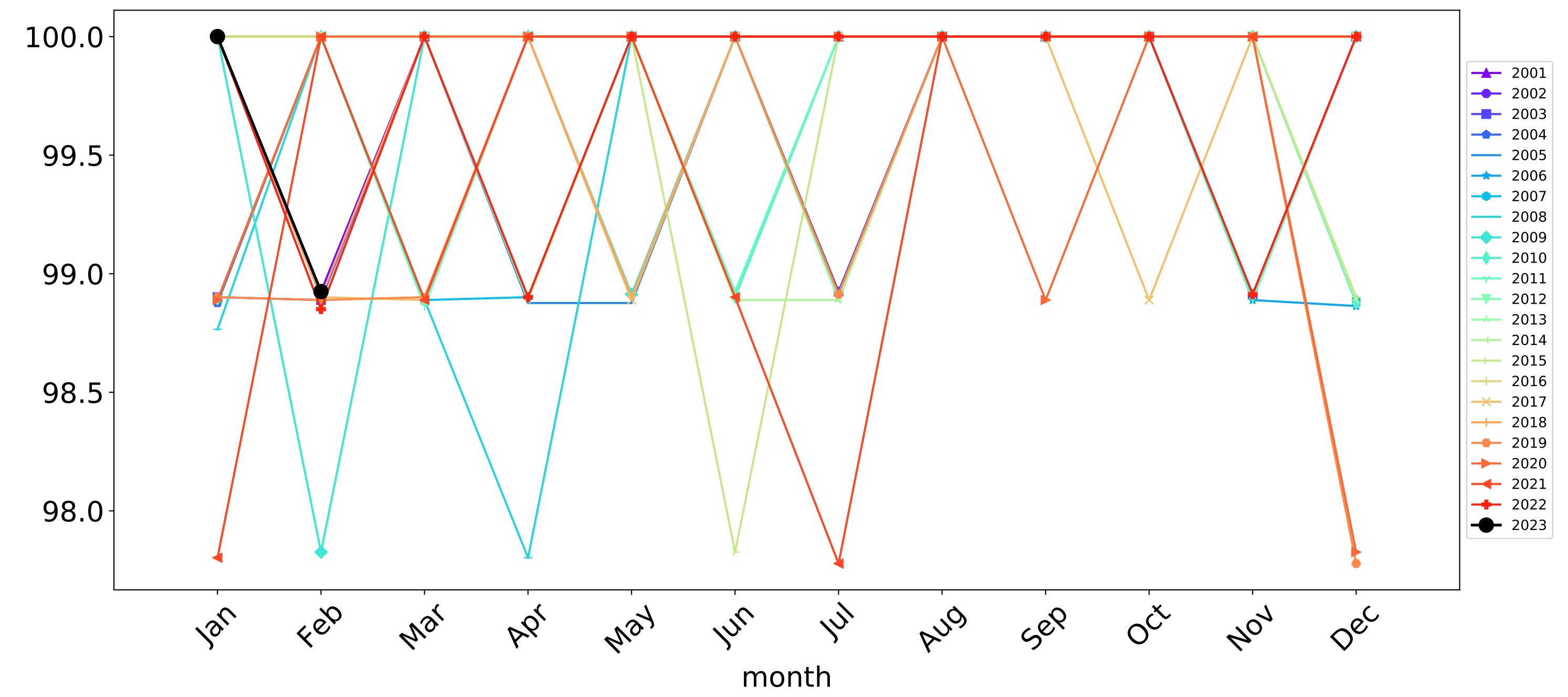


Conservation and natural environments non forest timeseries

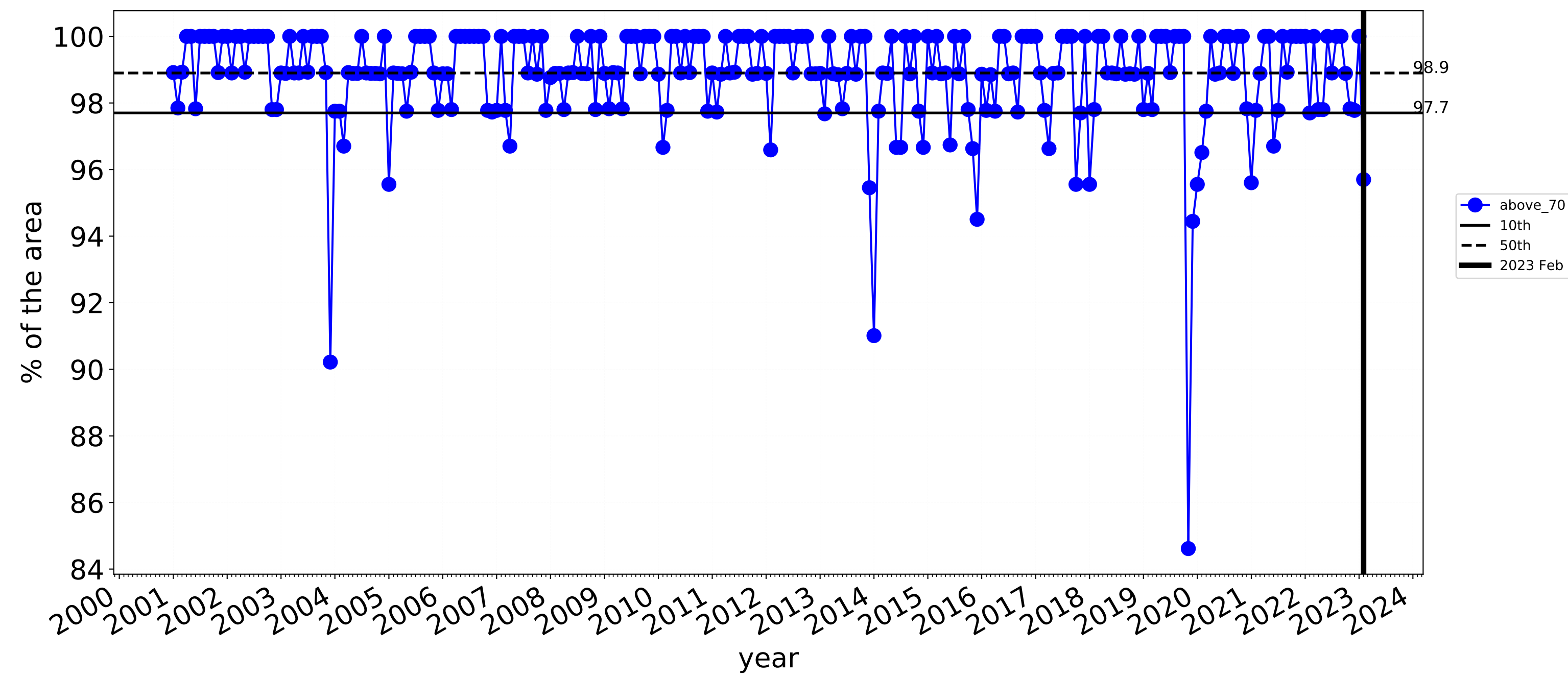
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



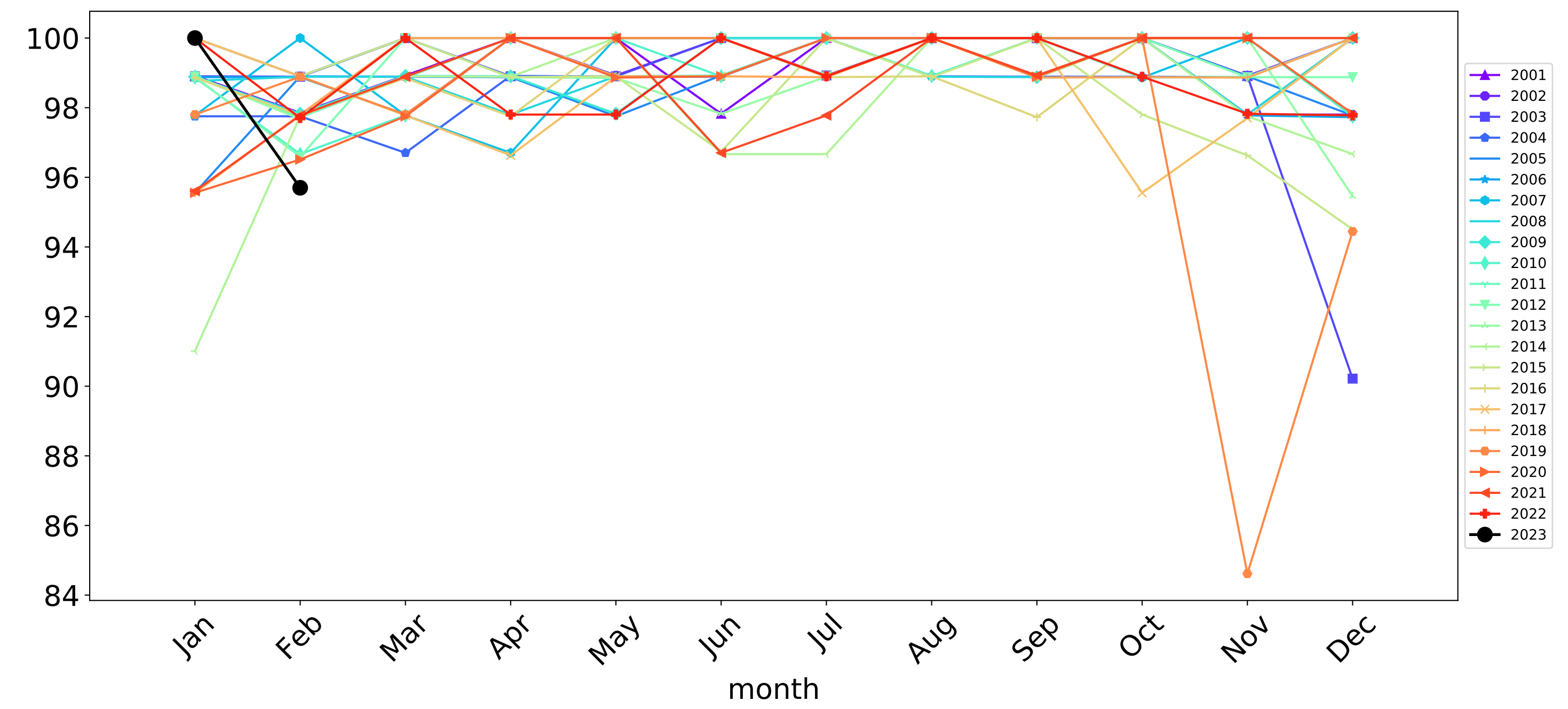
Wind erosion historical monthly area protected (Total Veg Cov >50%)

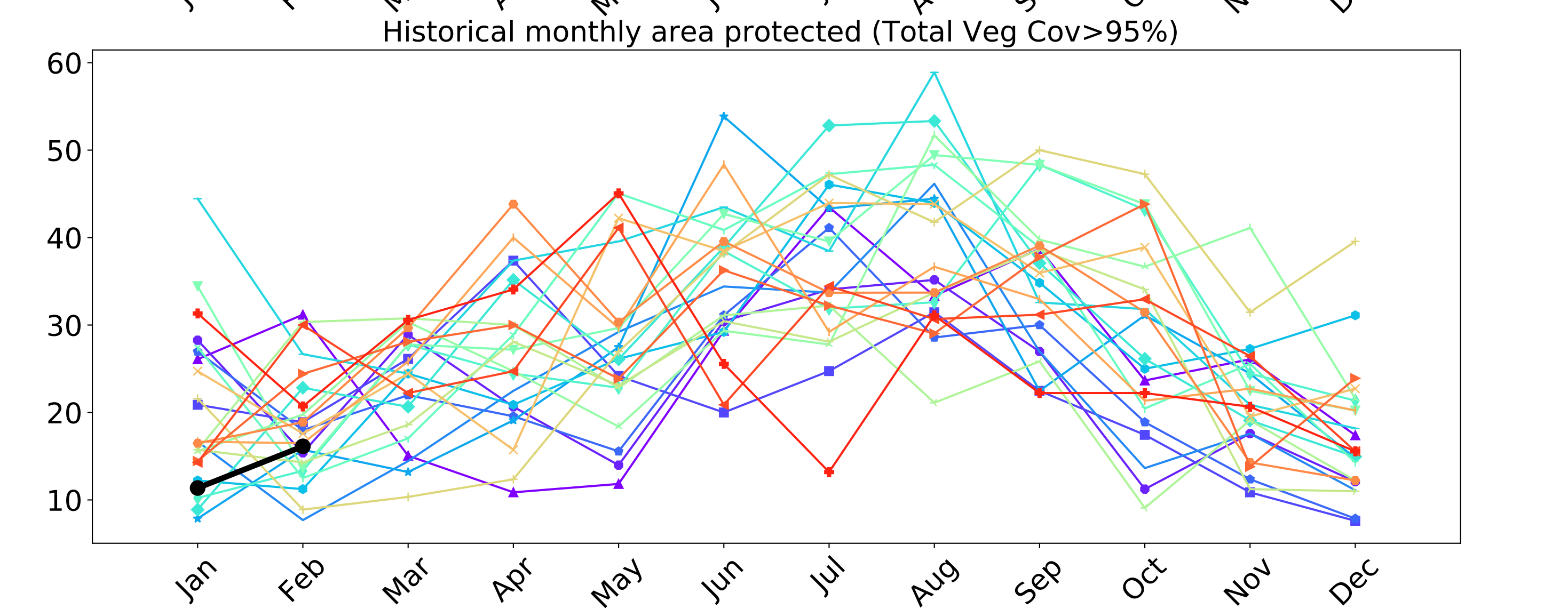
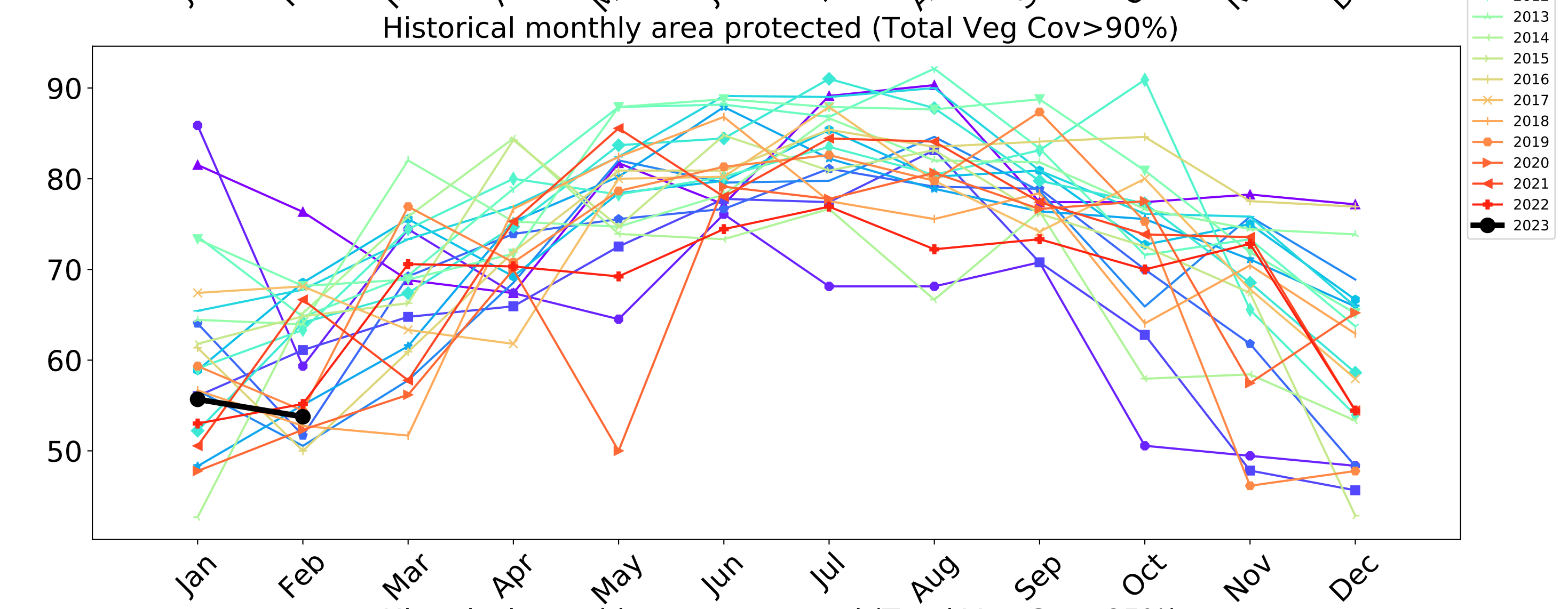
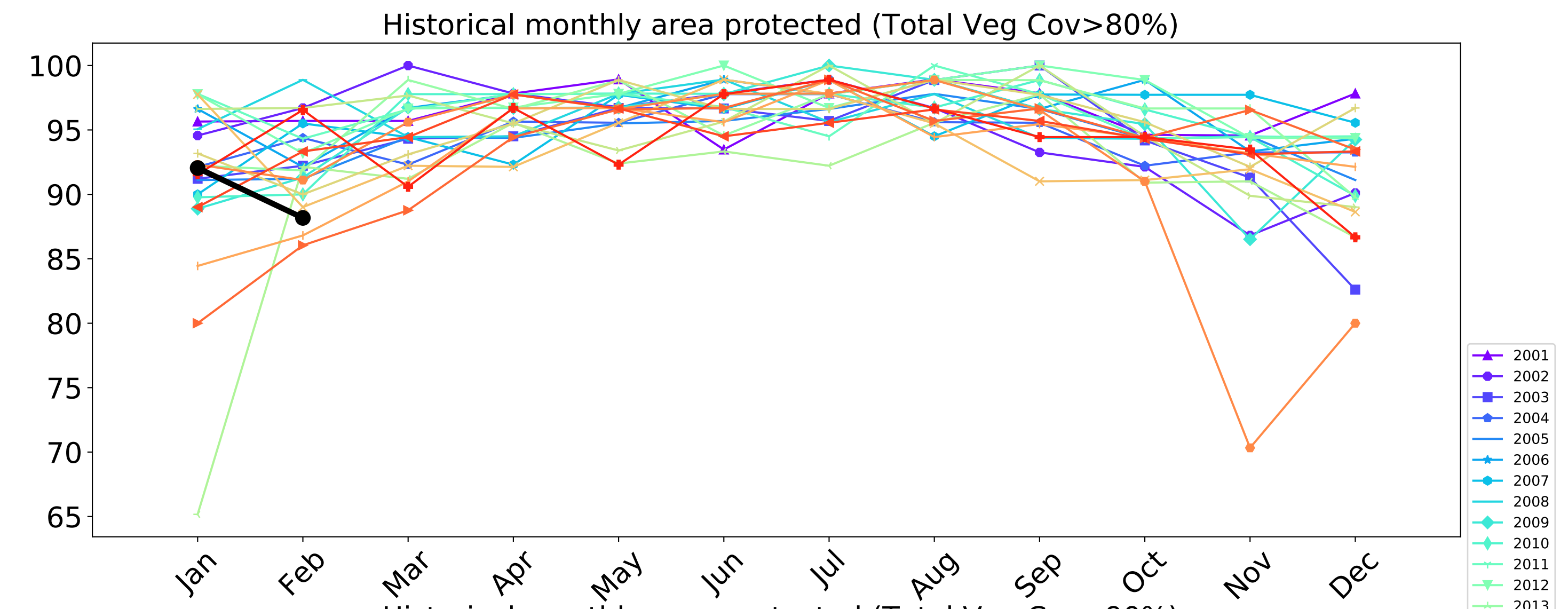
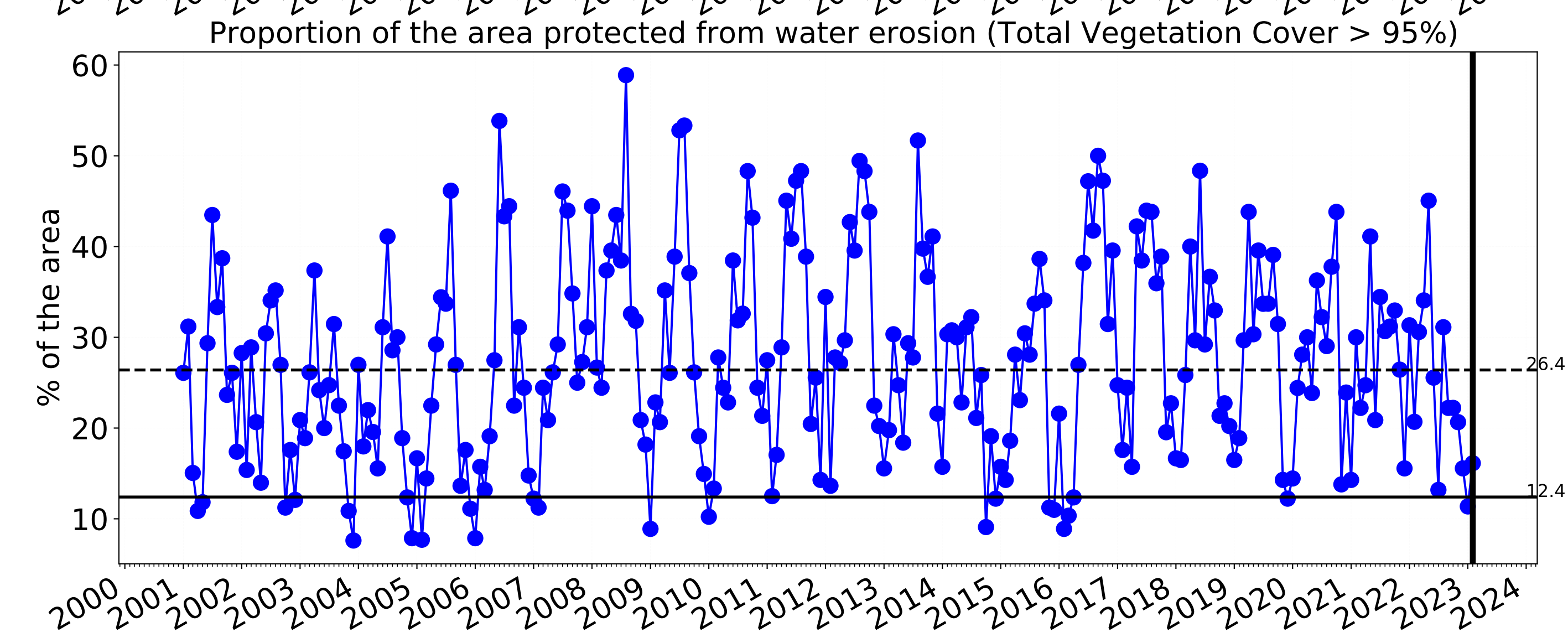
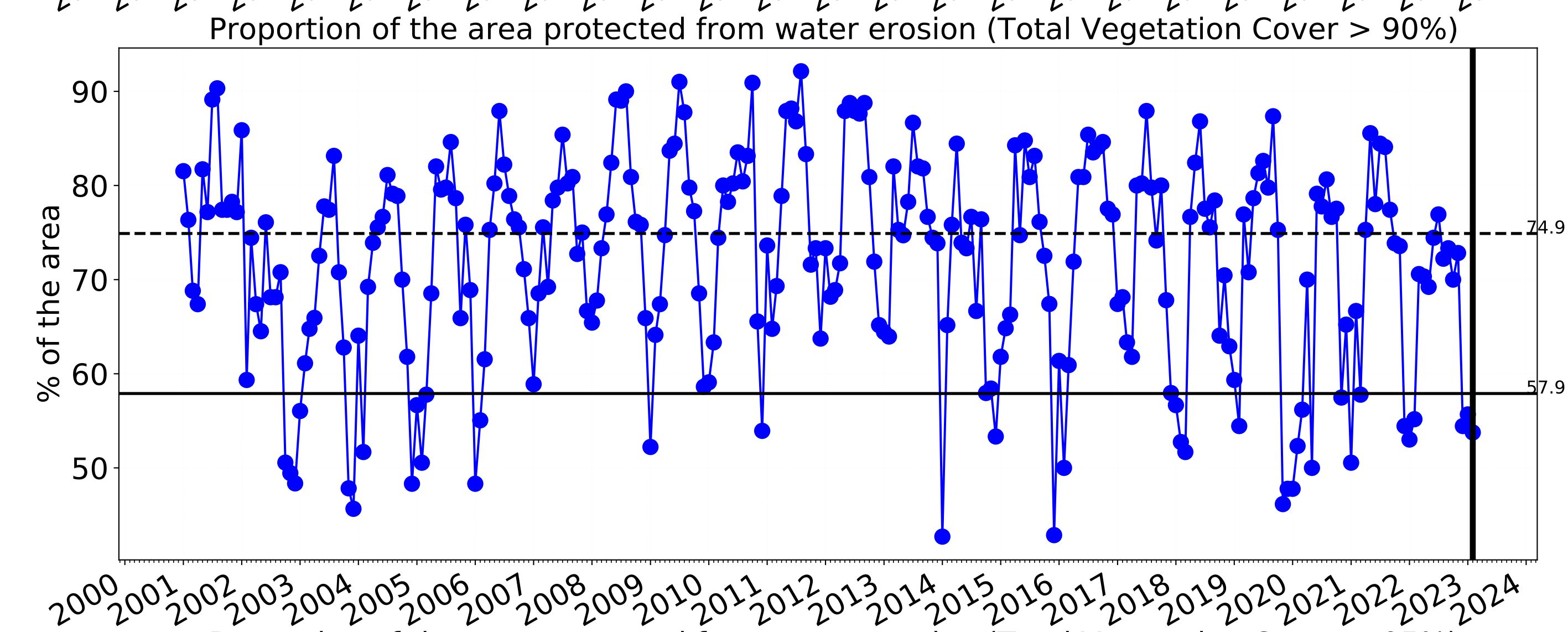
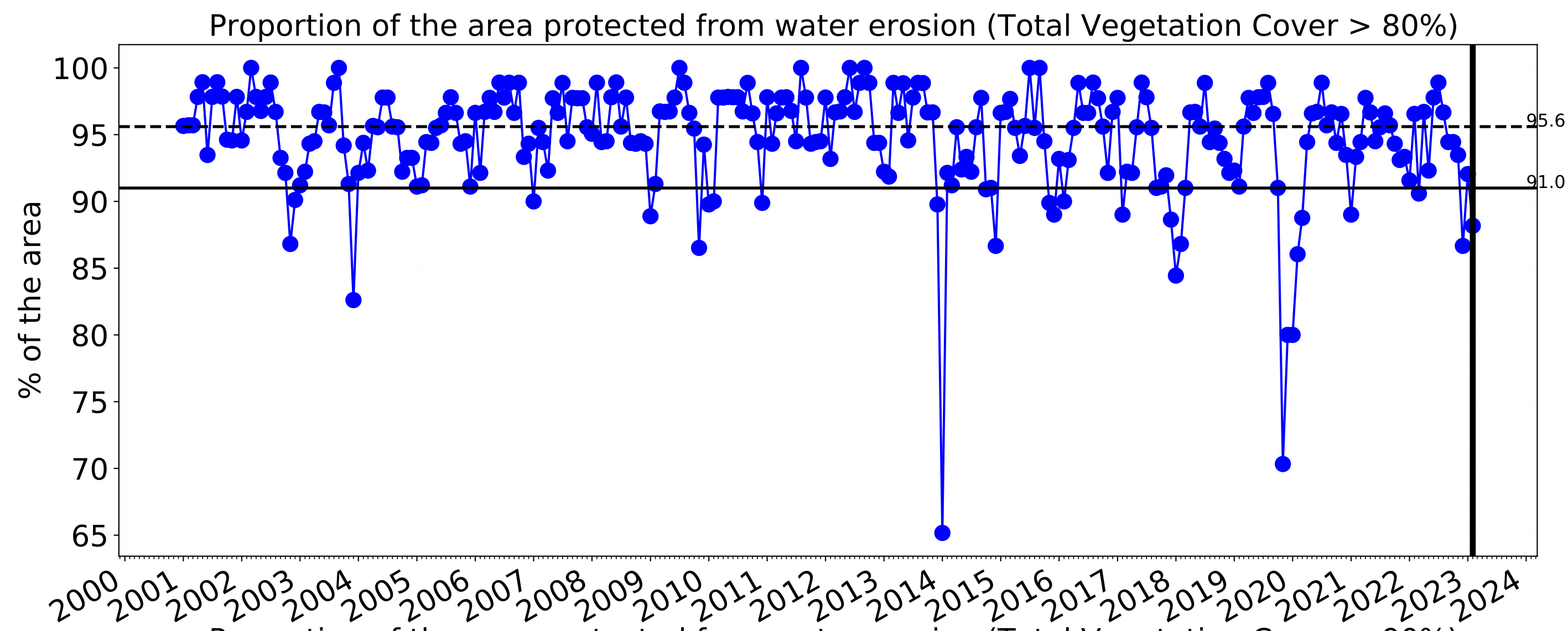


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



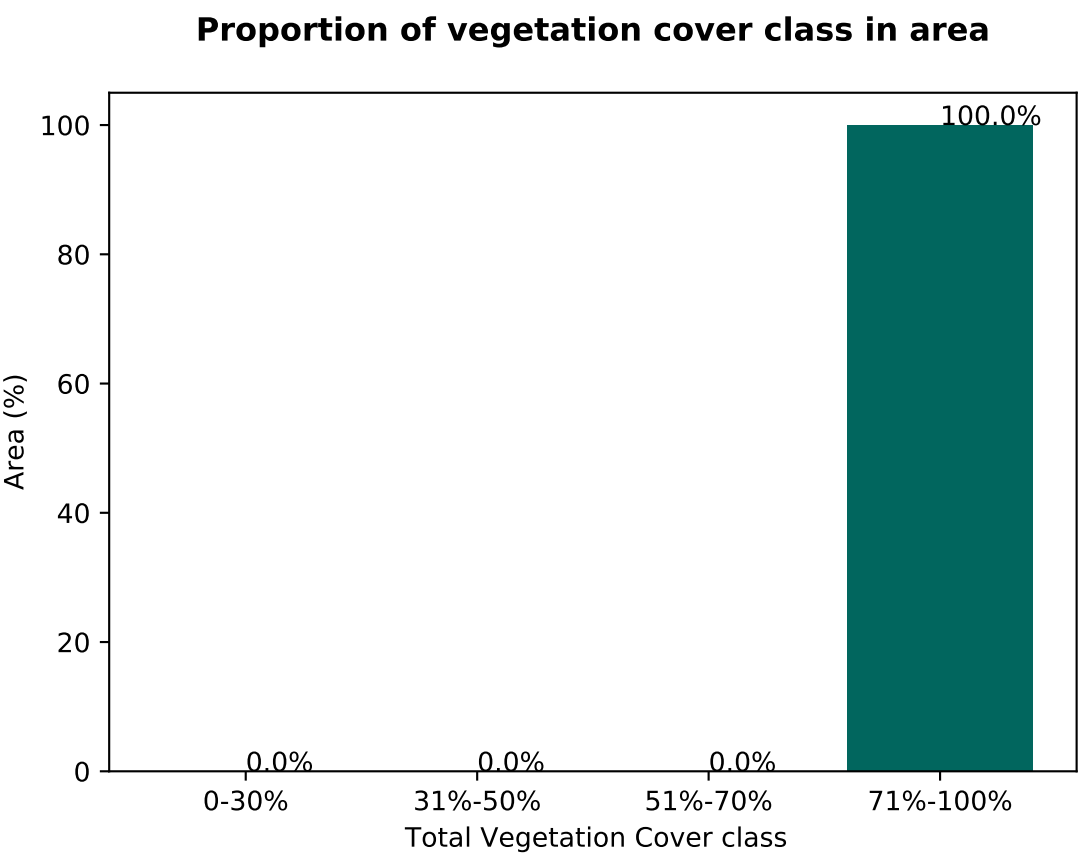
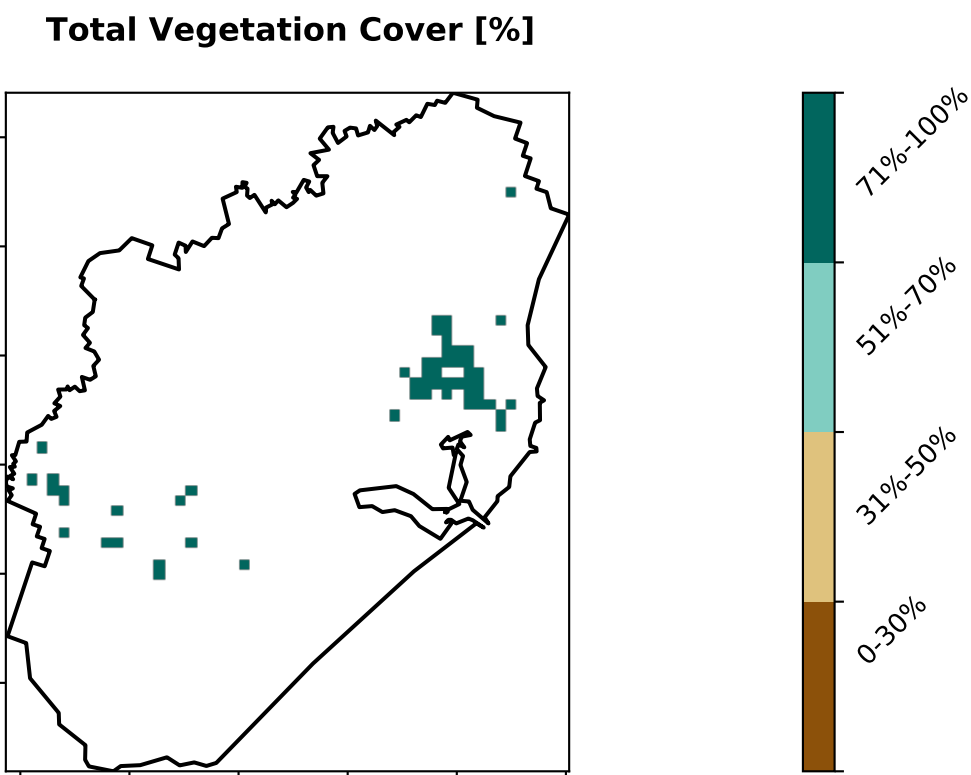
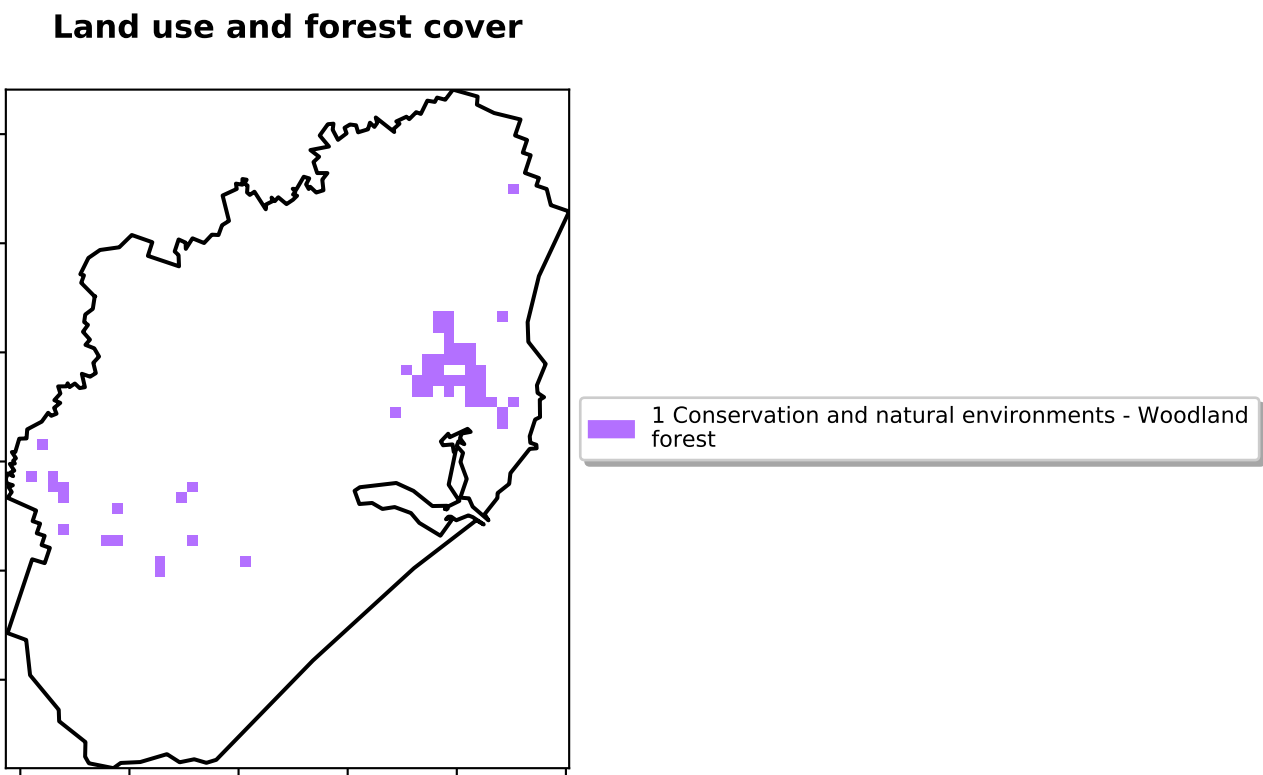
Water erosion historical monthly area protected (Total Veg Cov>70%)



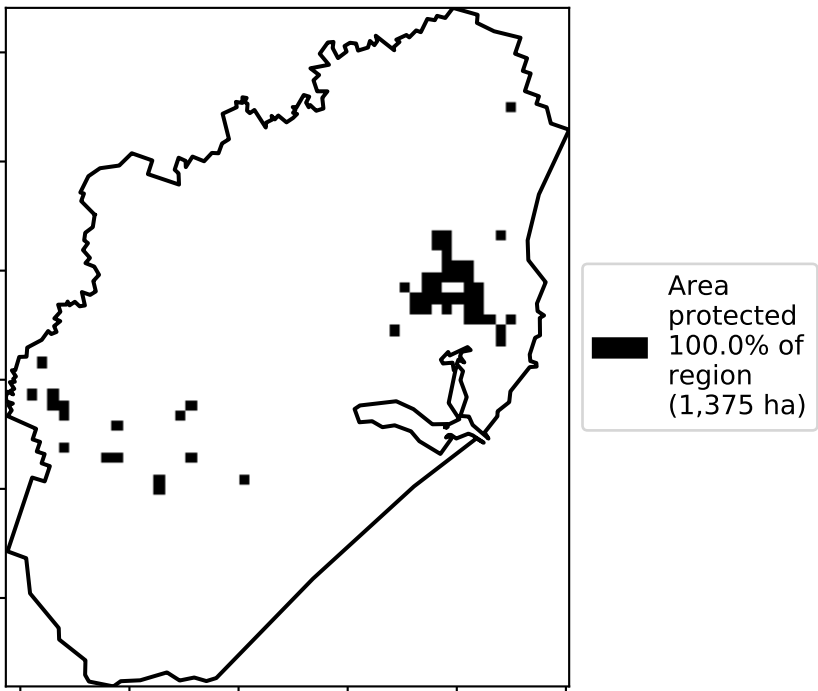


Conservation and natural environments Woodland forest

Catchment Scale
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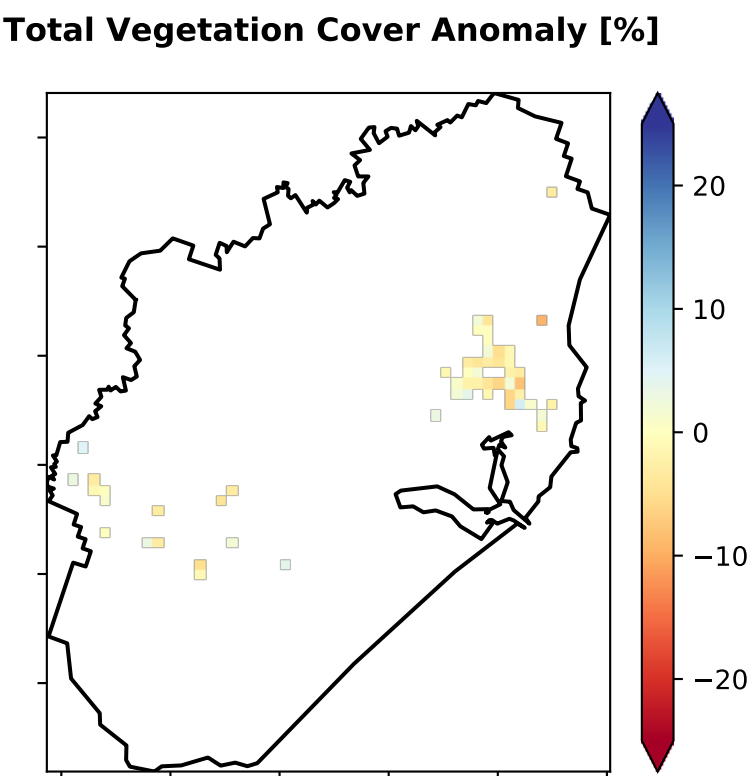
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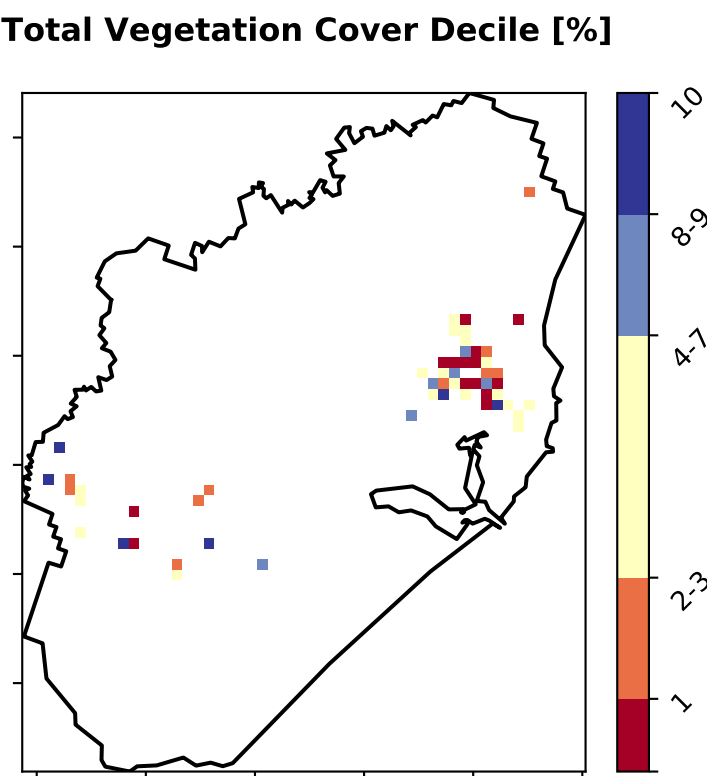
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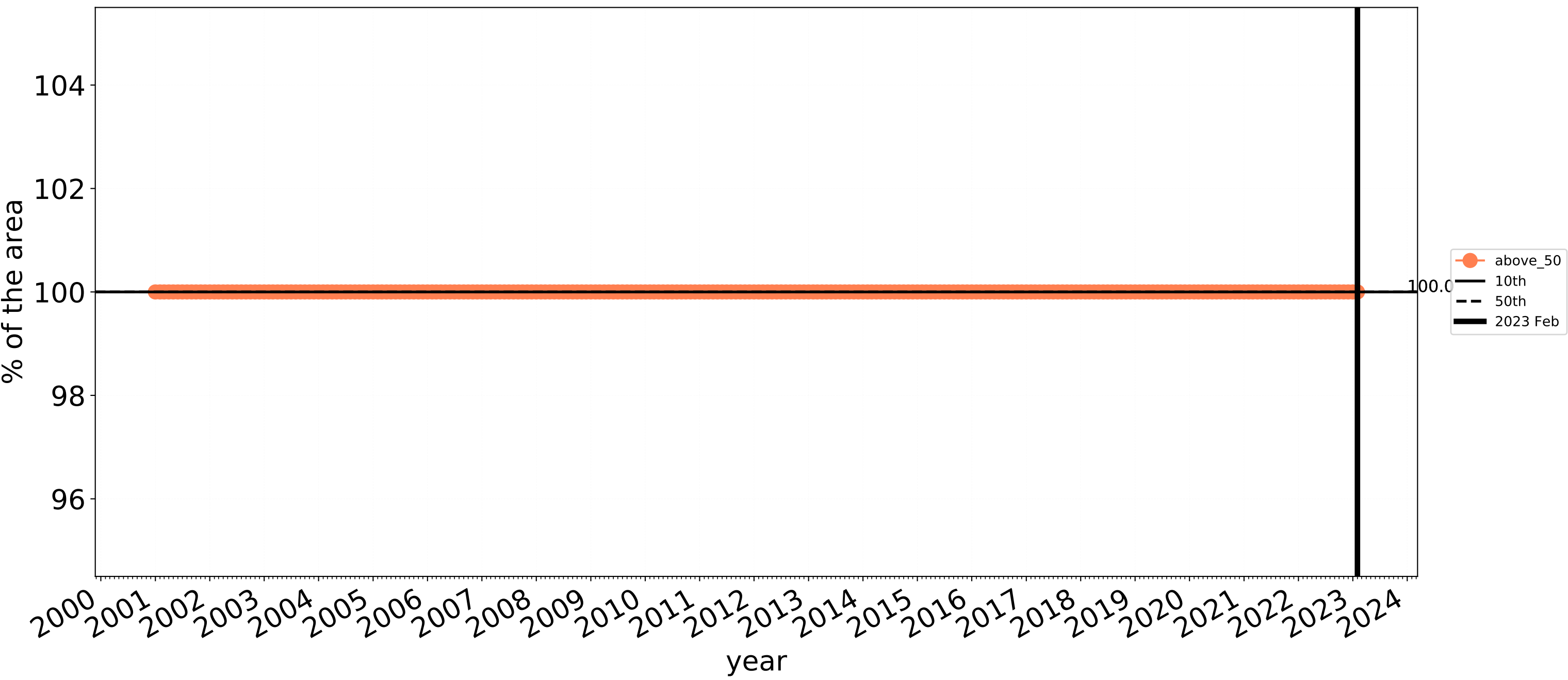
Anomaly show how
many percentage
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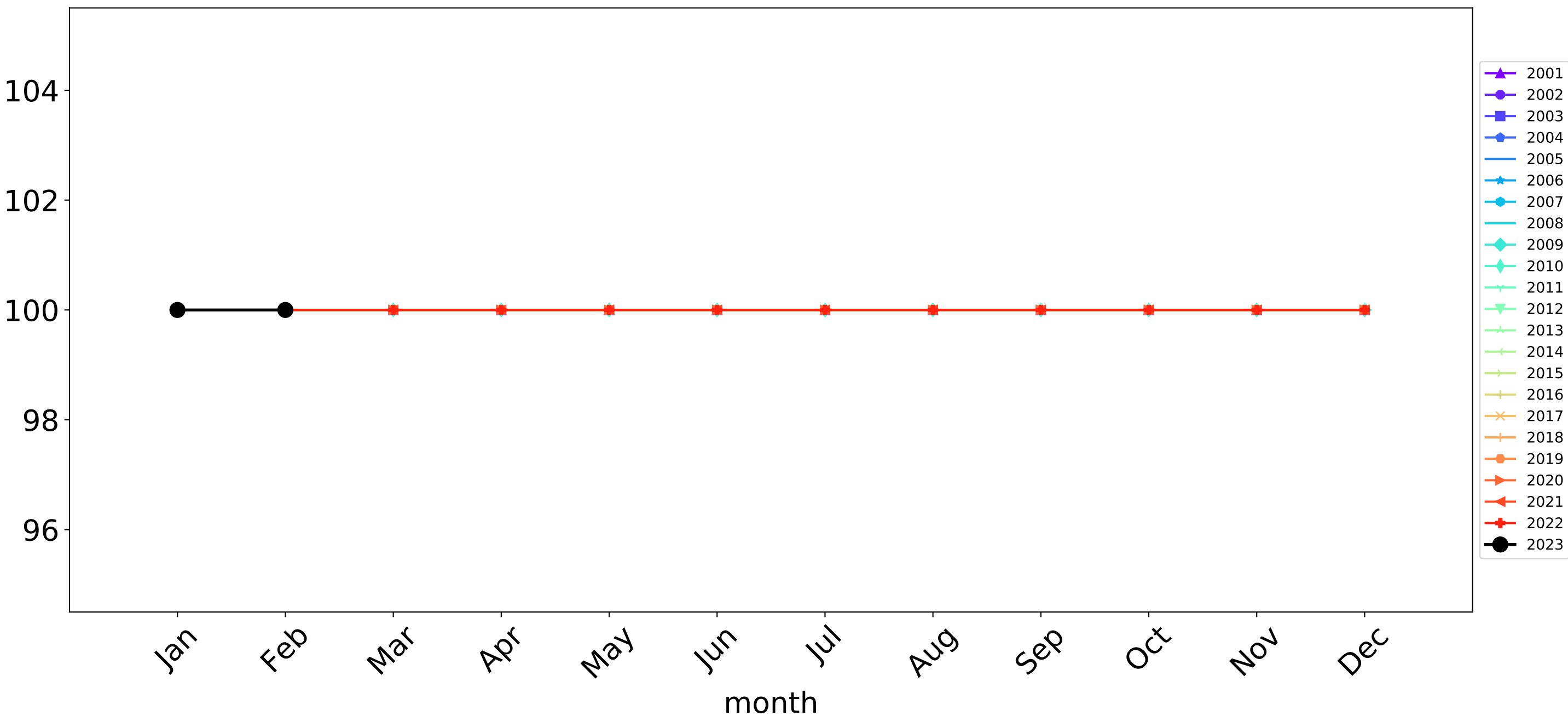
Deciles show where the
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That is, red pixels are
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the map using baseline
from 2001 to 2019.



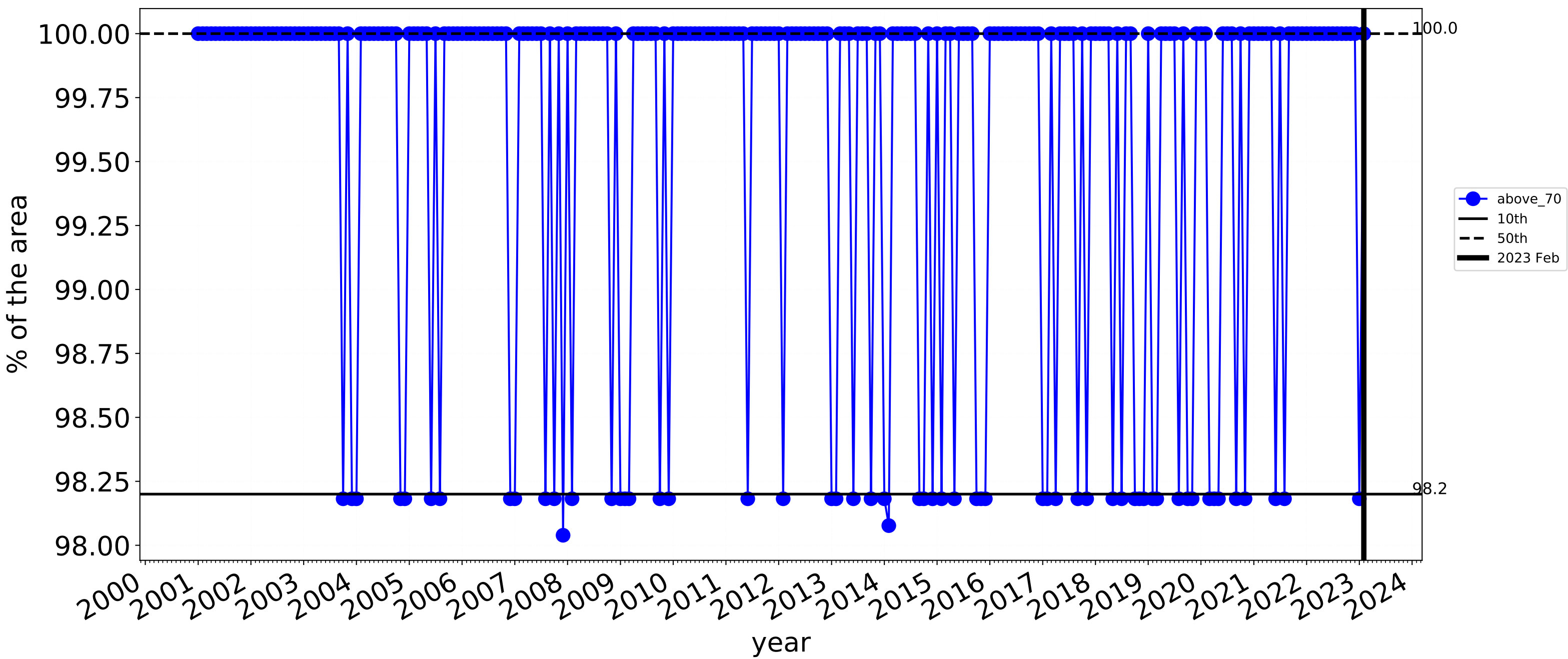
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



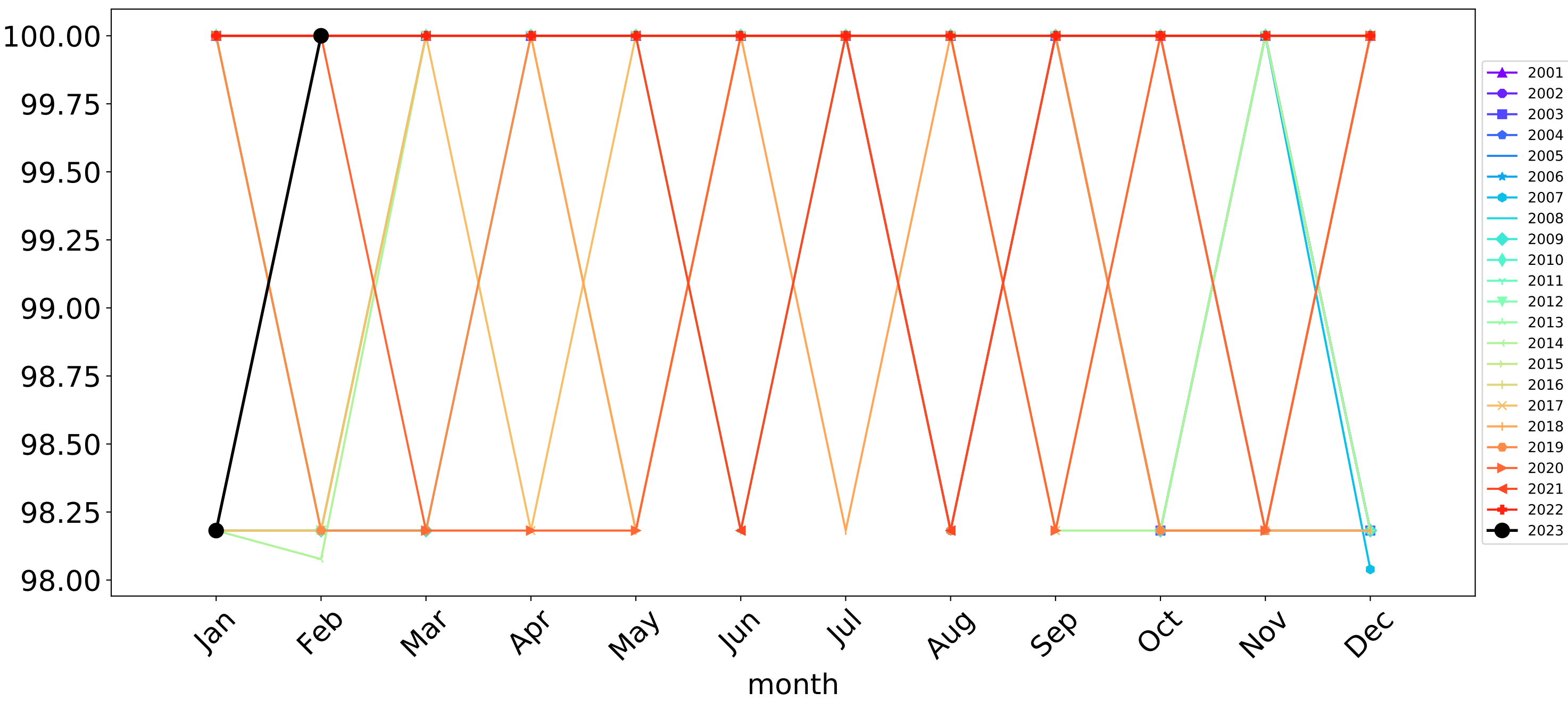
Wind erosion historical monthly area protected (Total Veg Cov >50%)

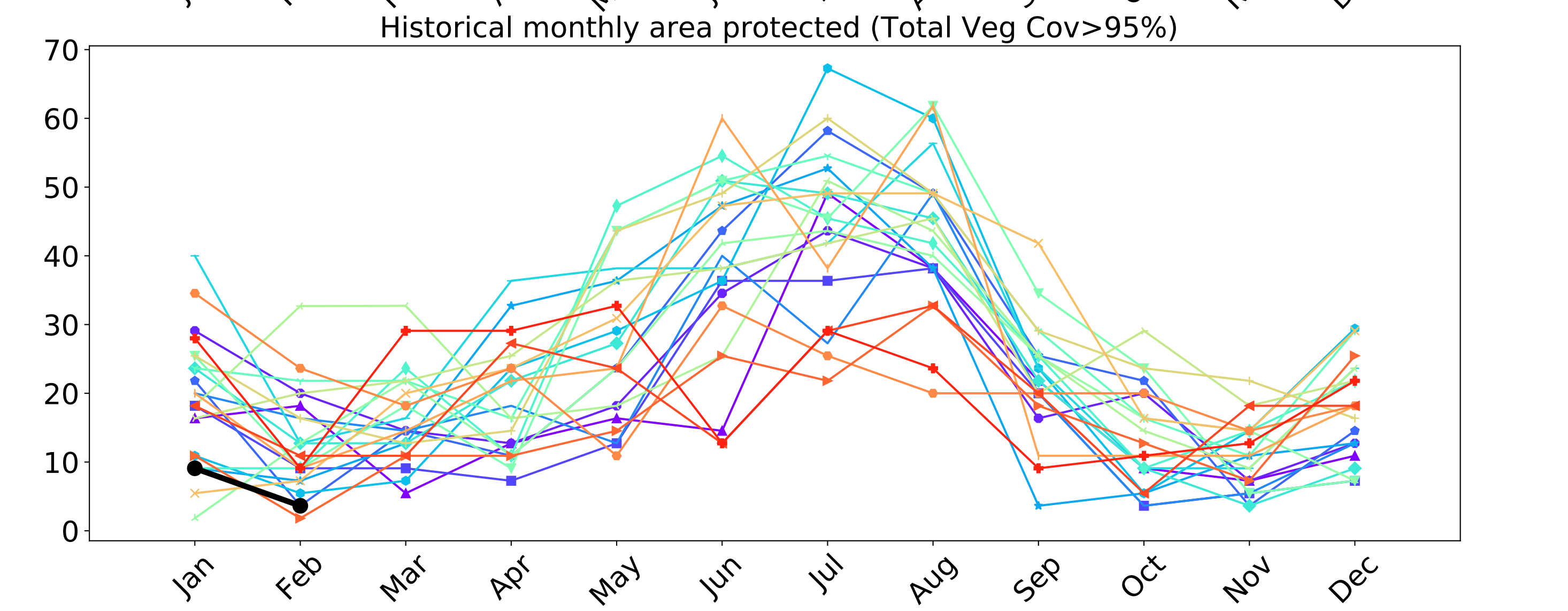
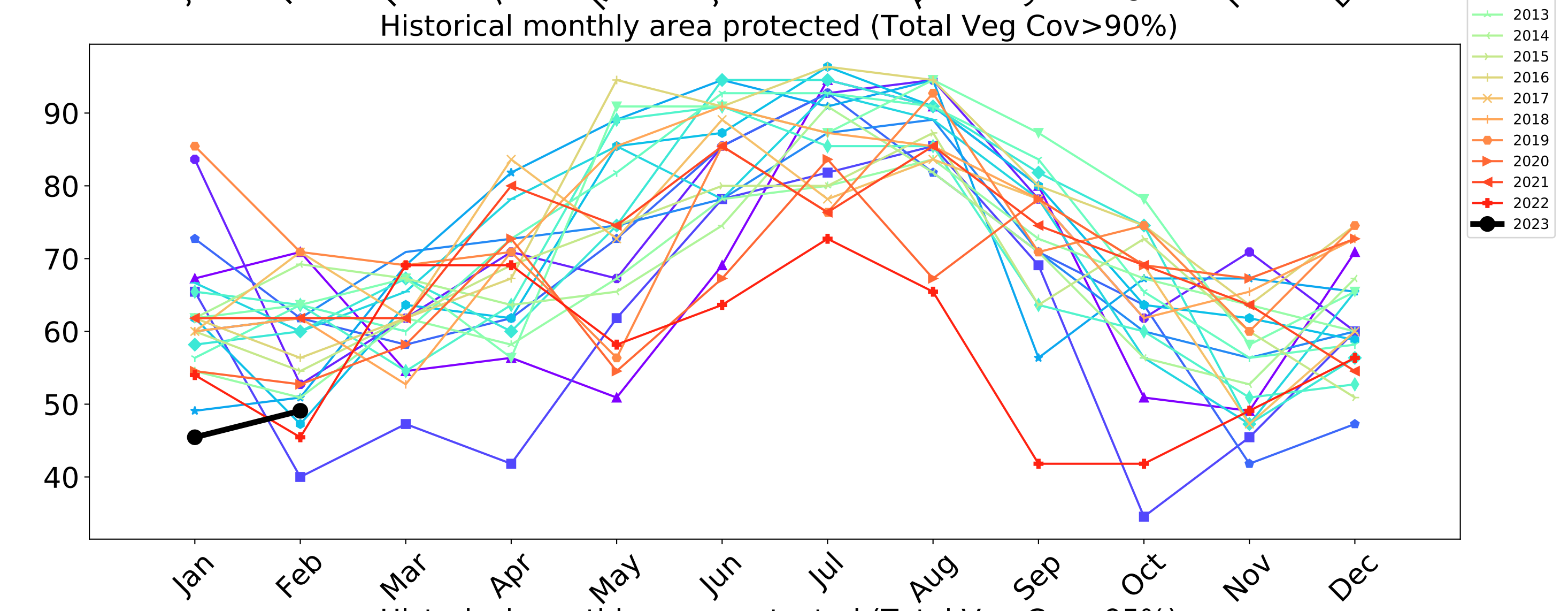
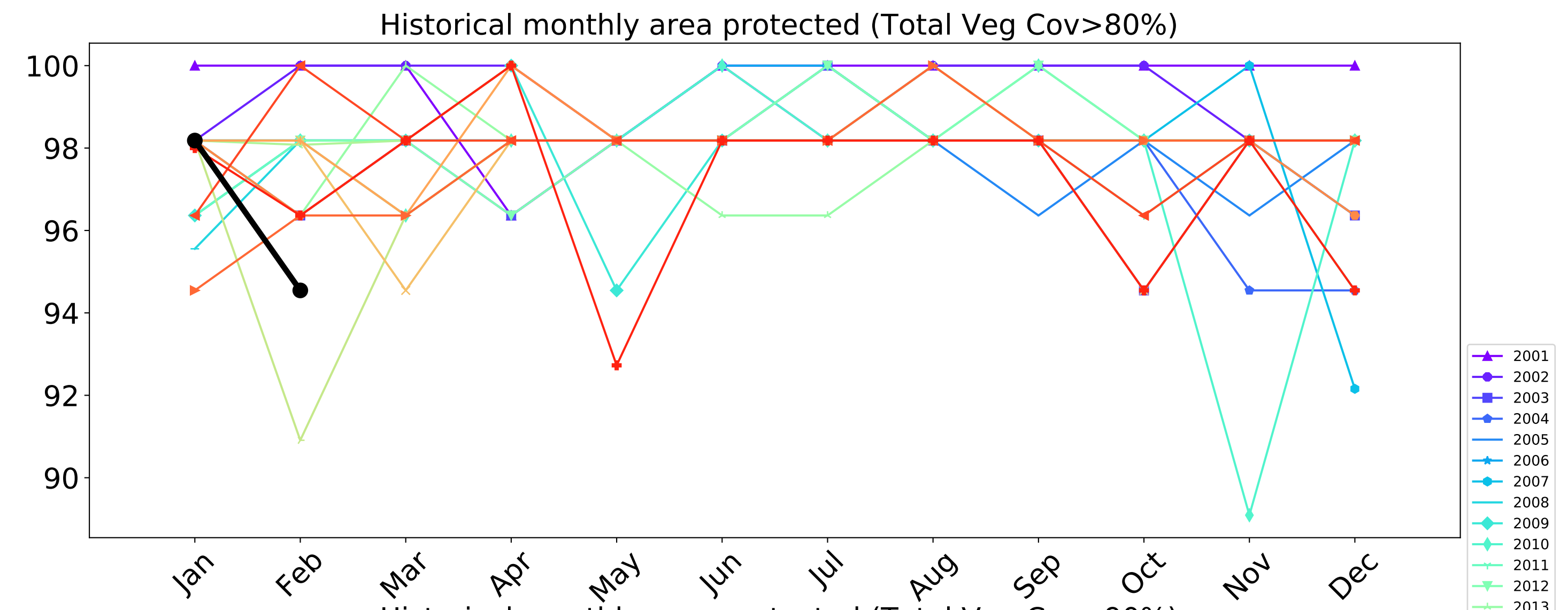
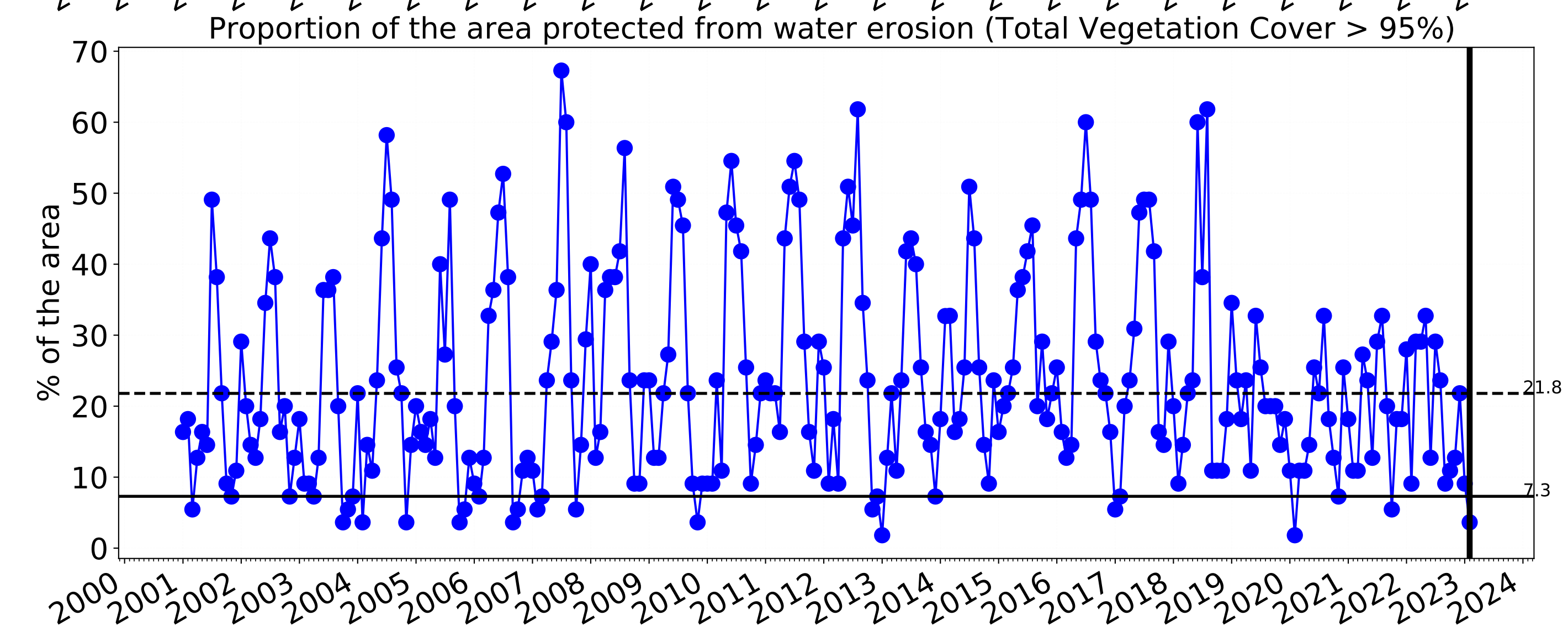
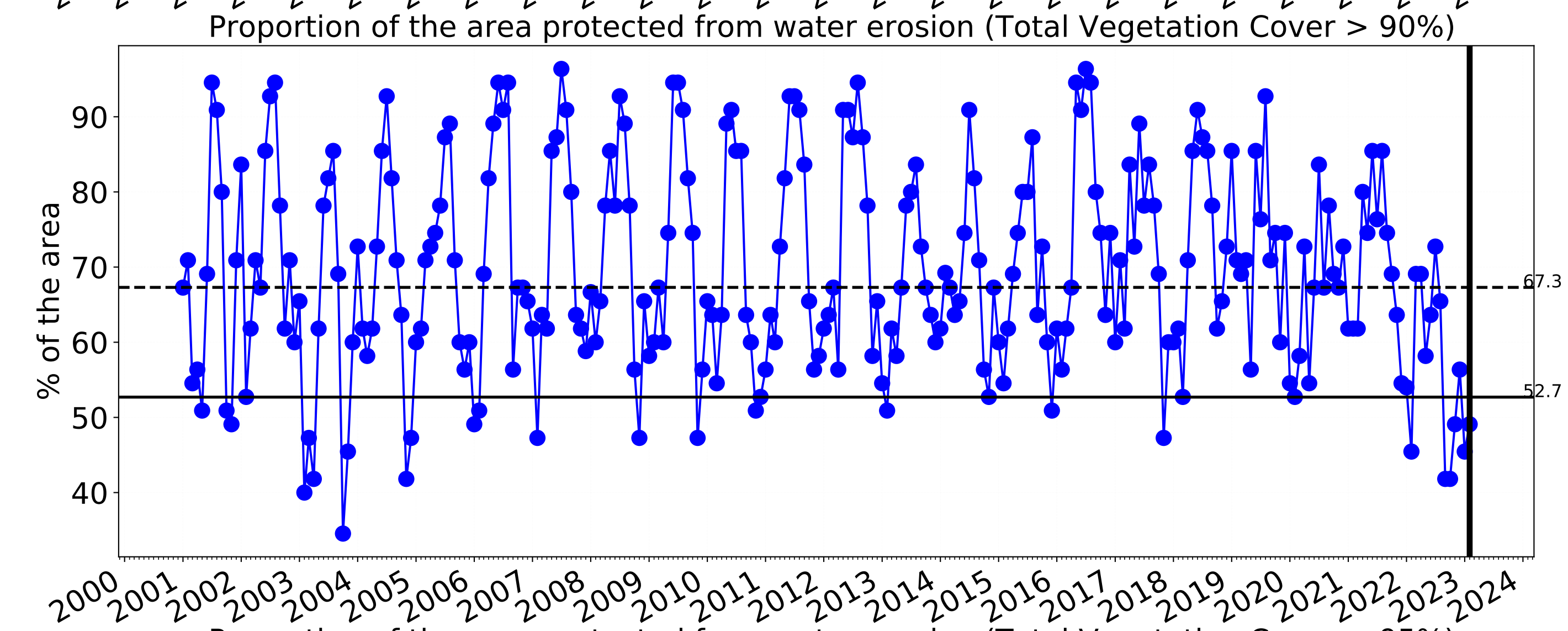
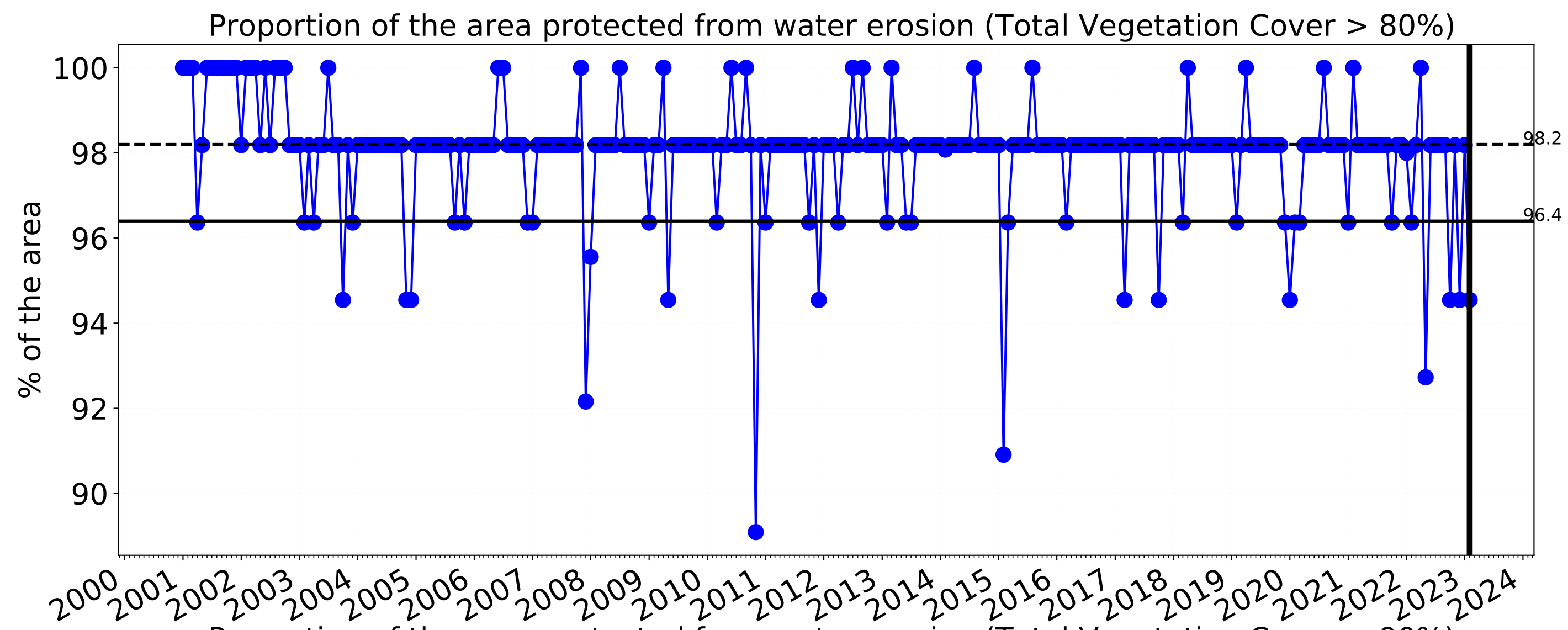


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

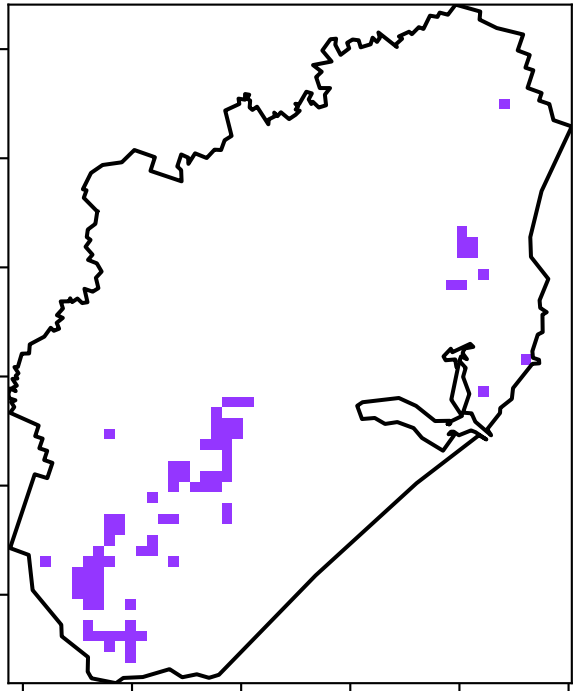




Conservation and natural environments Forest (non woodland)

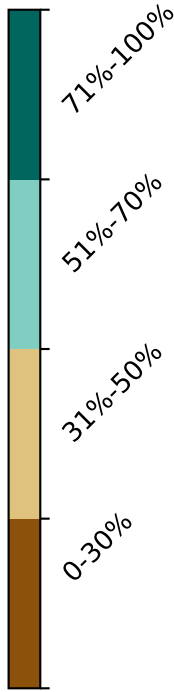
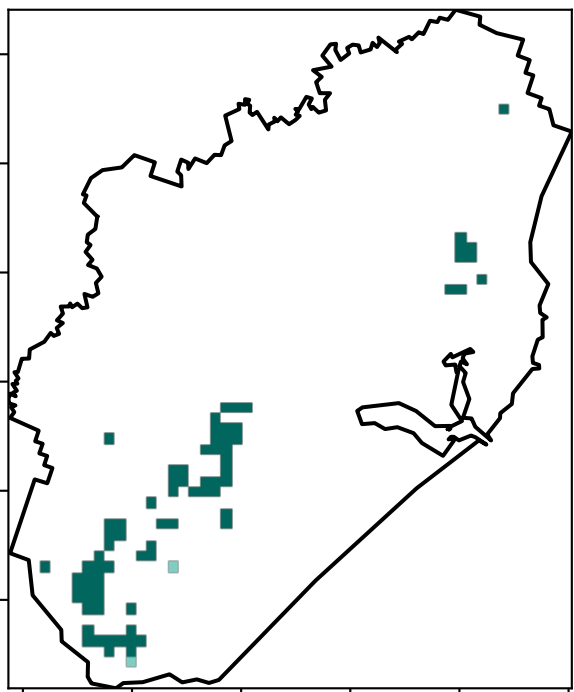
Land use and forest cover

Catchment Scale
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(2018) and Forests
of Australia (2018)

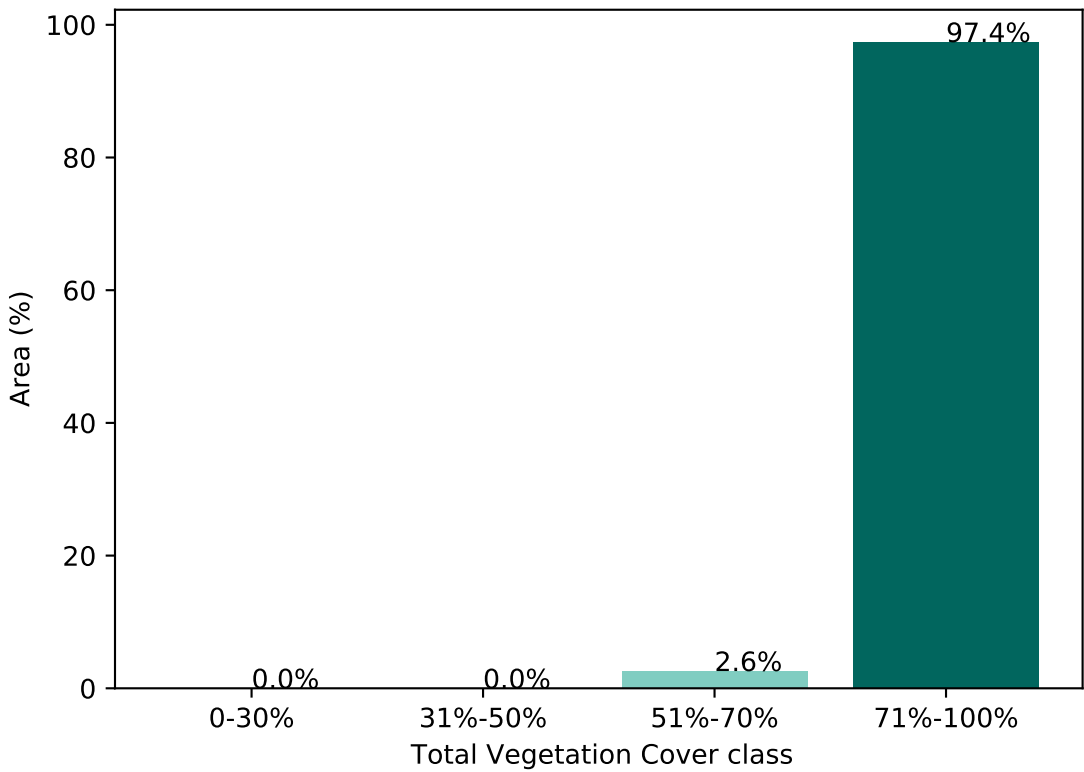


1 Conservation and natural environments - Non-woodland forest

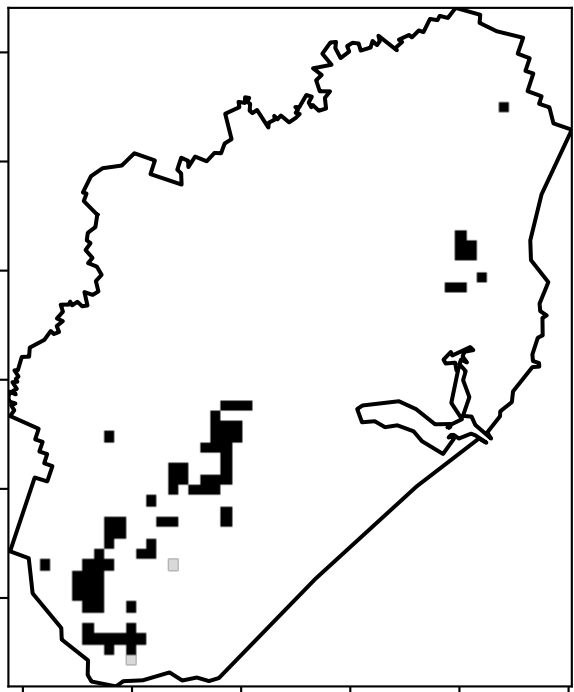
Total Vegetation Cover [%]



Proportion of vegetation cover class in area

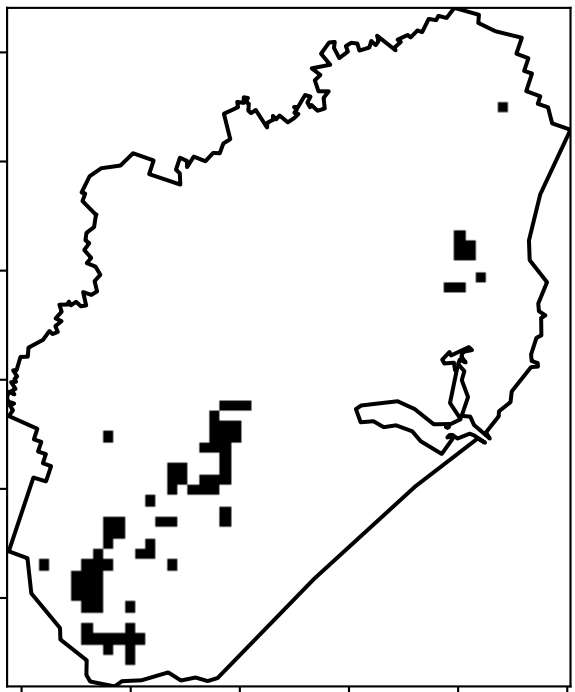


% Area protected from water erosion (>70%)



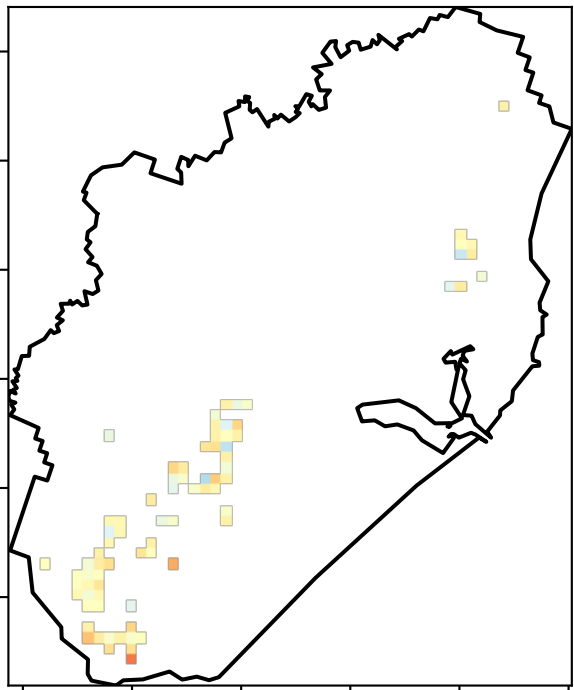
Area not protected
2.6% of region (51 ha)
Area protected
97.4% of region (1,899 ha)

% Area protected from wind erosion (>50%)

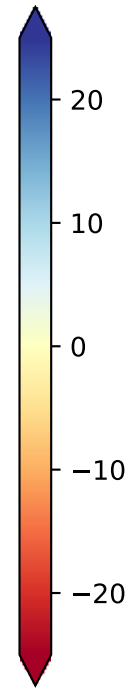


Area protected
100.0% of region (1,950 ha)

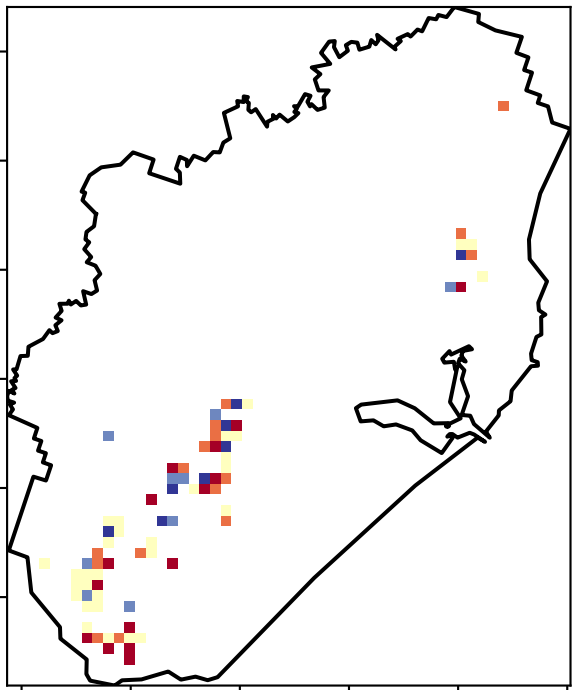
Total Vegetation Cover Anomaly [%]



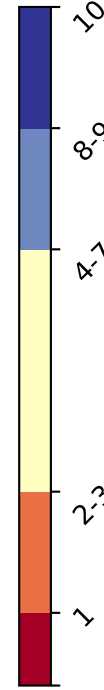
Anomaly show how many percentage points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



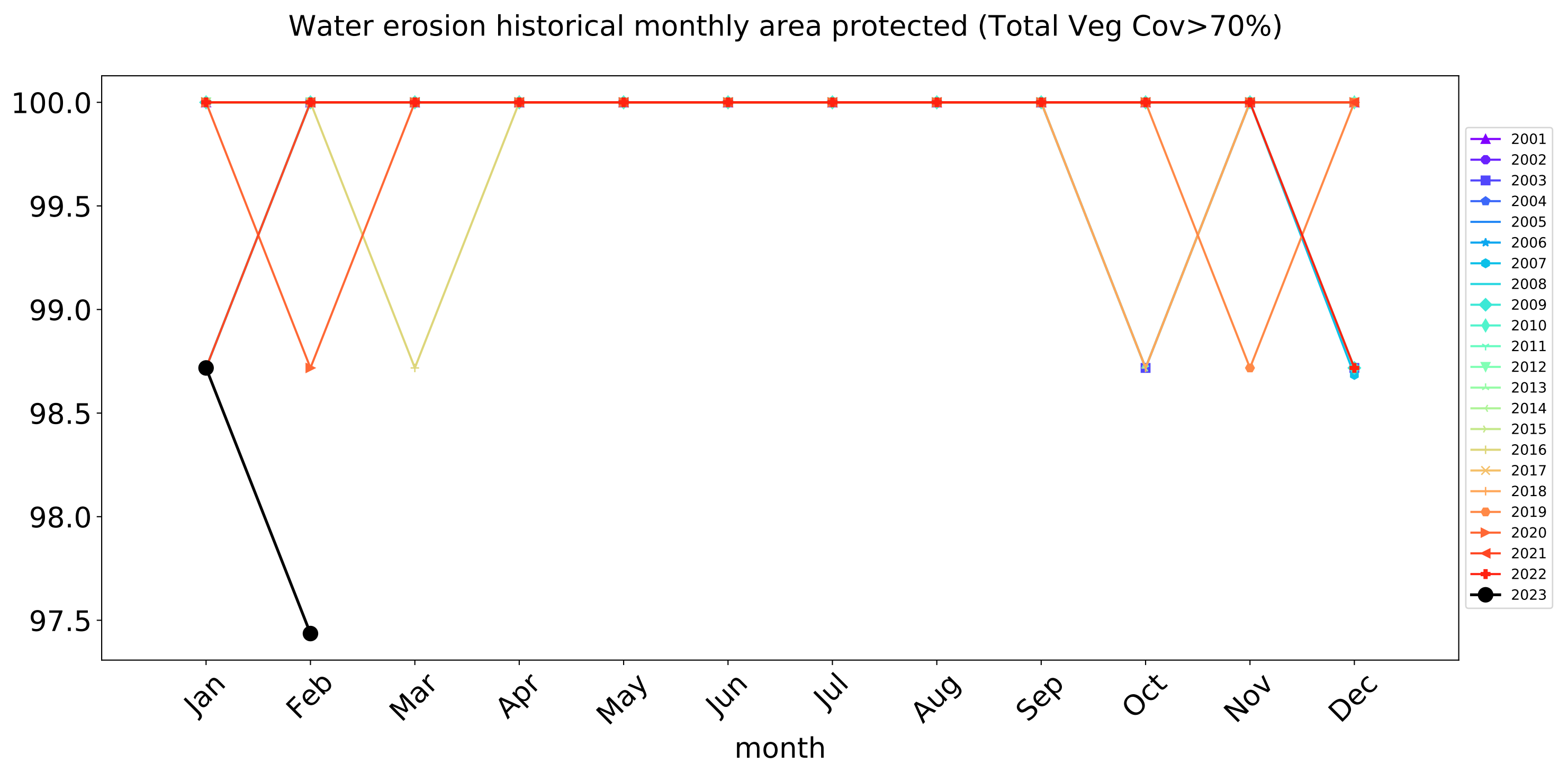
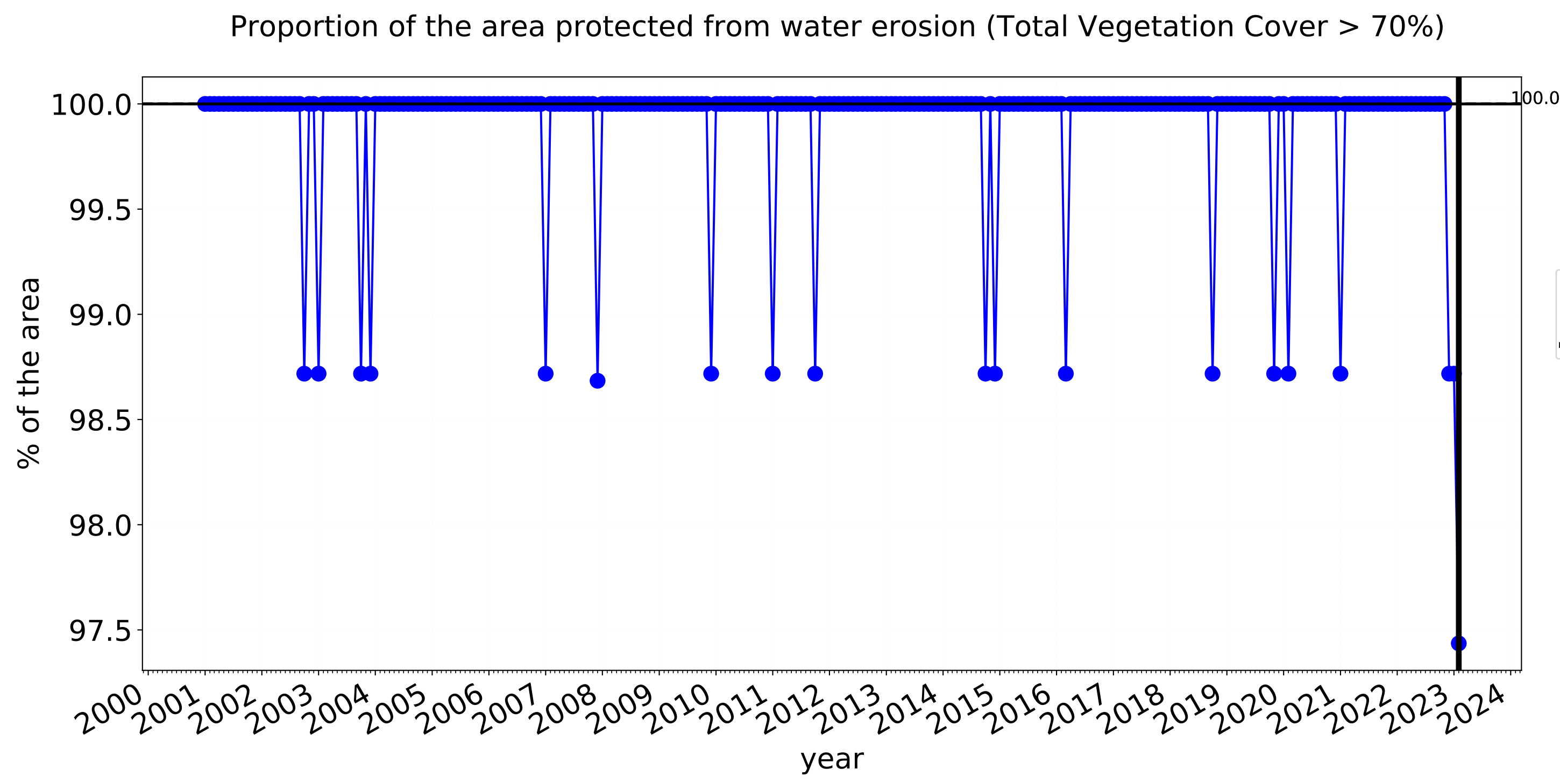
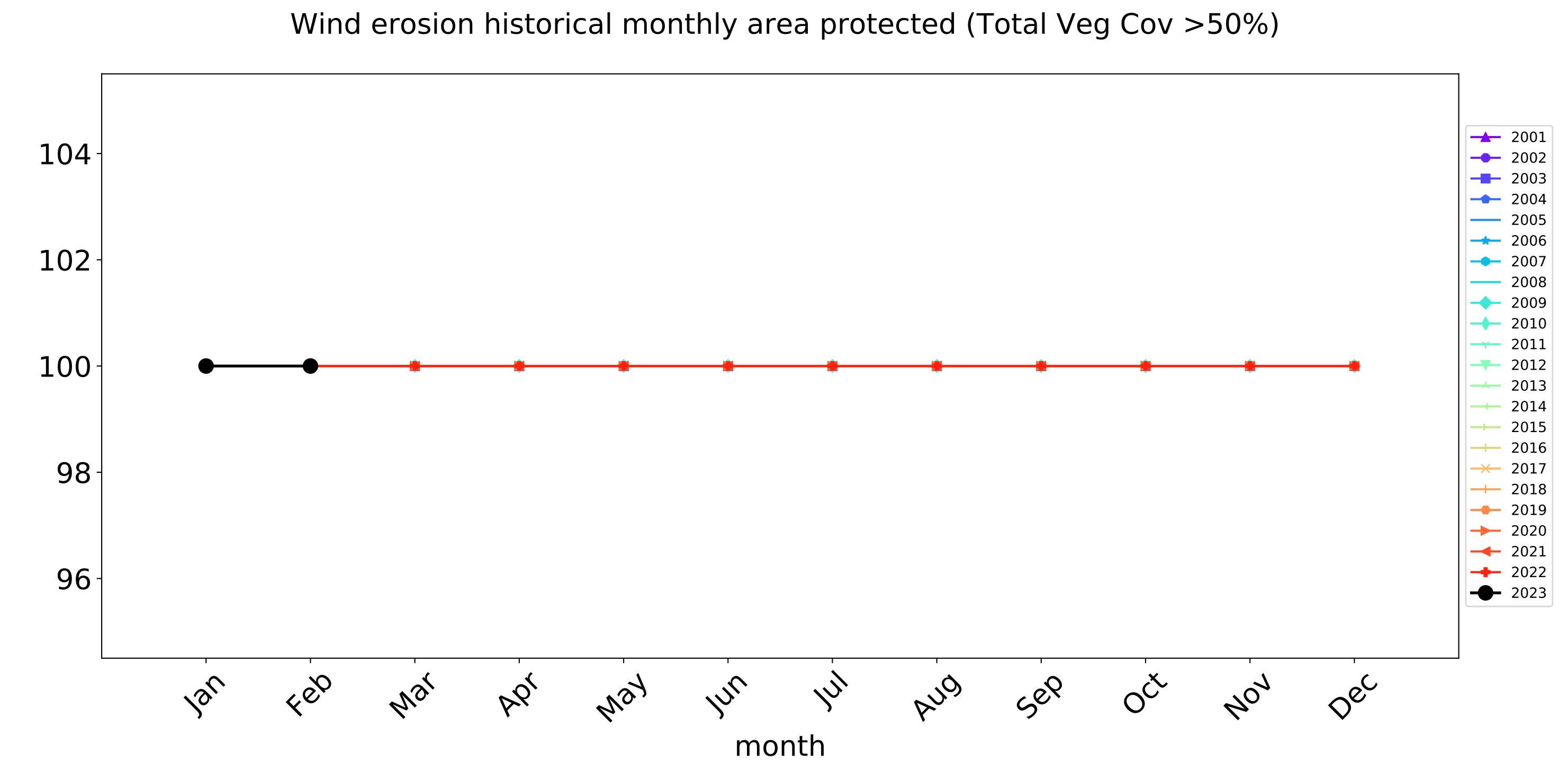
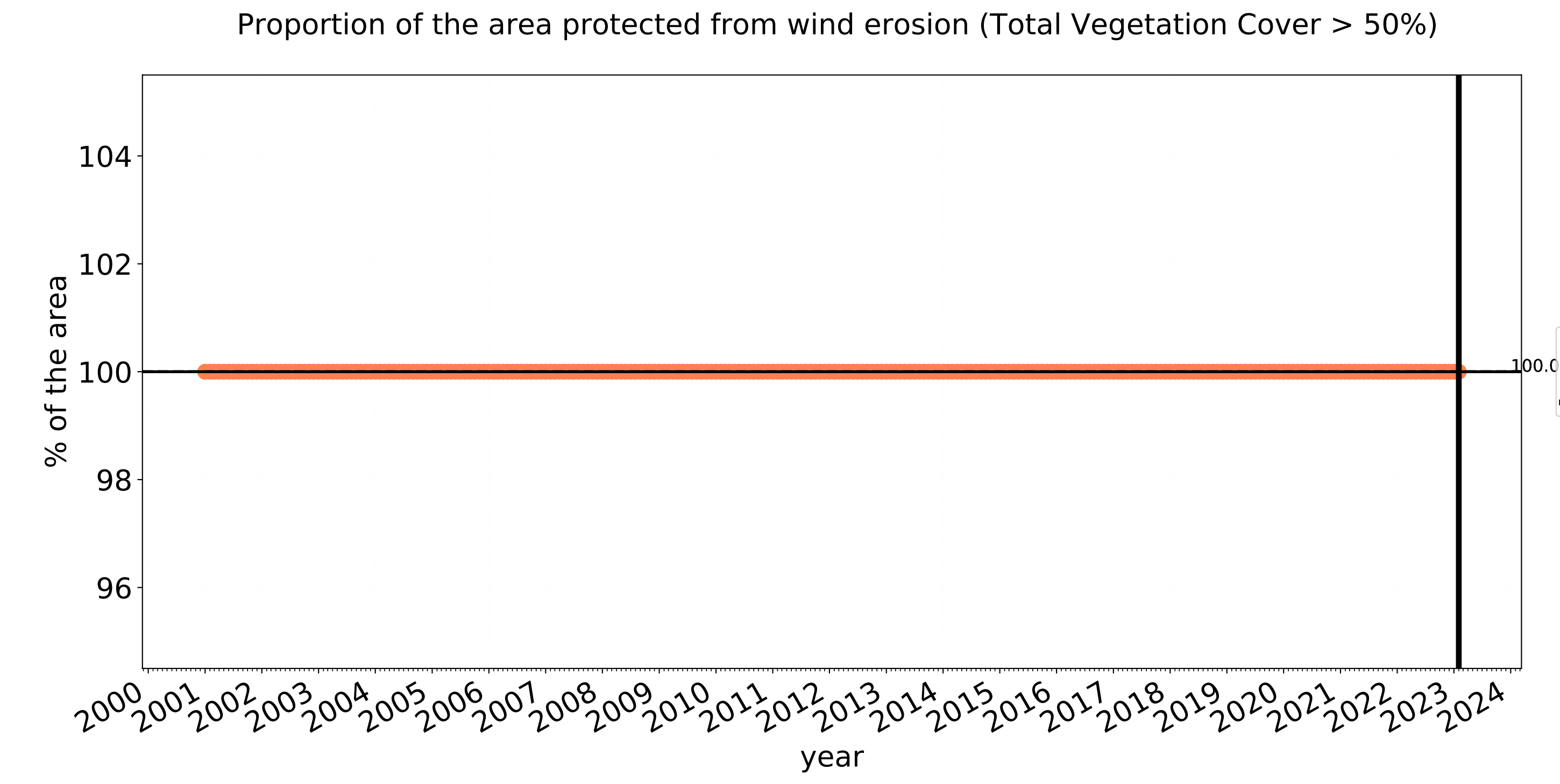
Total Vegetation Cover Decile [%]

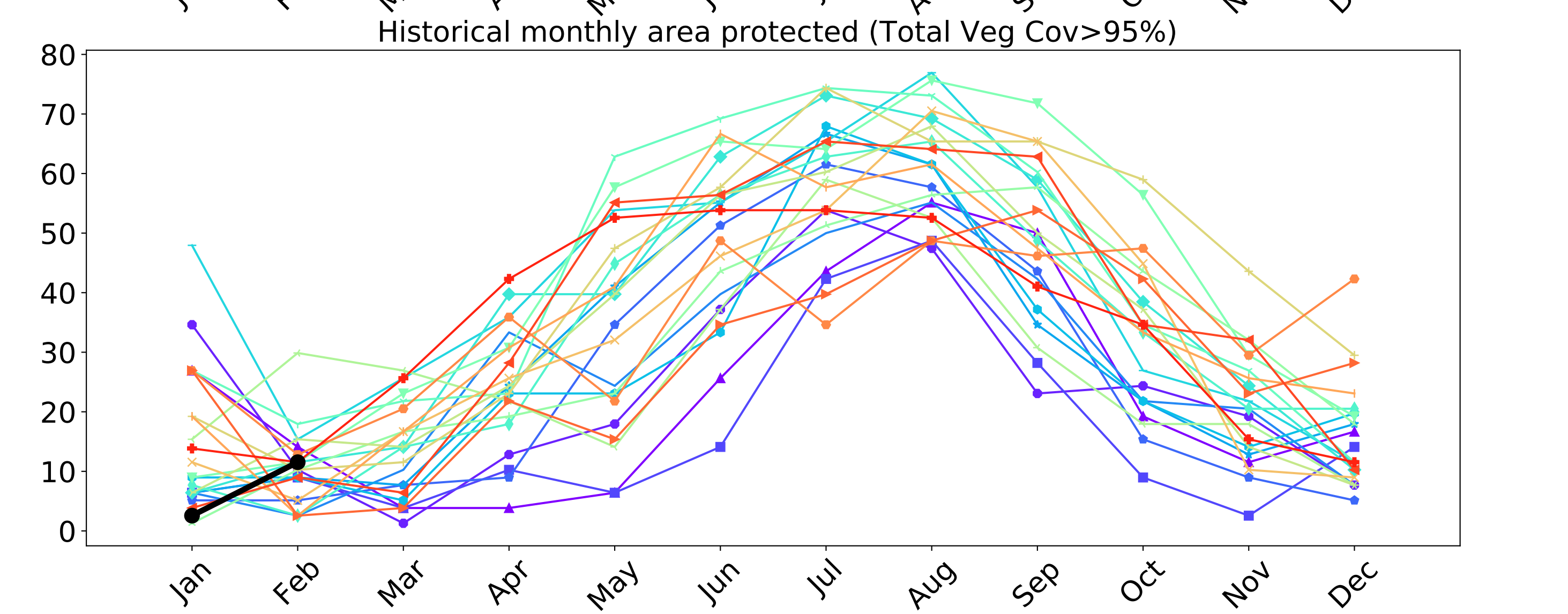
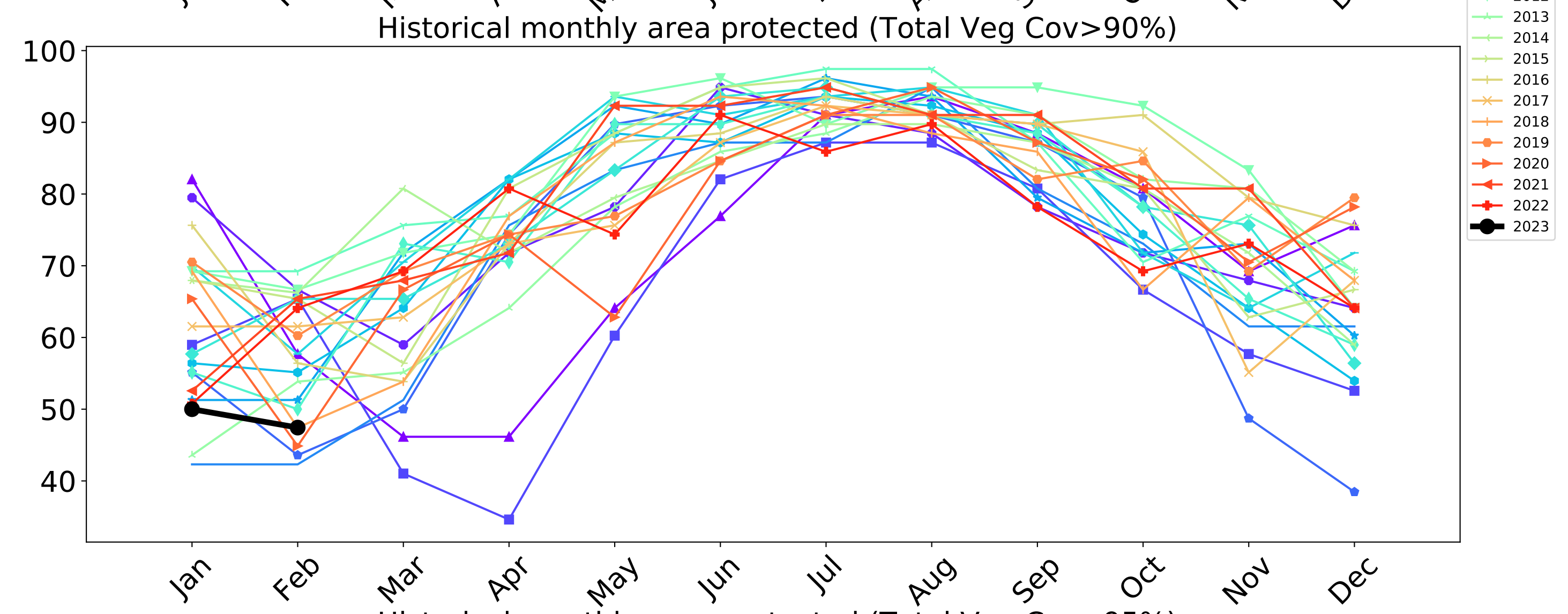
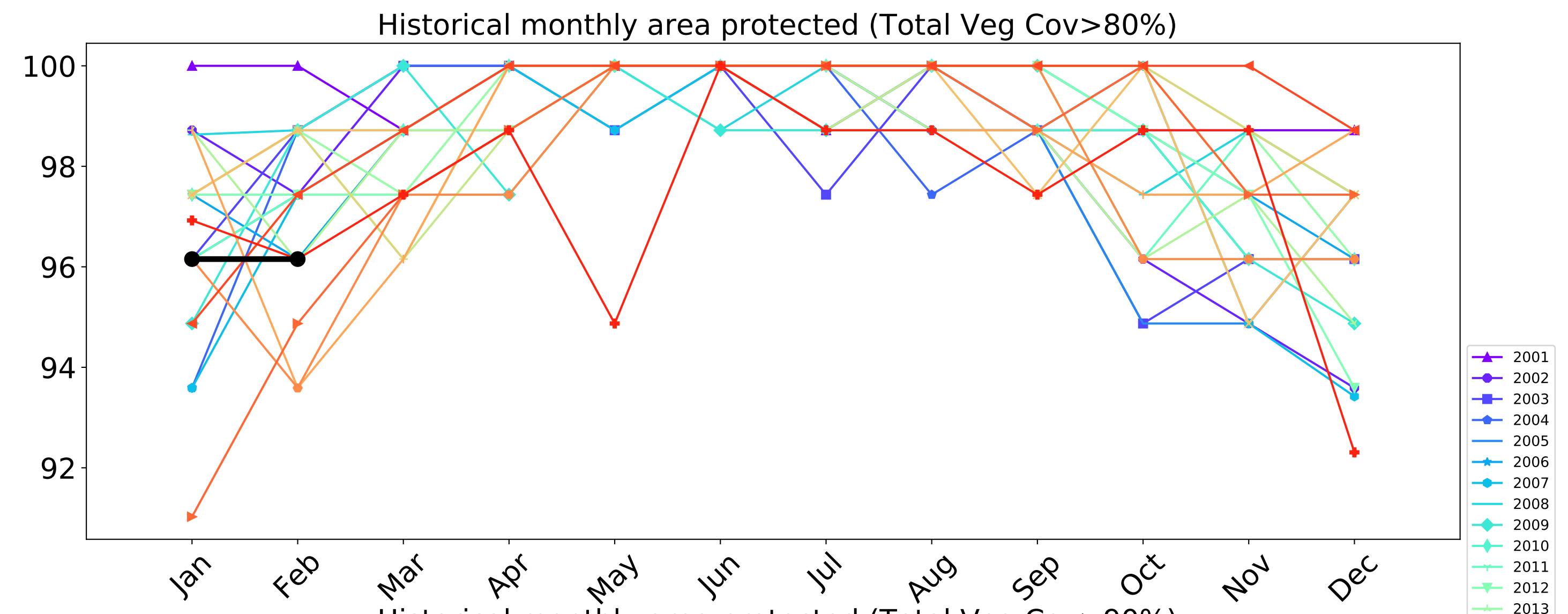
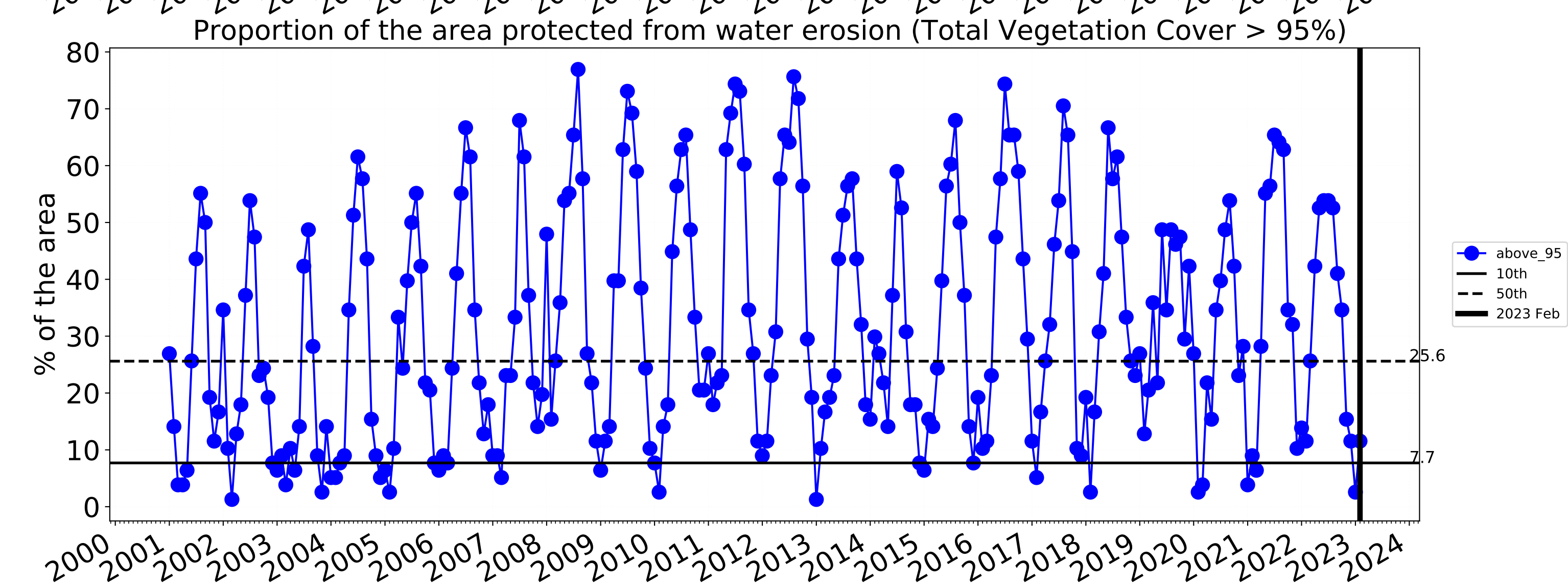
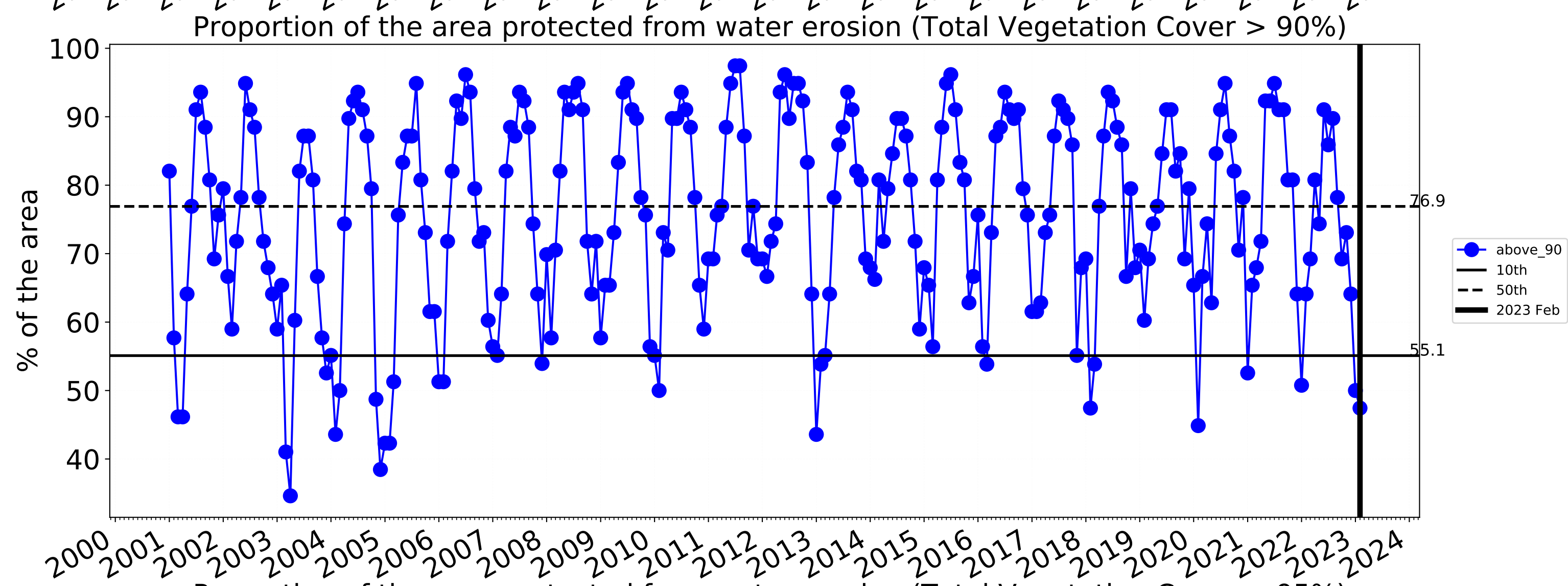
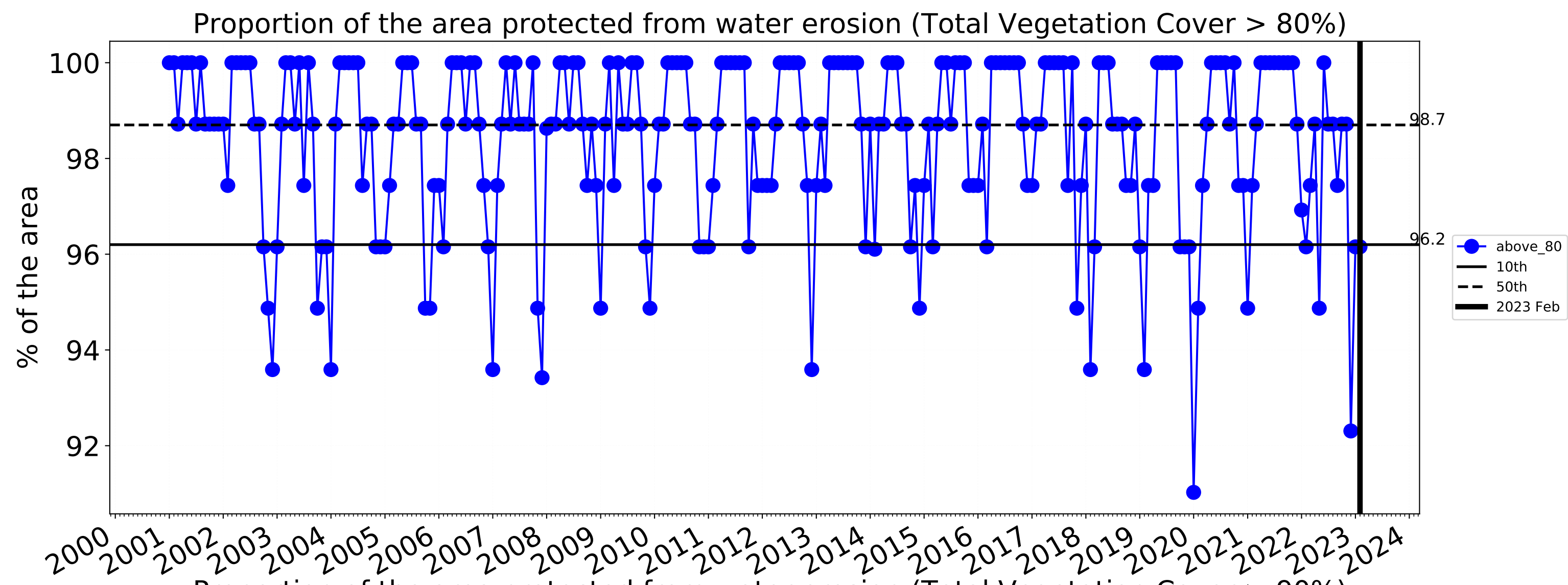


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.



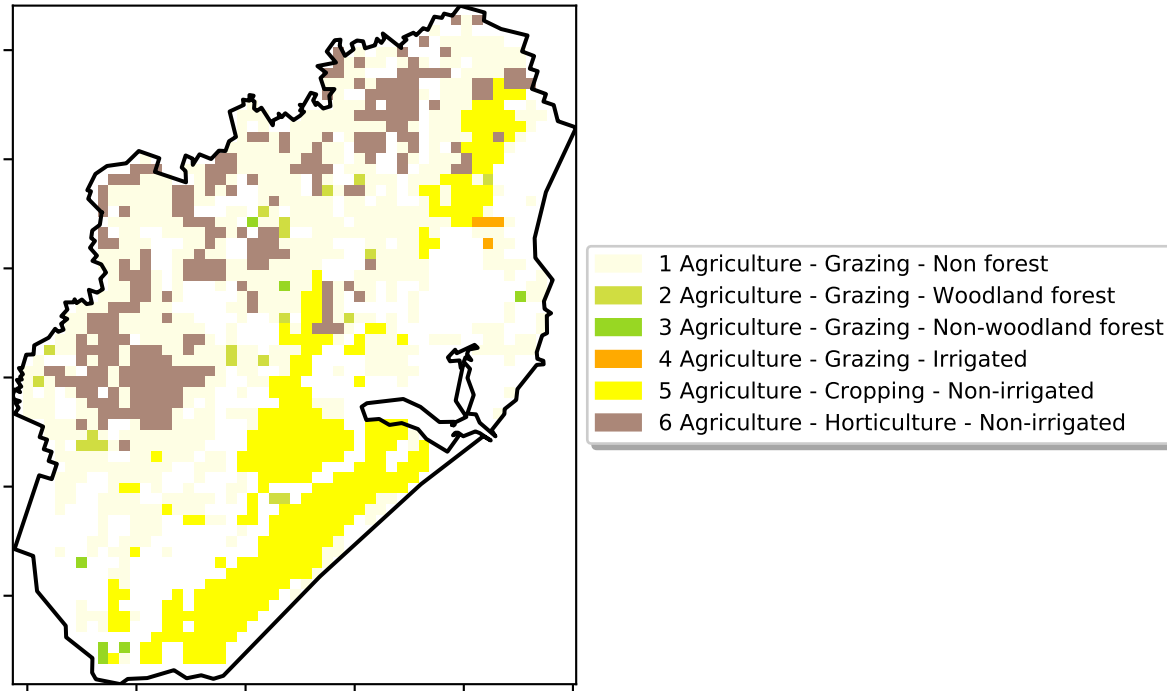
Conservation and natural environments Forest (non woodland) timeseries



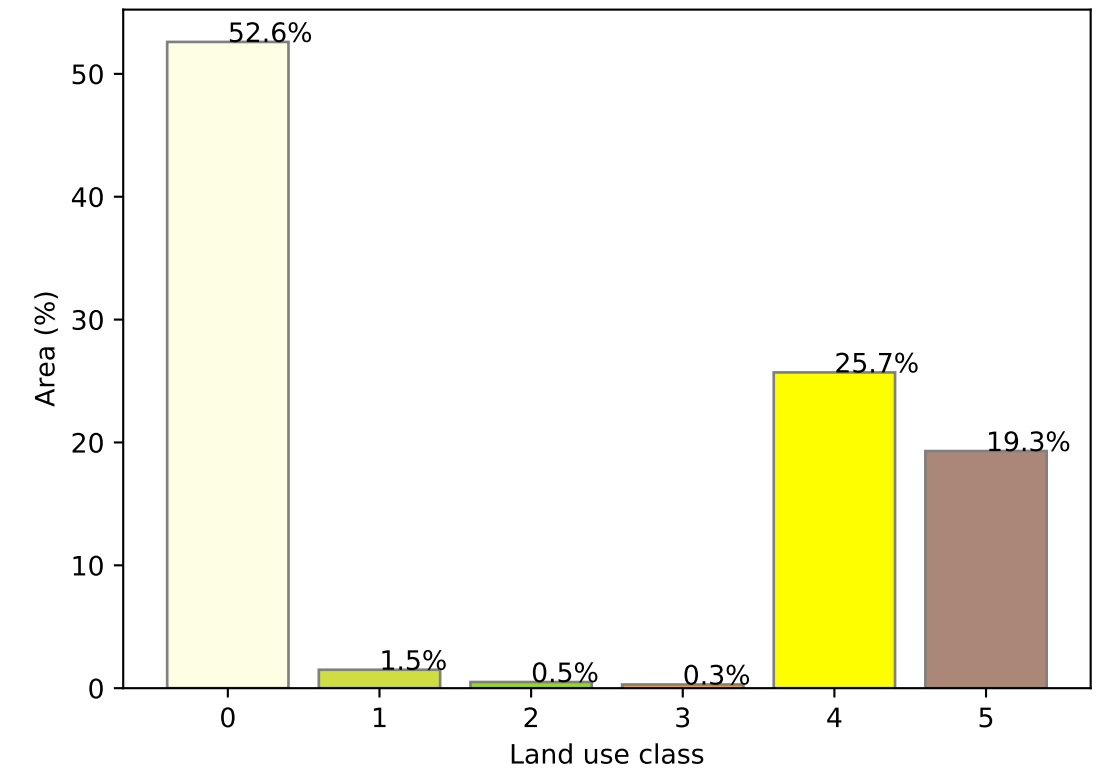


Agriculture

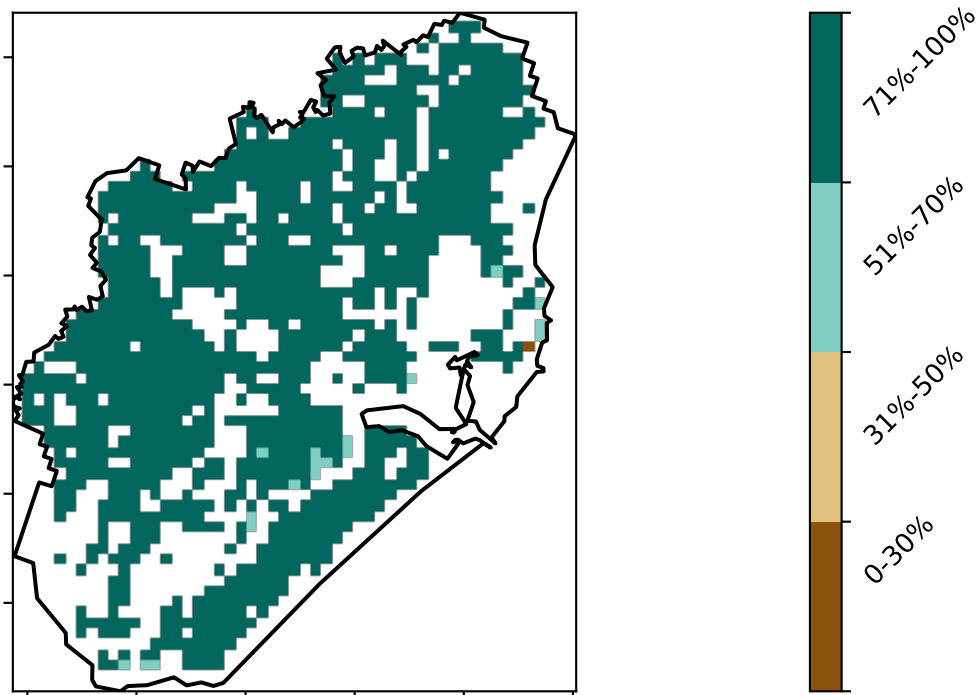
Land use and forest cover



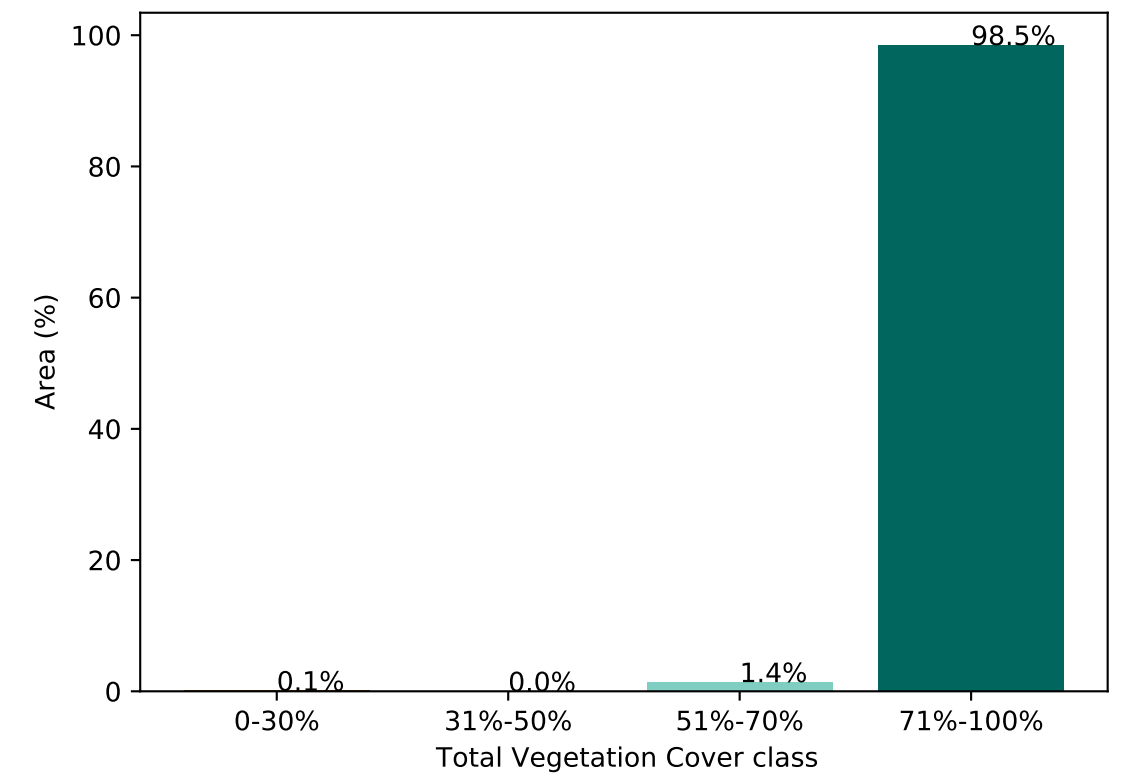
Proportion of each land class in area



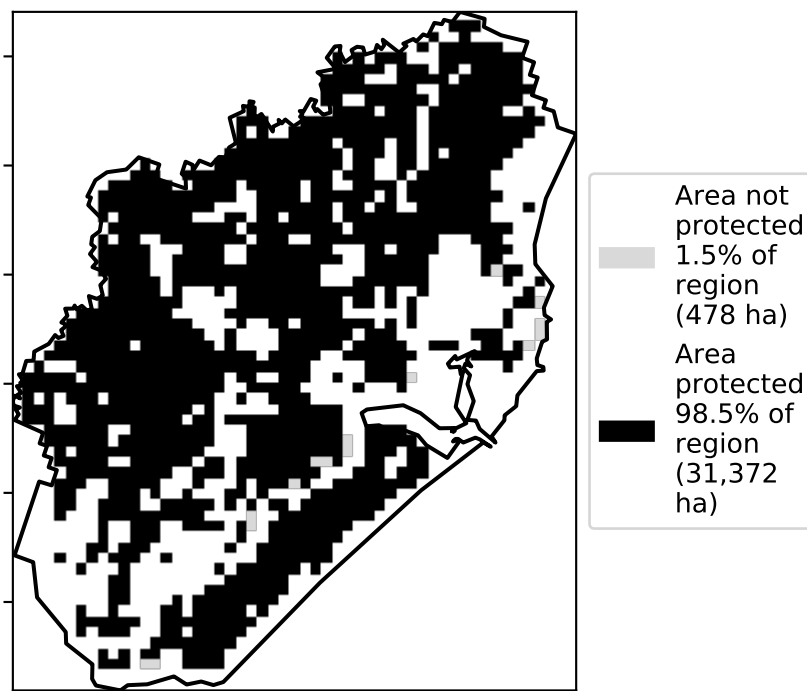
Total Vegetation Cover [%]



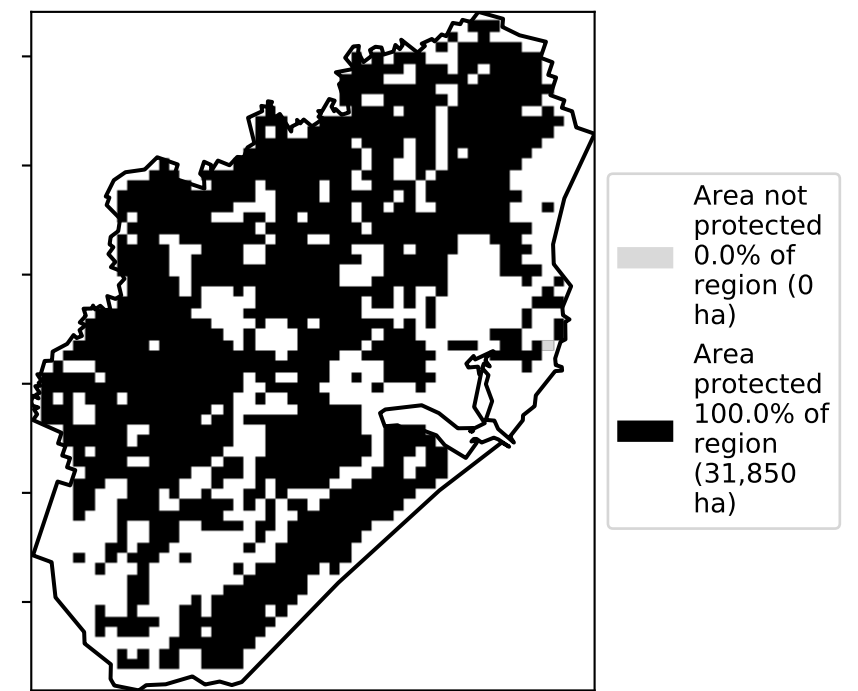
Proportion of vegetation cover class in area



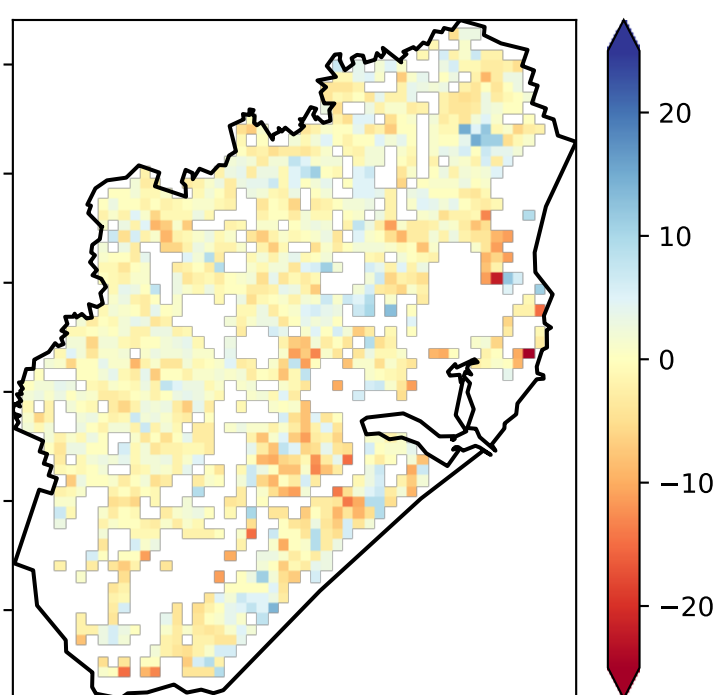
% Area protected from water erosion (>70%)



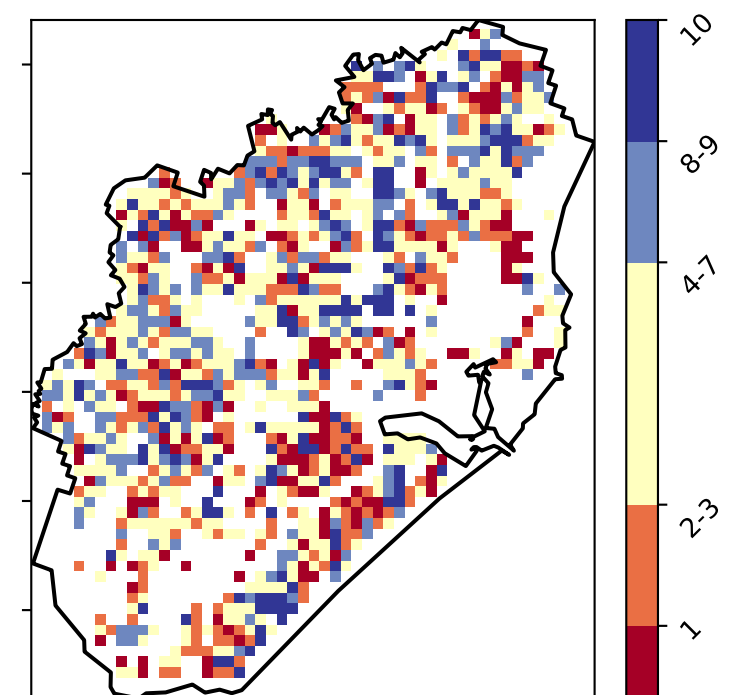
% Area protected from wind erosion (>50%)



Total Vegetation Cover Anomaly [%]



Total Vegetation Cover Decile [%]



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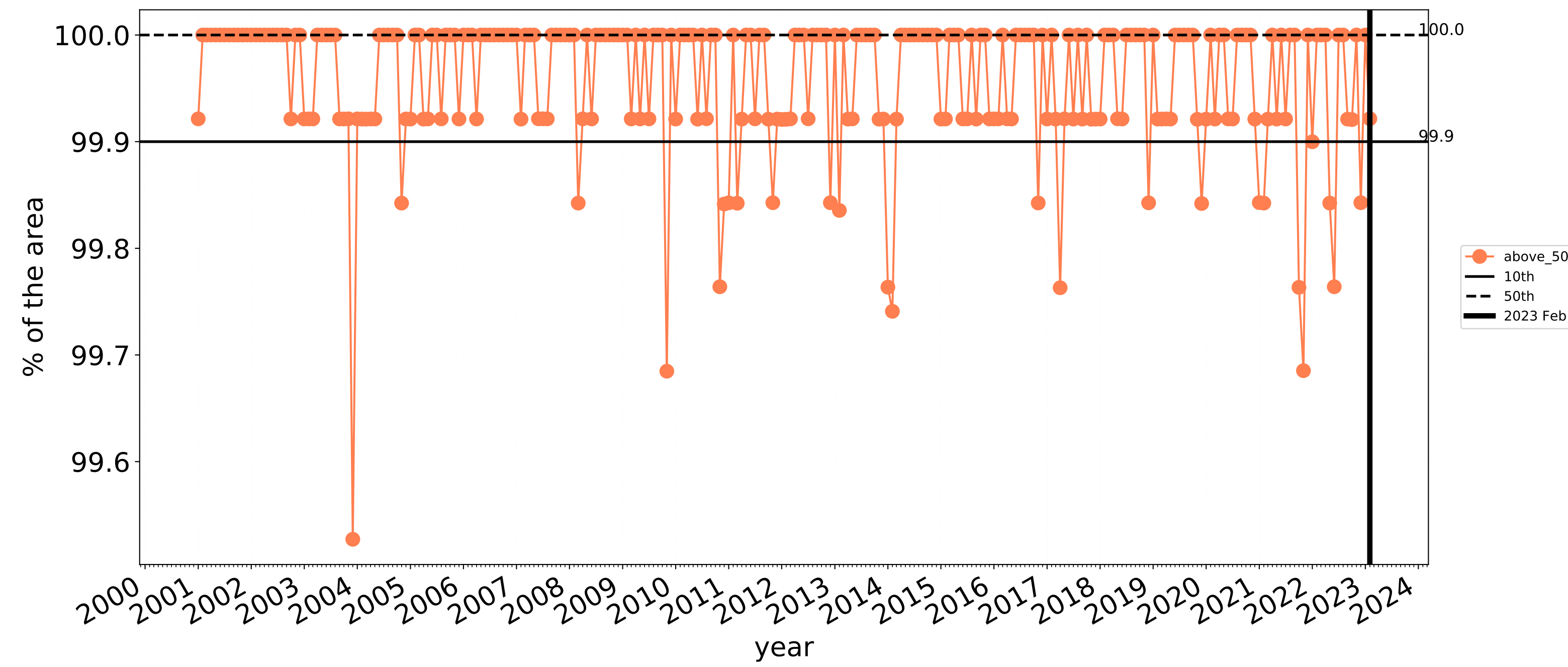
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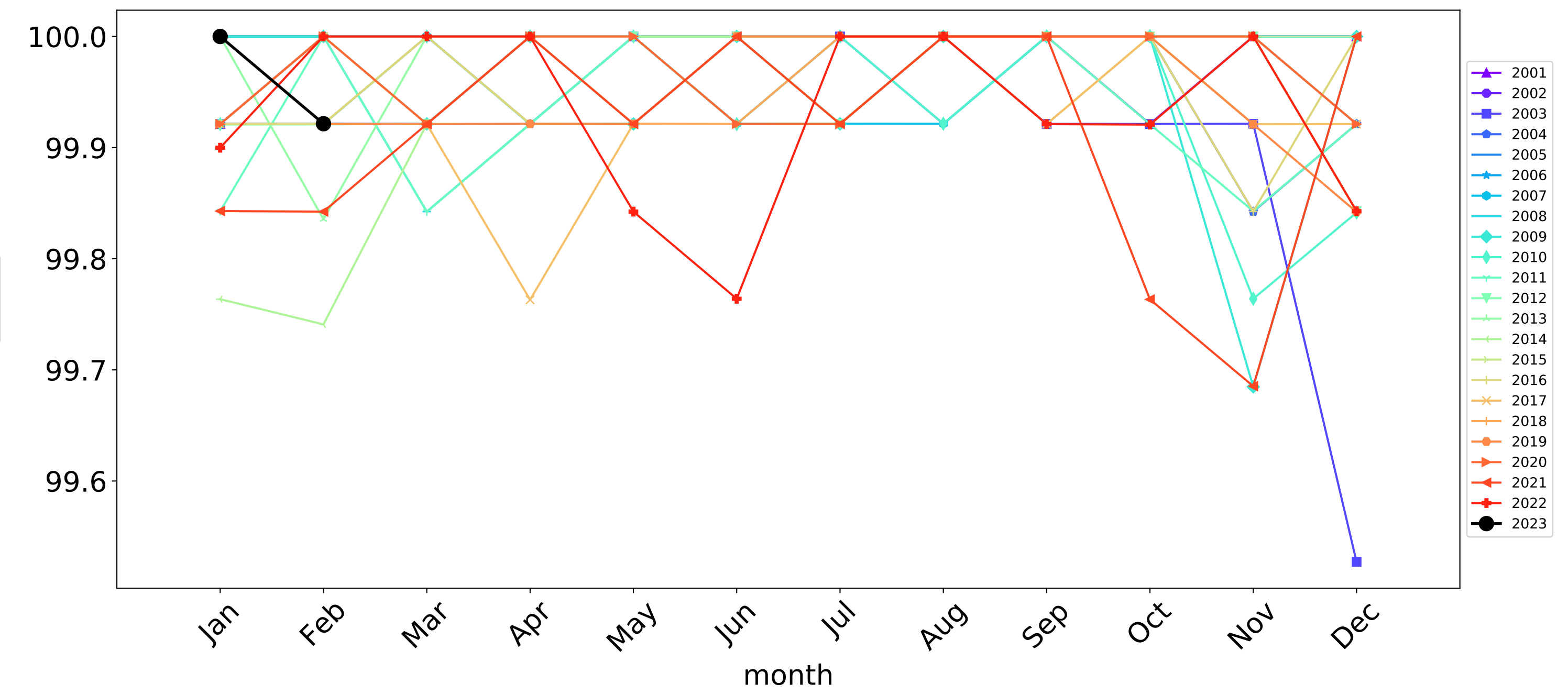


Agriculture timeseries

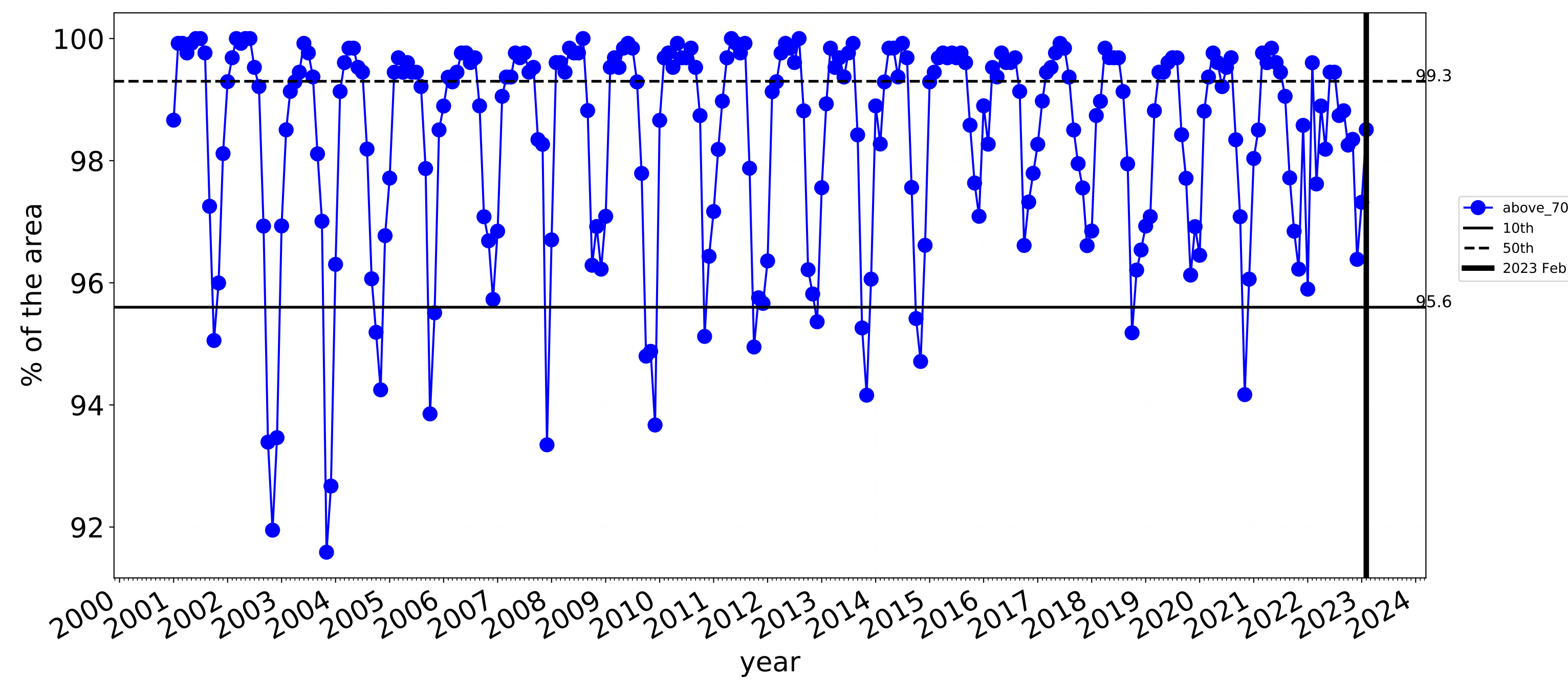
Proportion of the area protected from wind erosion (Total Vegetation Cover > 50%)



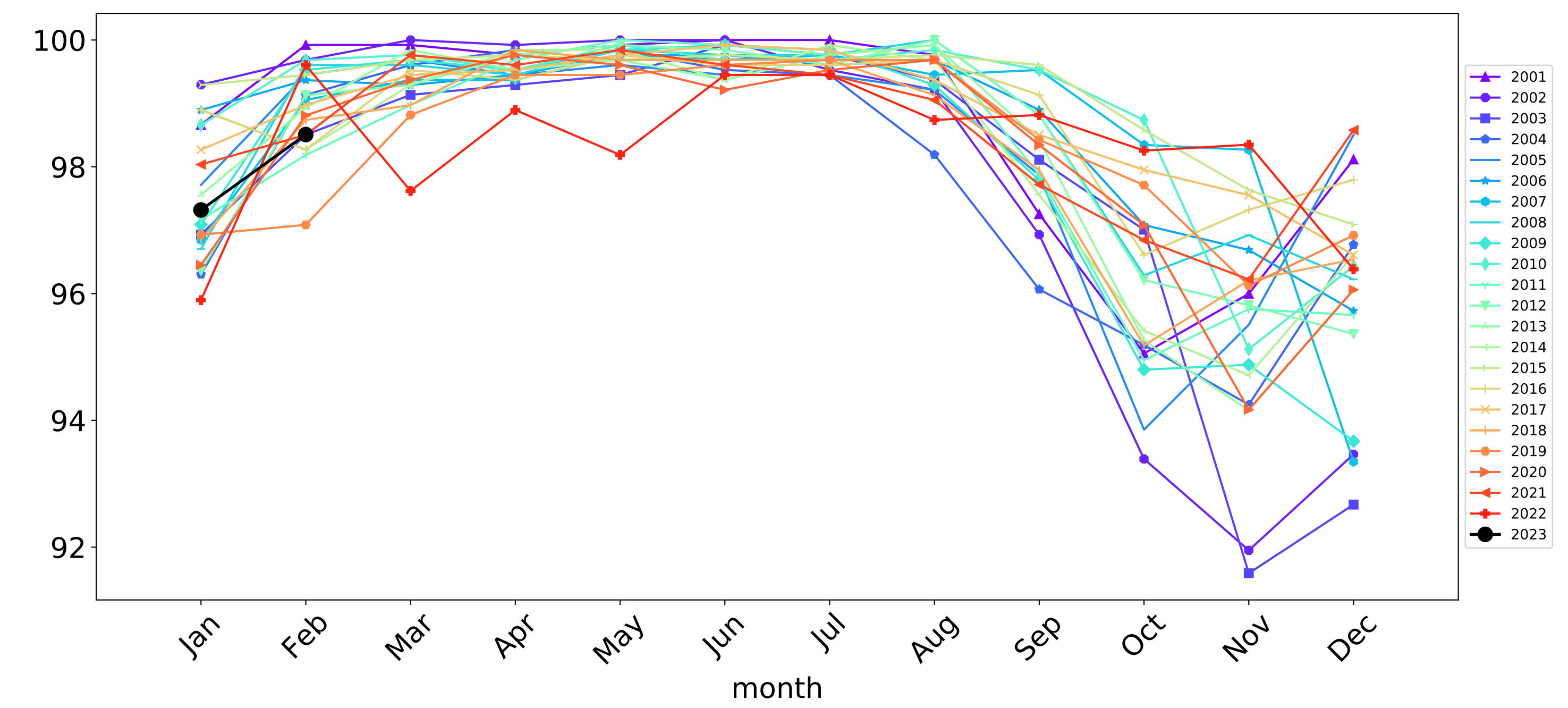
Wind erosion historical monthly area protected (Total Veg Cov >50%)

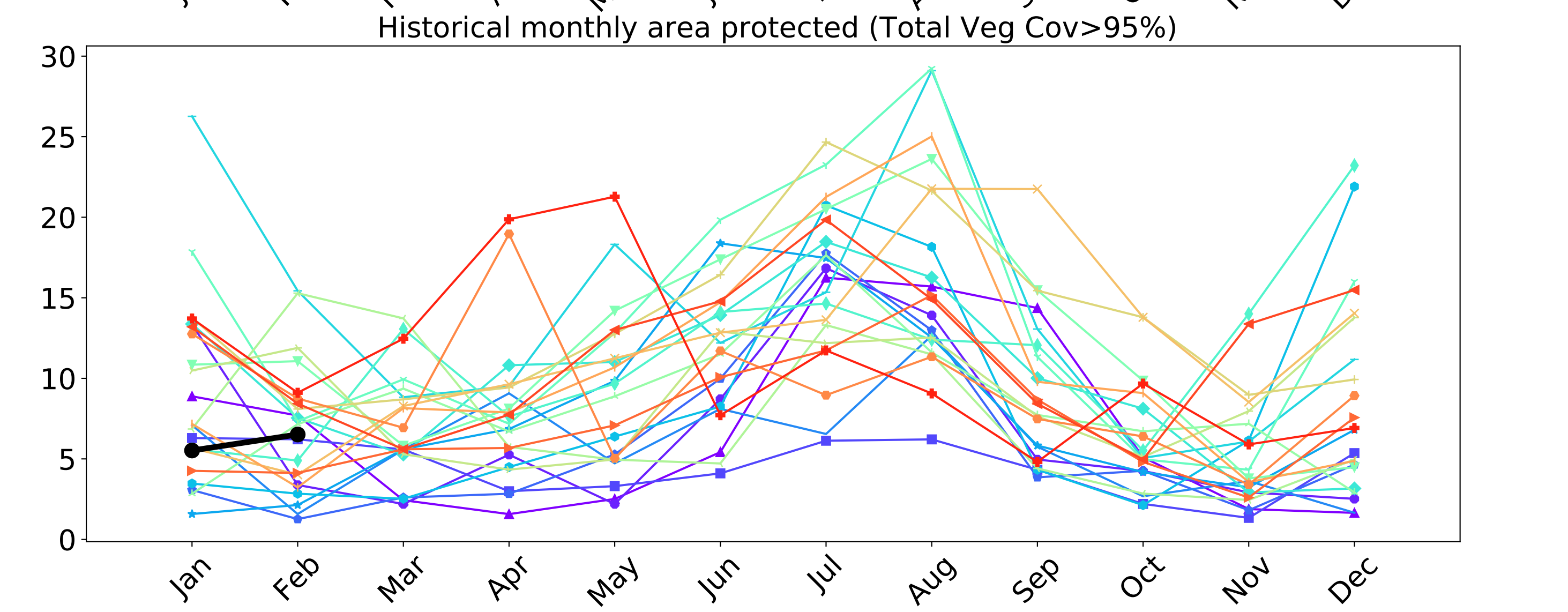
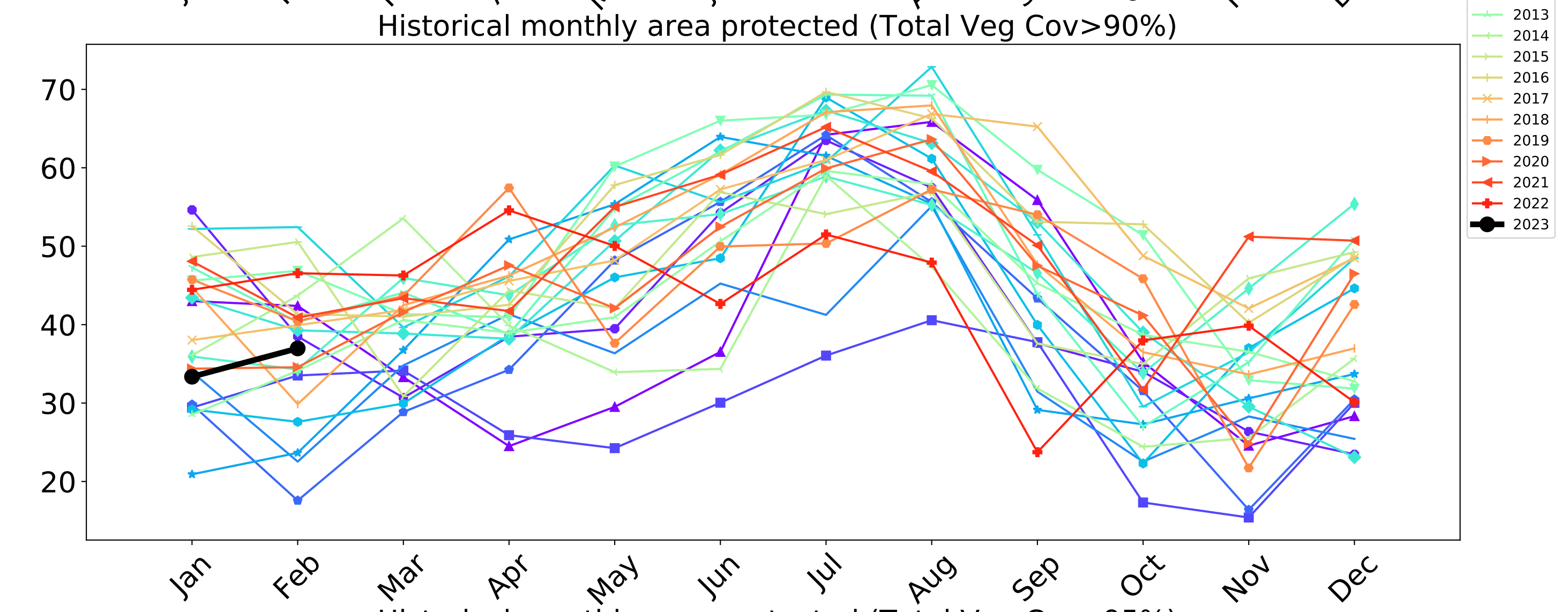
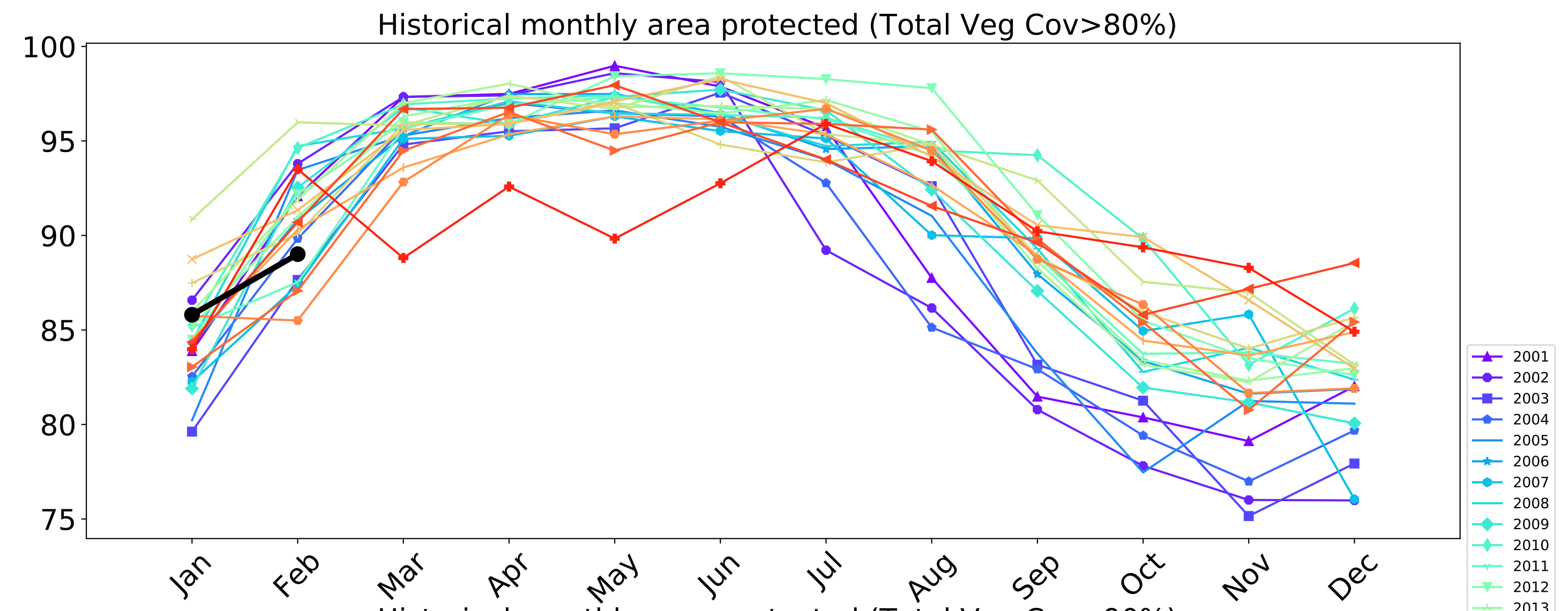
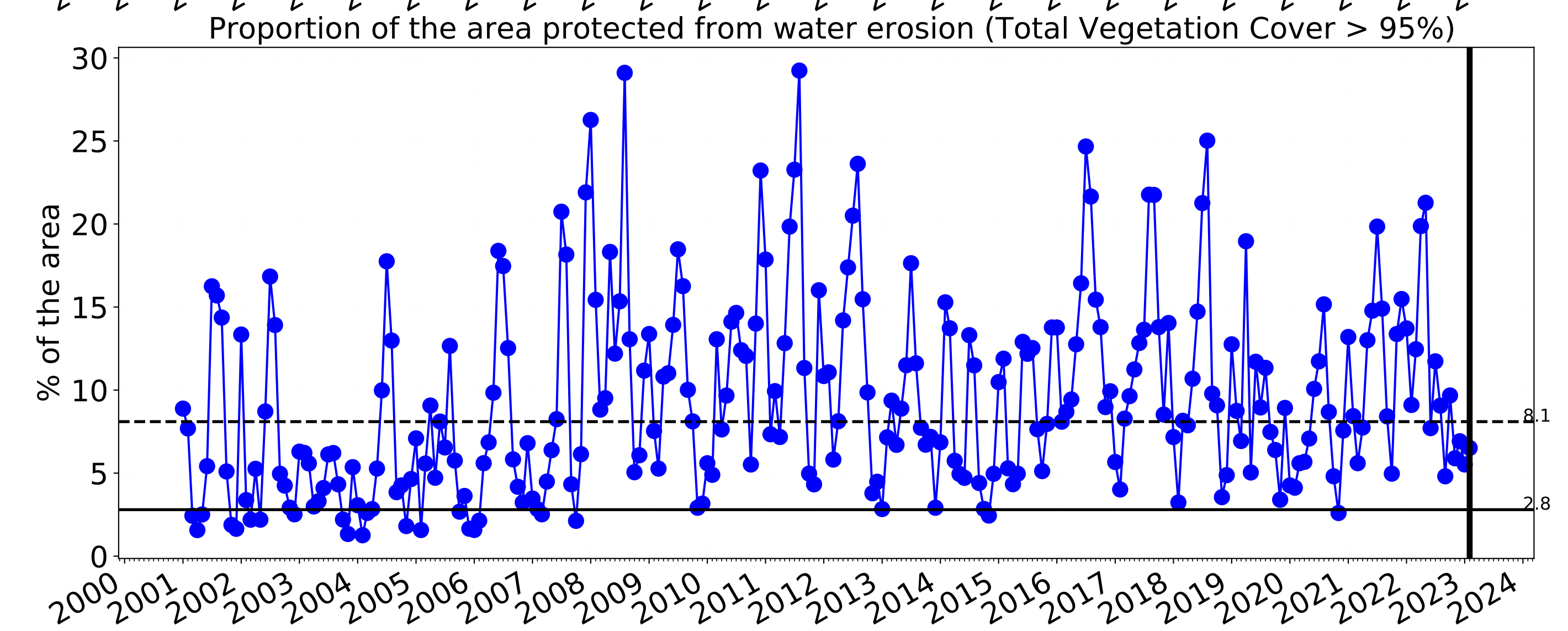
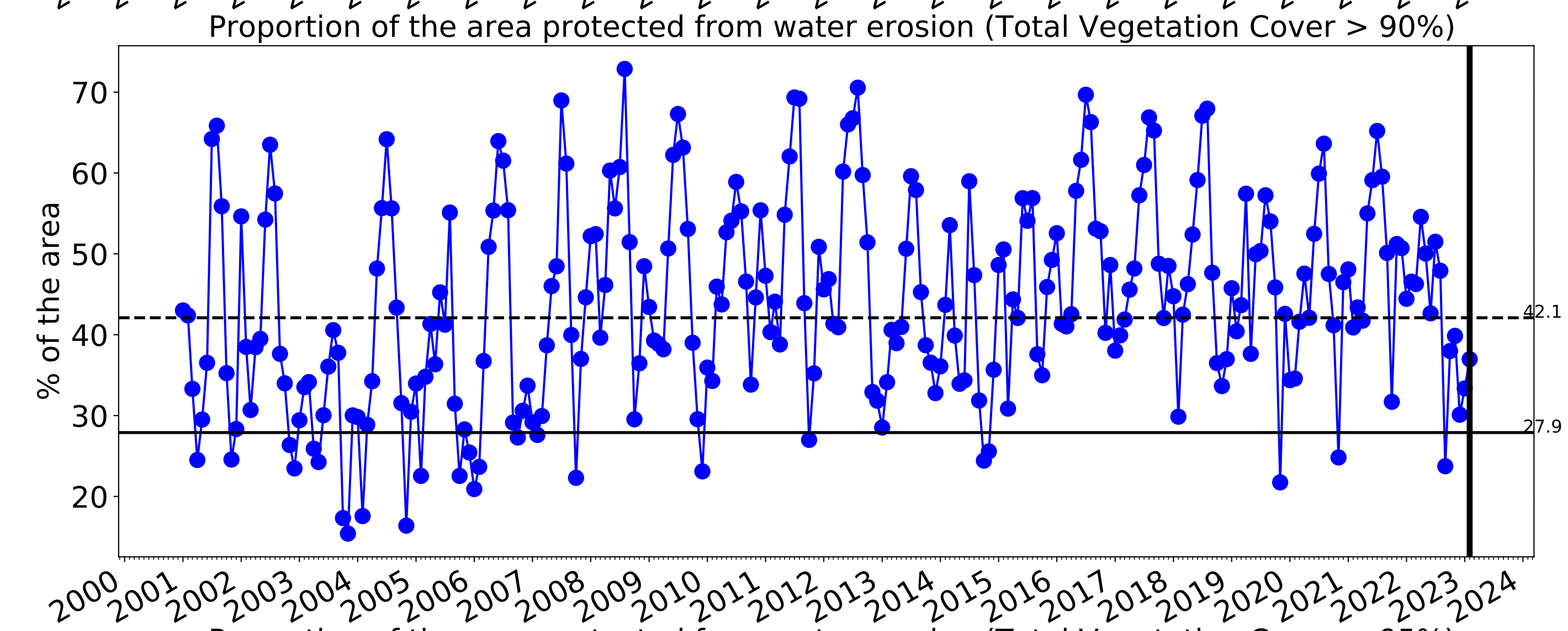
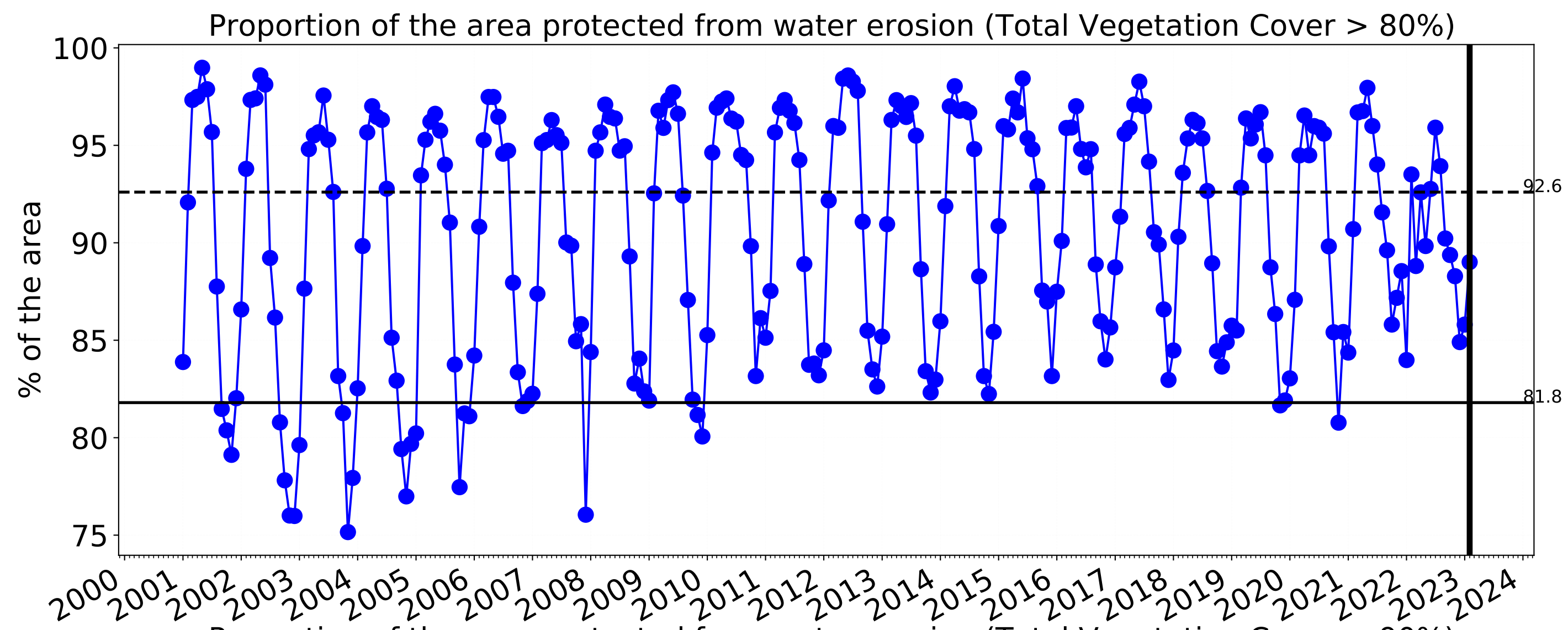


Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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

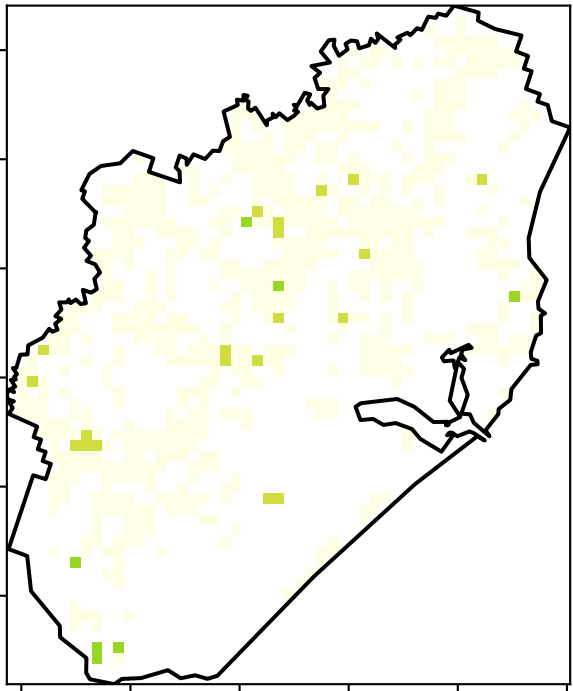




Grazing

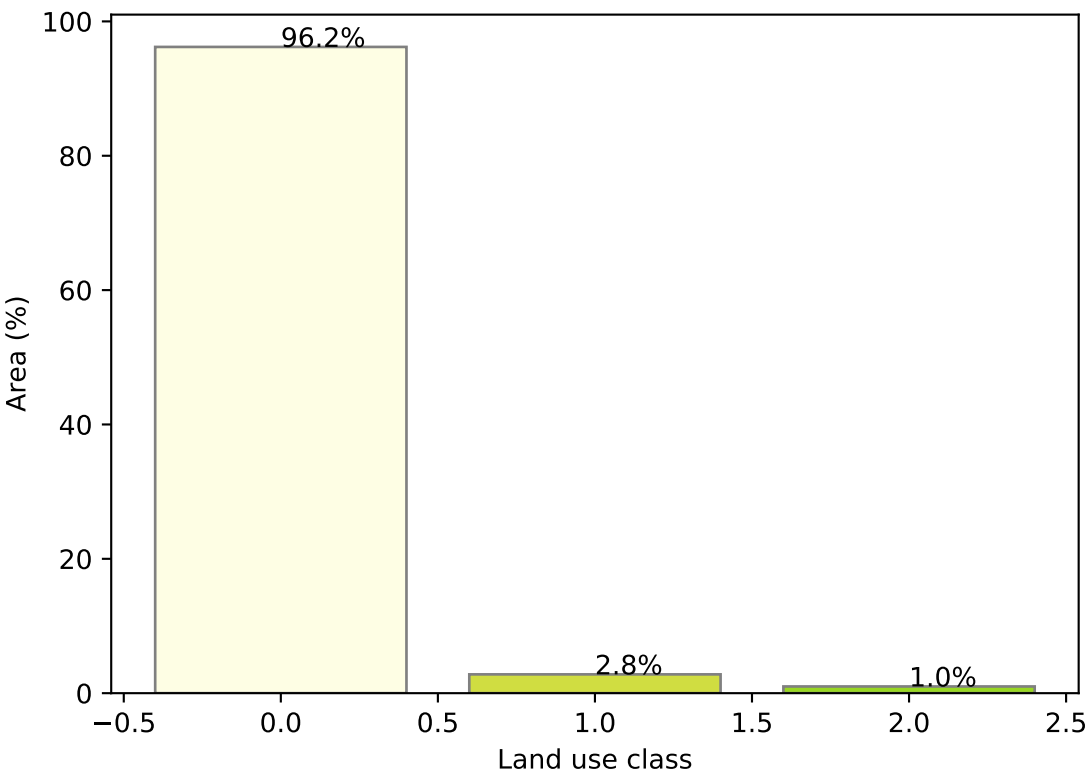
Land use and forest cover

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

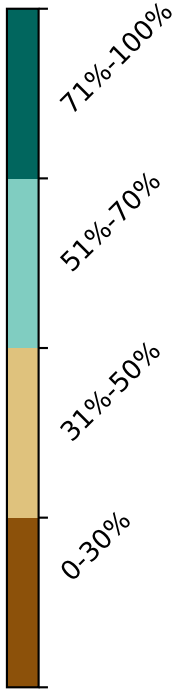
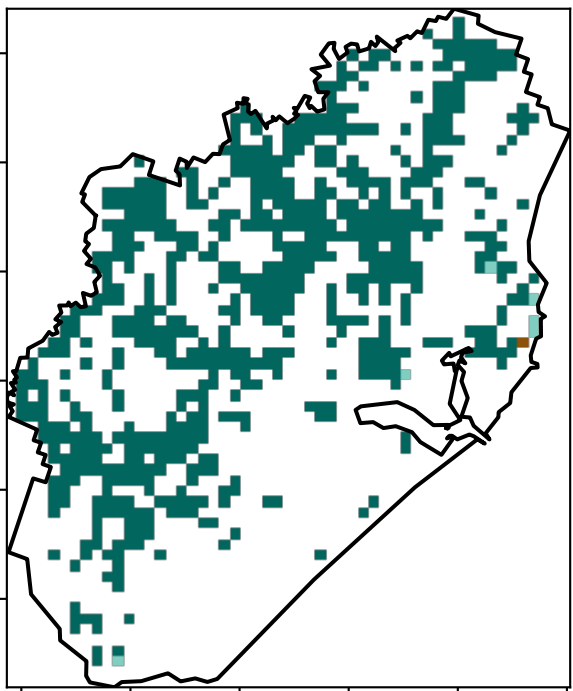


- 1 Agriculture - Grazing - Non forest
- 2 Agriculture - Grazing - Woodland forest
- 3 Agriculture - Grazing - Non-woodland forest

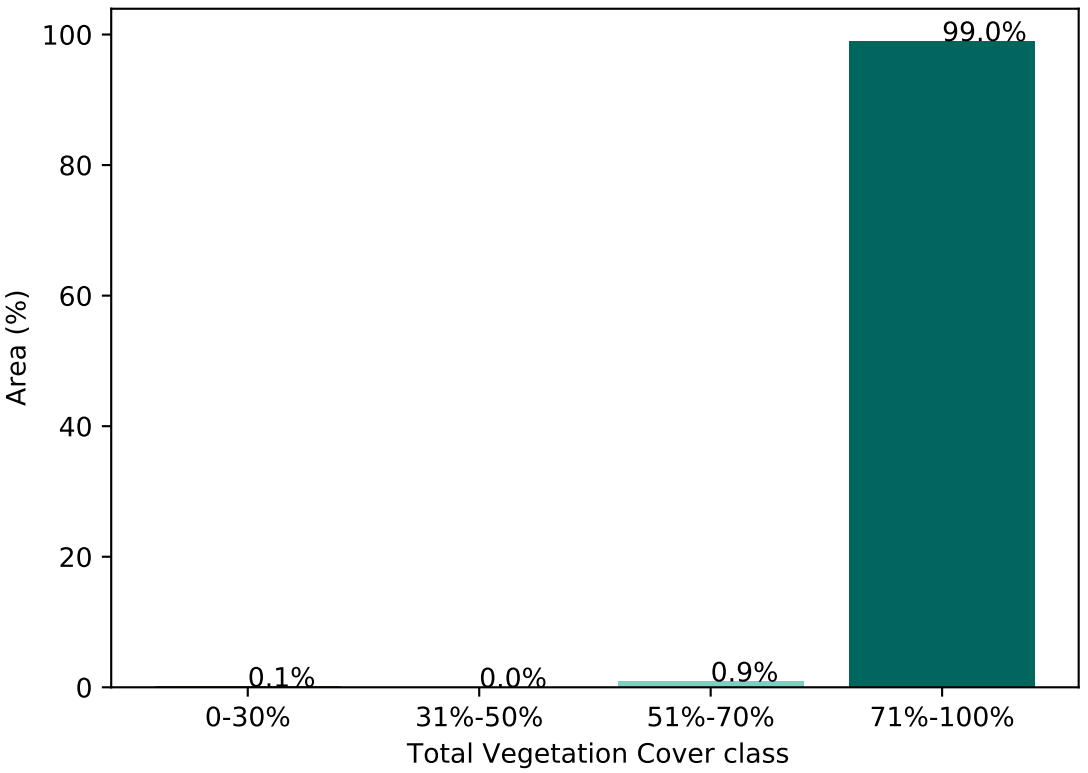
Proportion of each land class in area



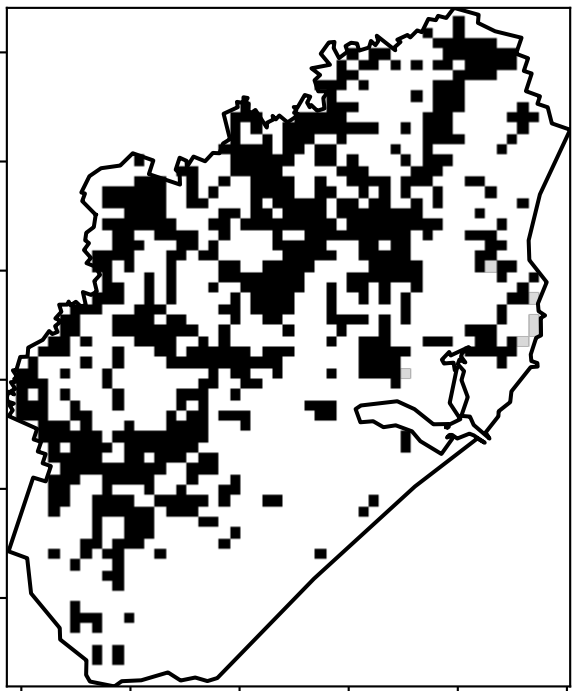
Total Vegetation Cover [%]



Proportion of vegetation cover class in area

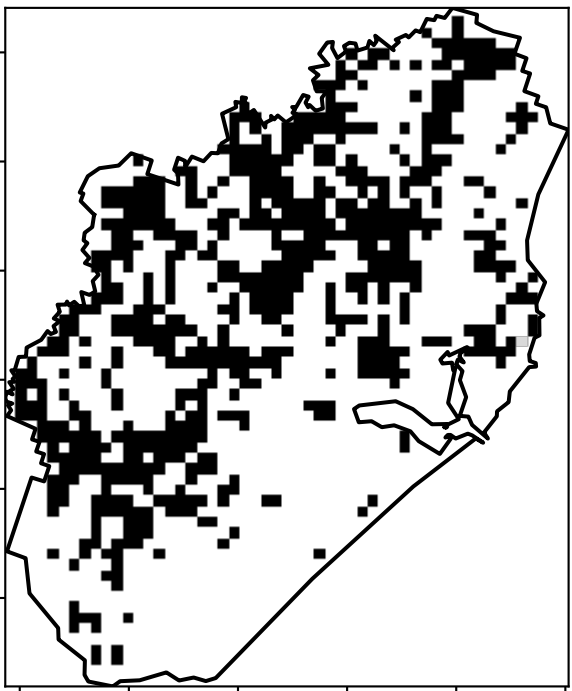


% Area protected from water erosion (>70%)



- Area not protected
1.0% of region
(174 ha)
- Area protected
99.0% of region
(17,176 ha)

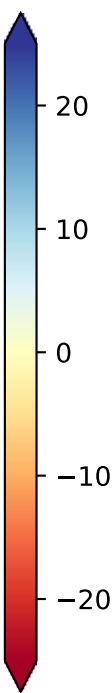
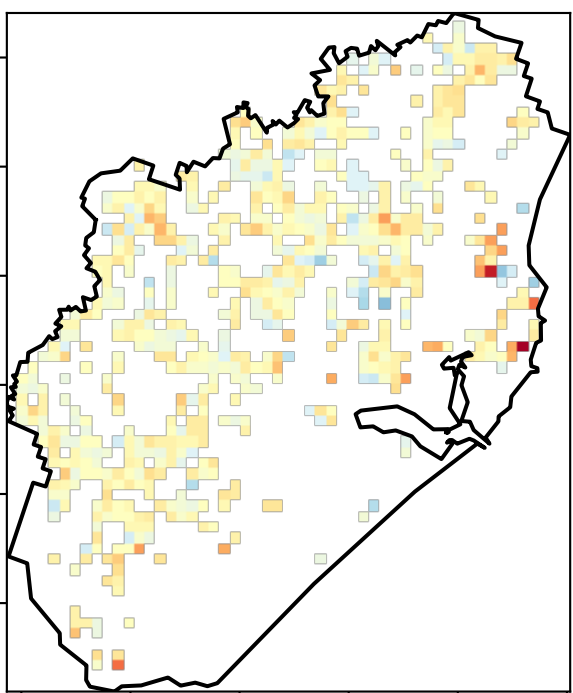
% Area protected from wind erosion (>50%)



- Area not protected
0.0% of region (0 ha)
- Area protected
100.0% of region
(17,350 ha)

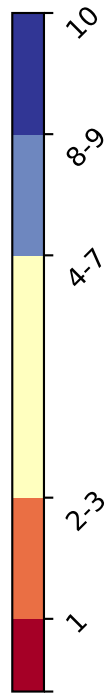
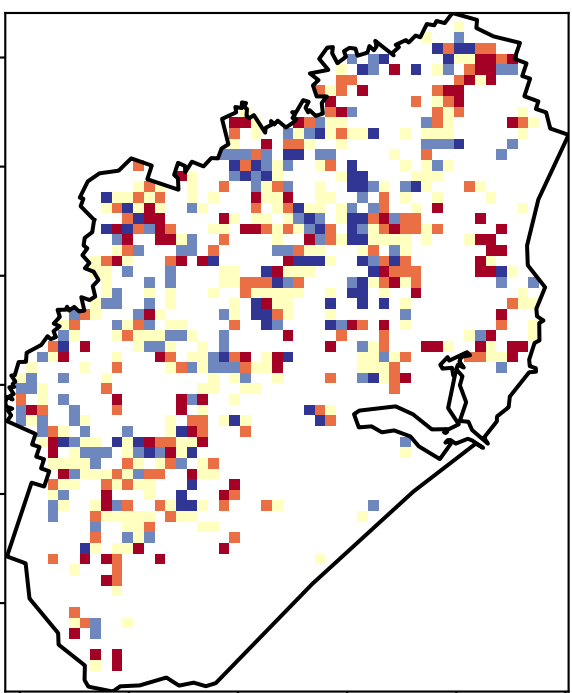
Total Vegetation Cover Anomaly [%]

Anomaly show how many percentage 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 [%]



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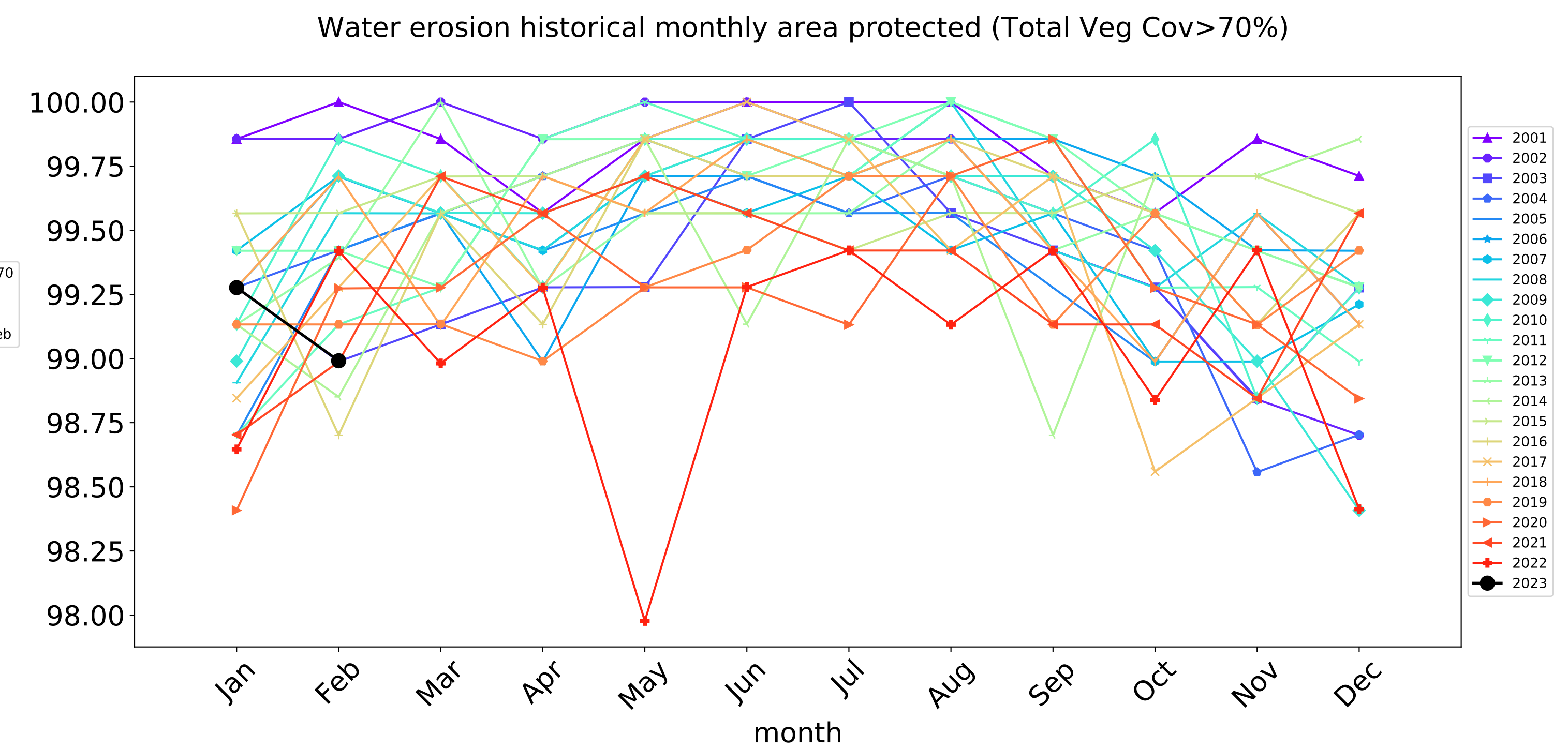
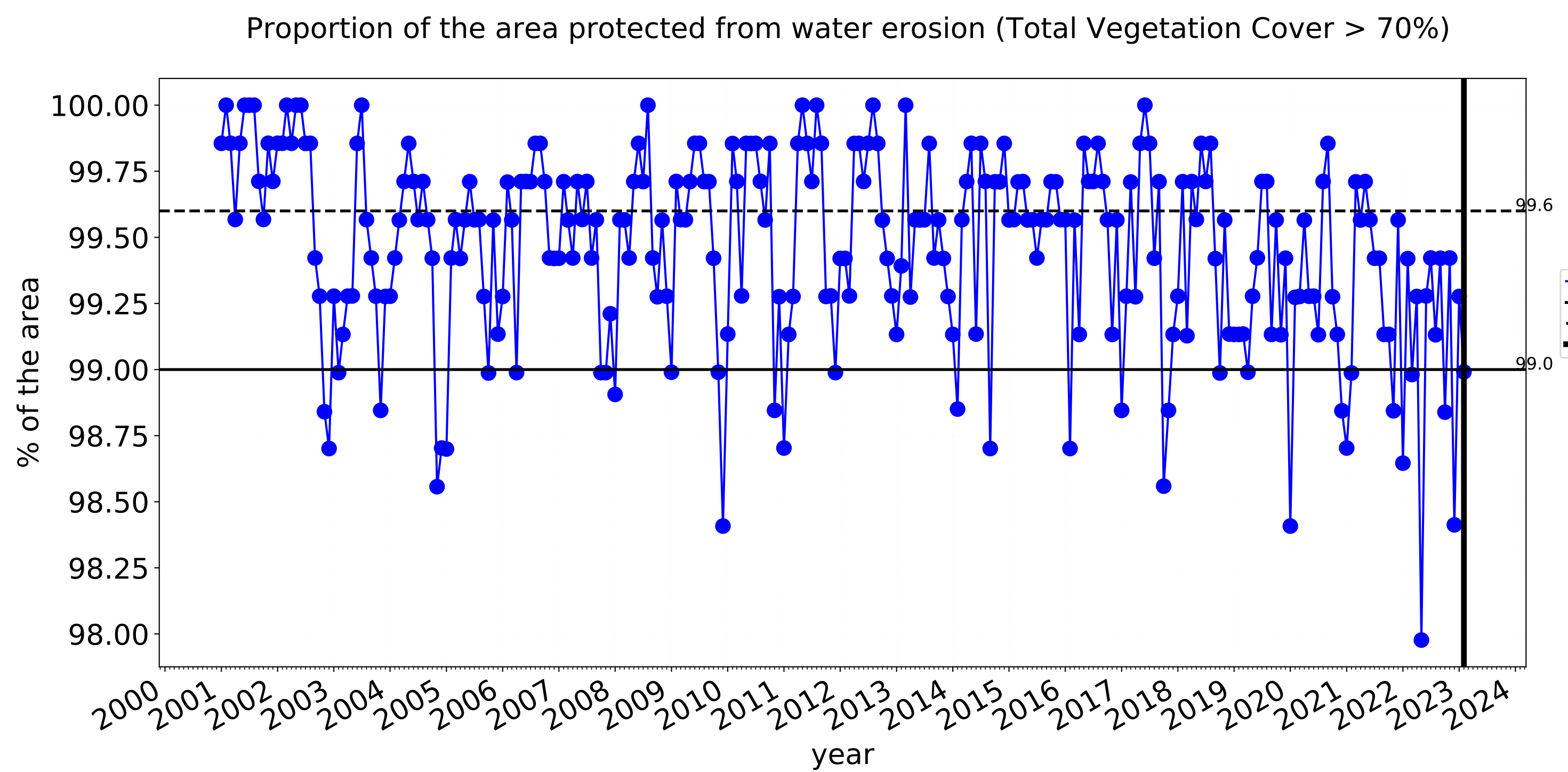
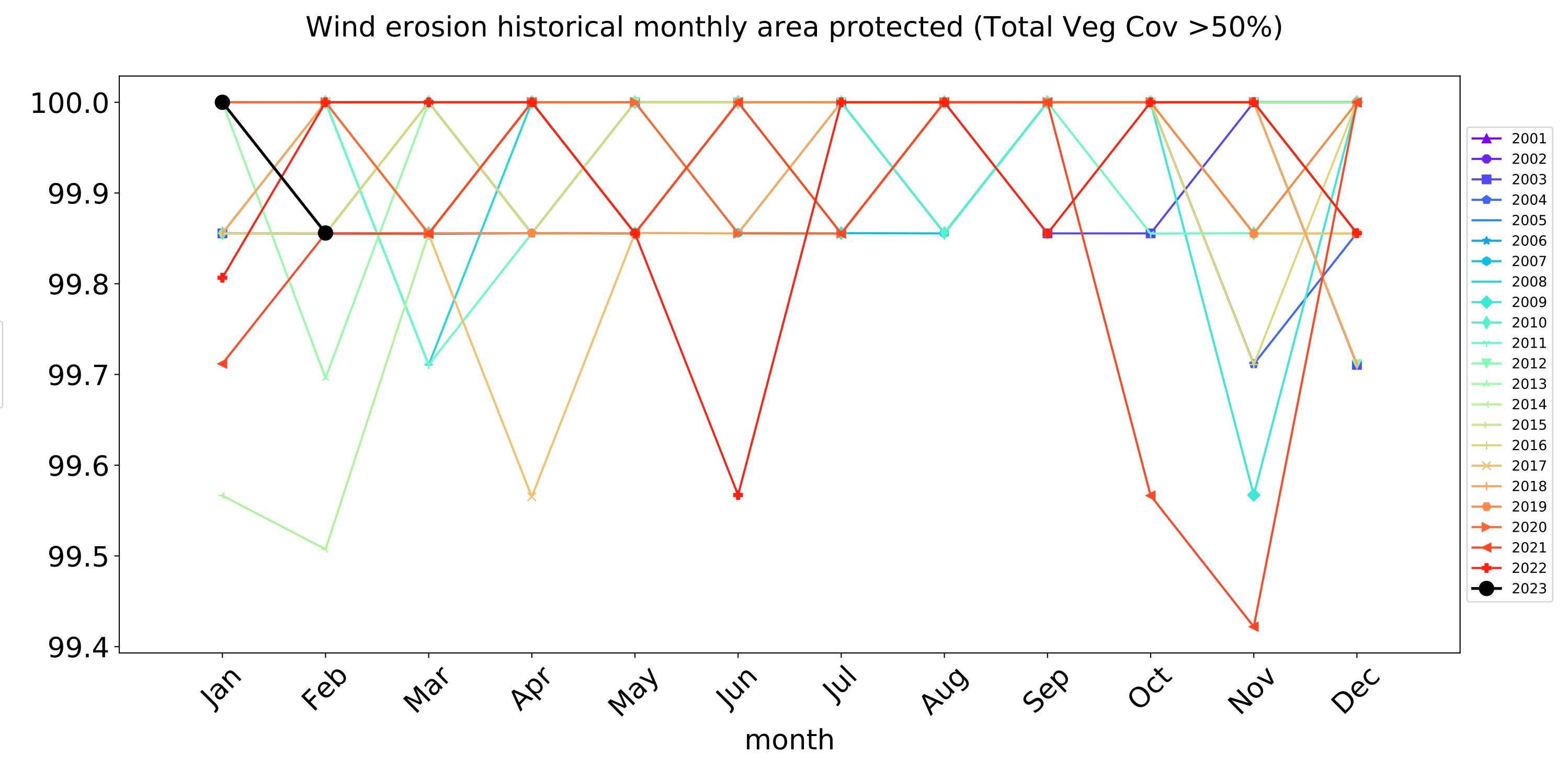
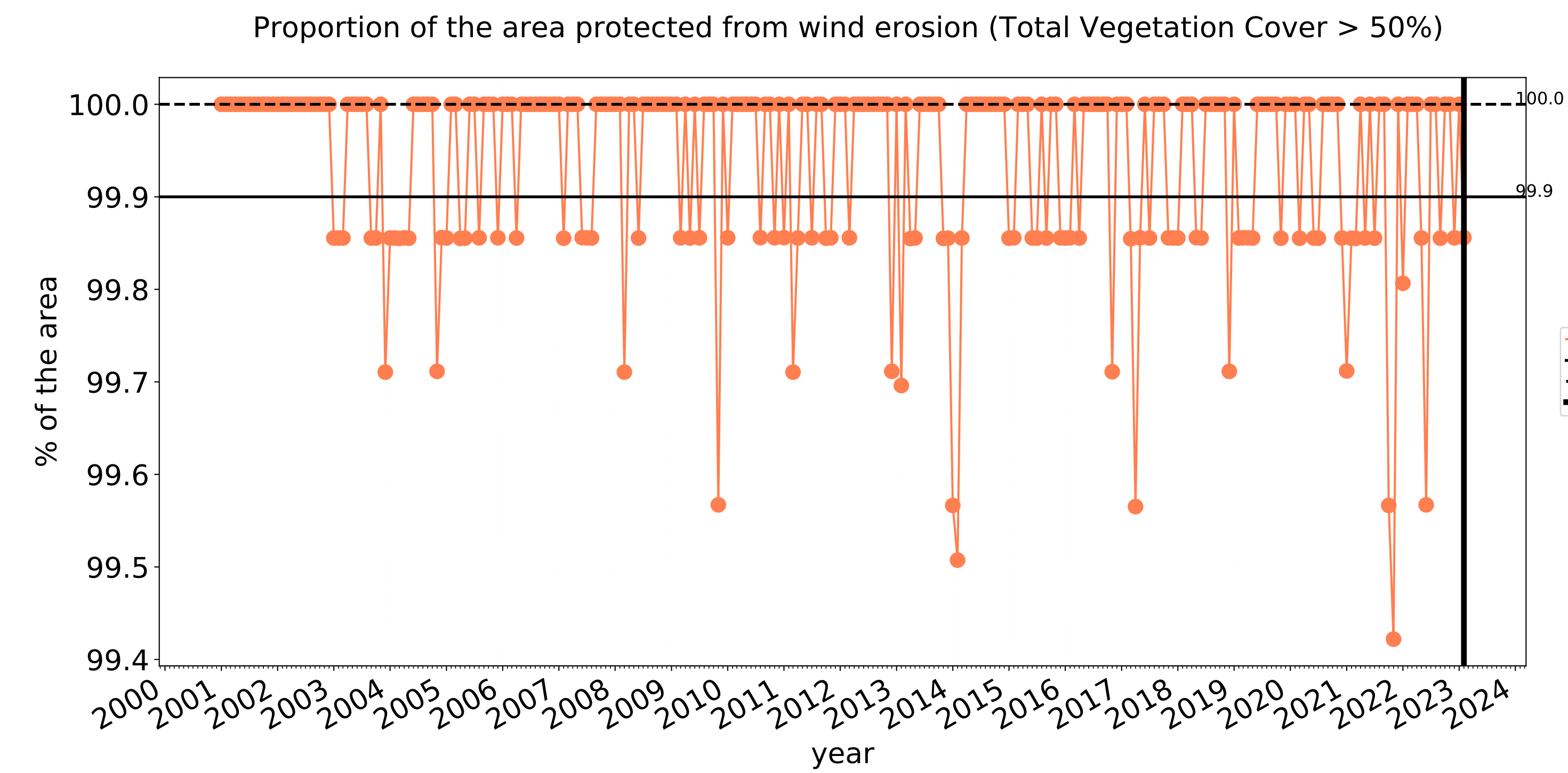


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Grazing timeseries

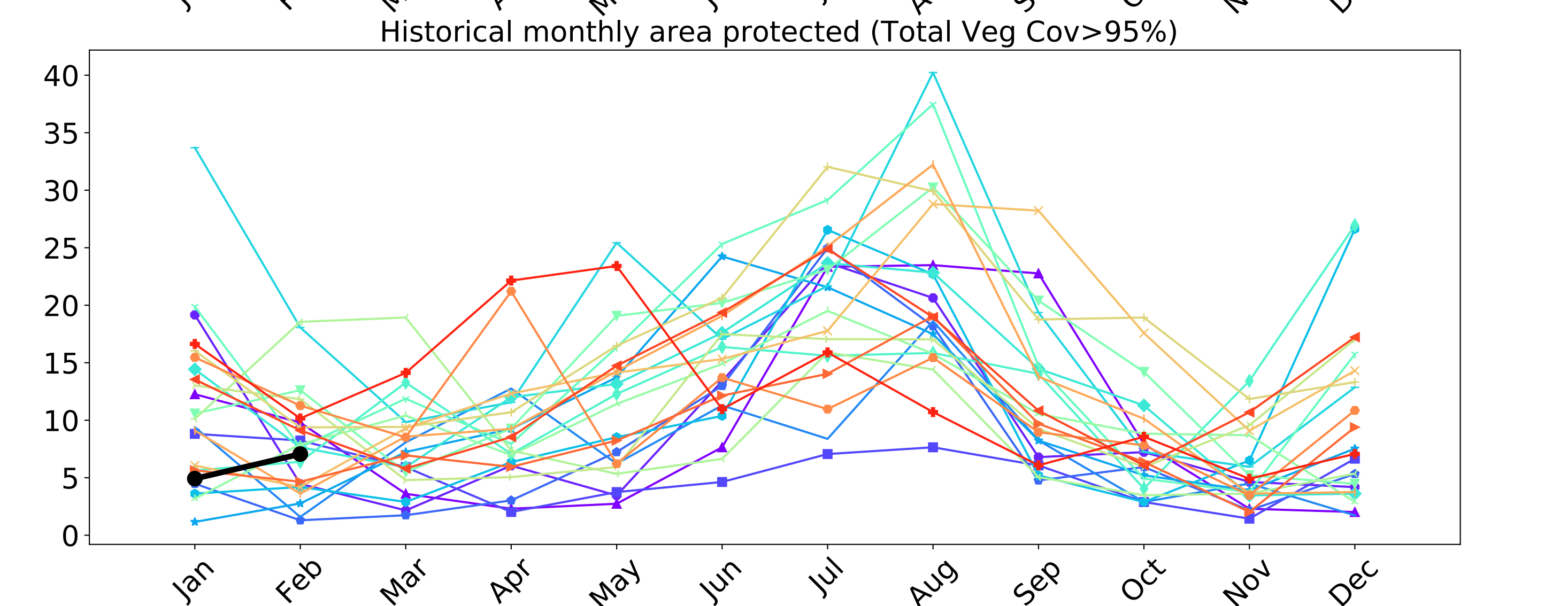
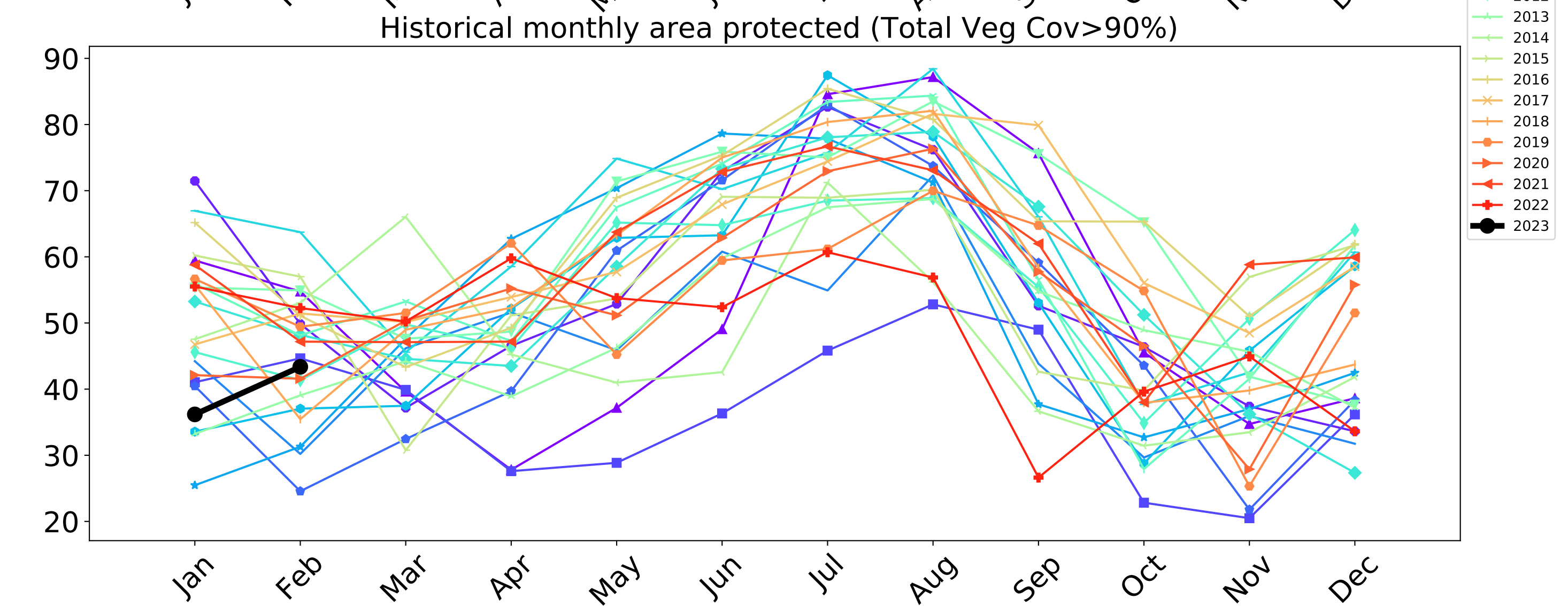
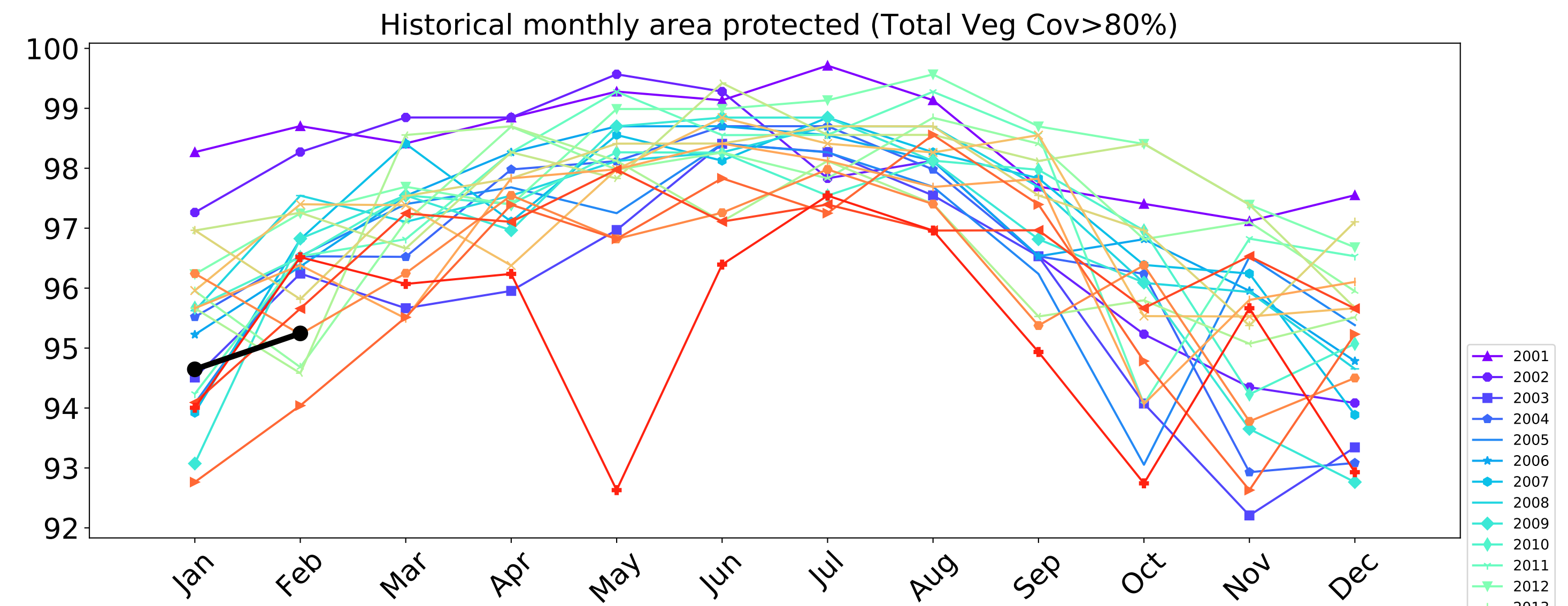
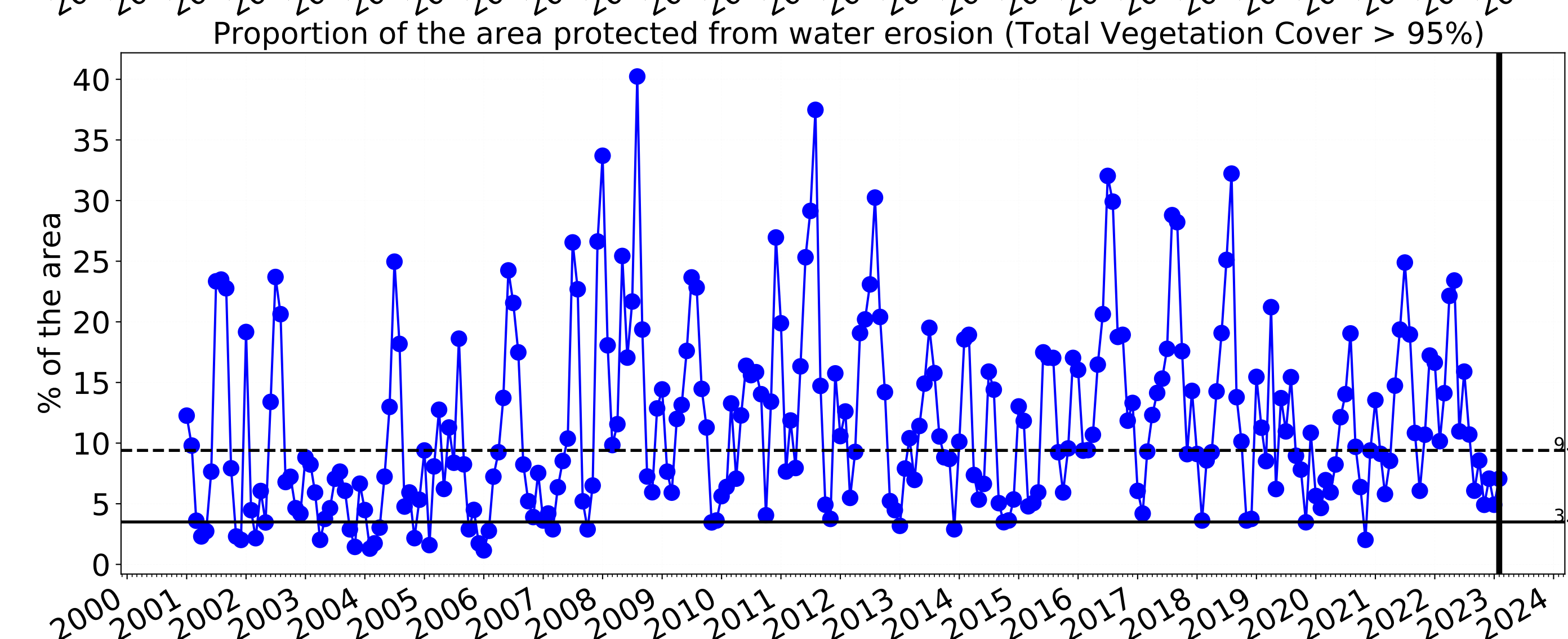
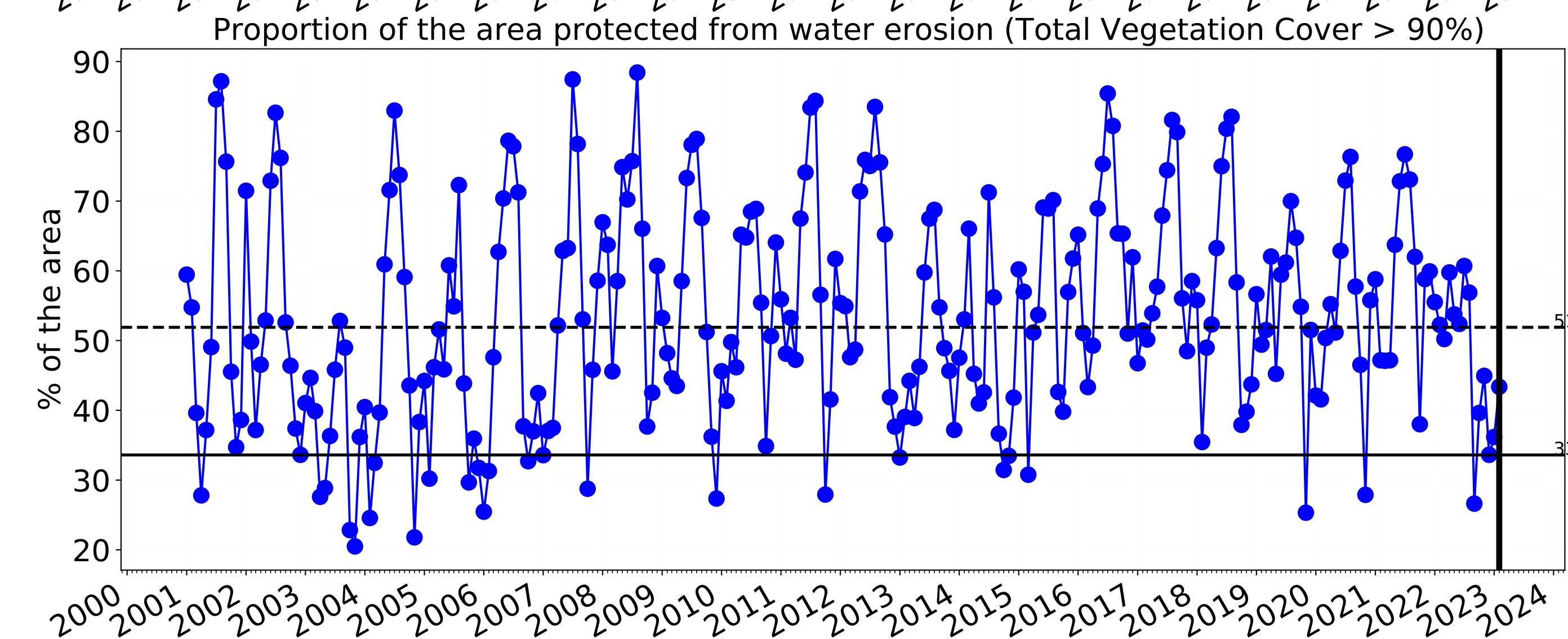
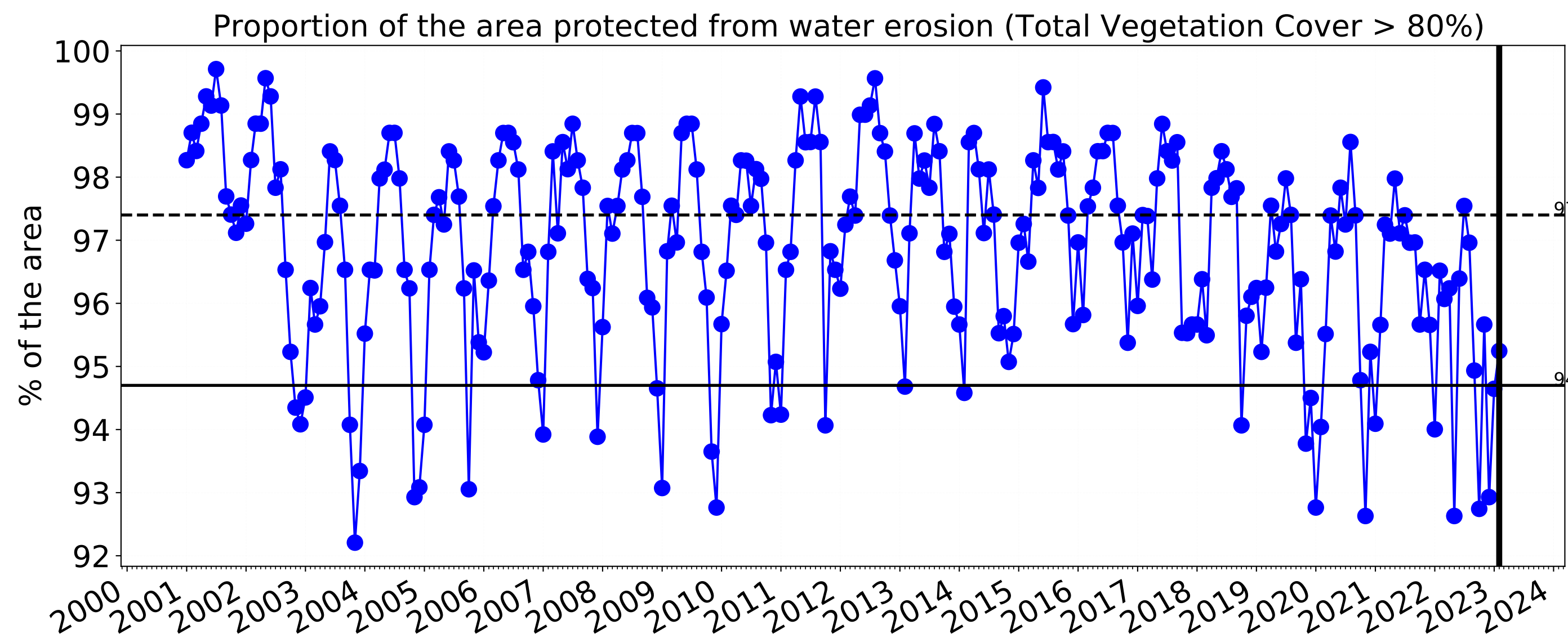


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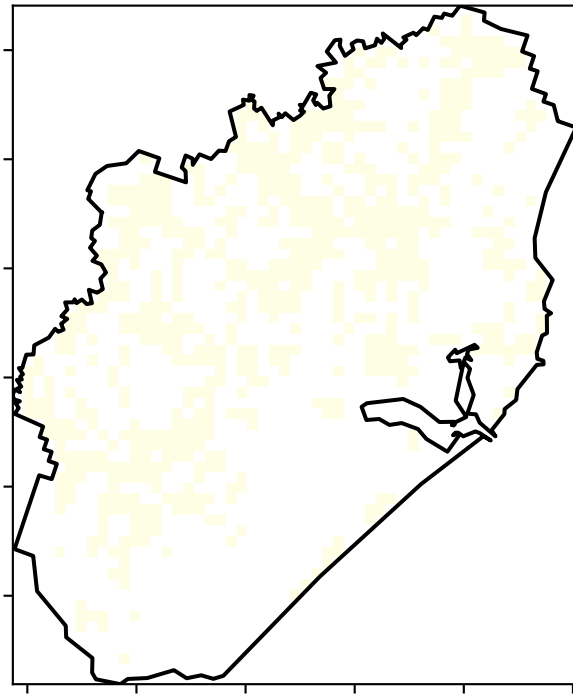
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Grazing non forest

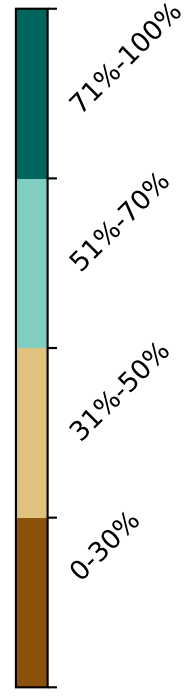
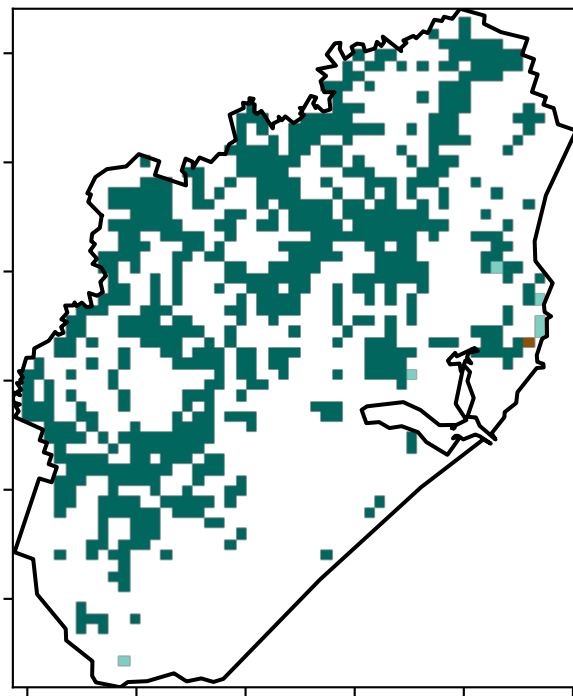
Land use and forest cover



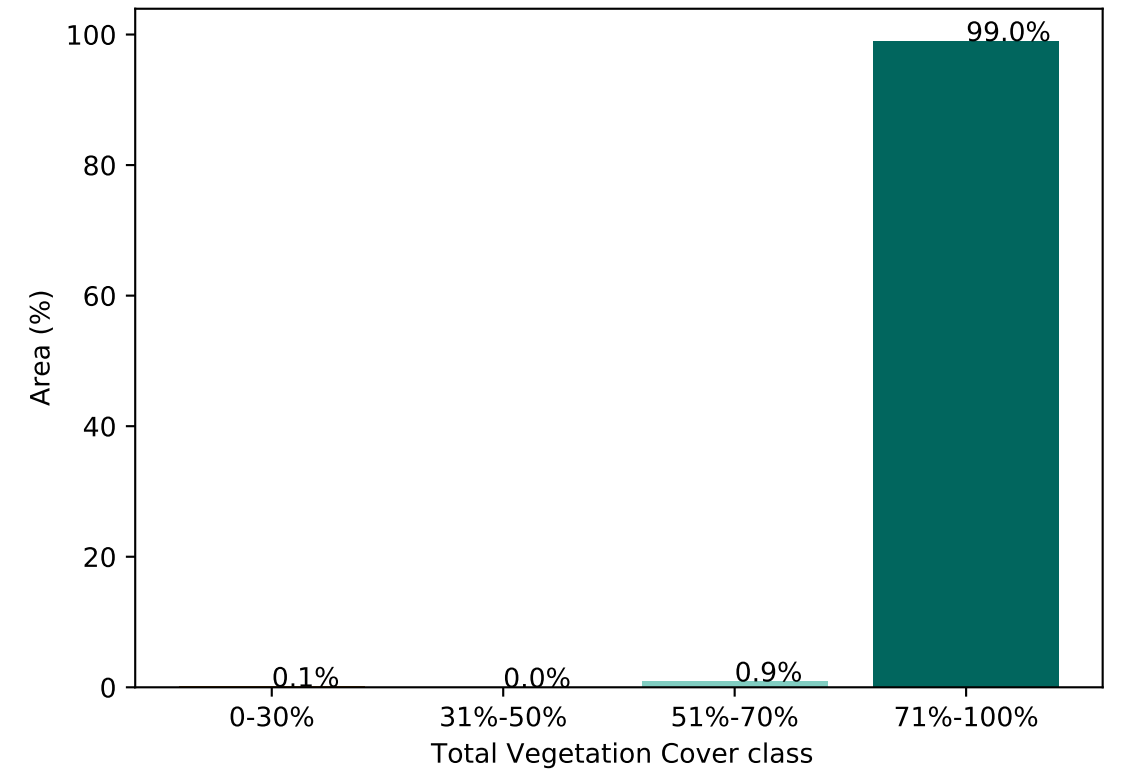
1 Agriculture - Grazing - Non forest

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

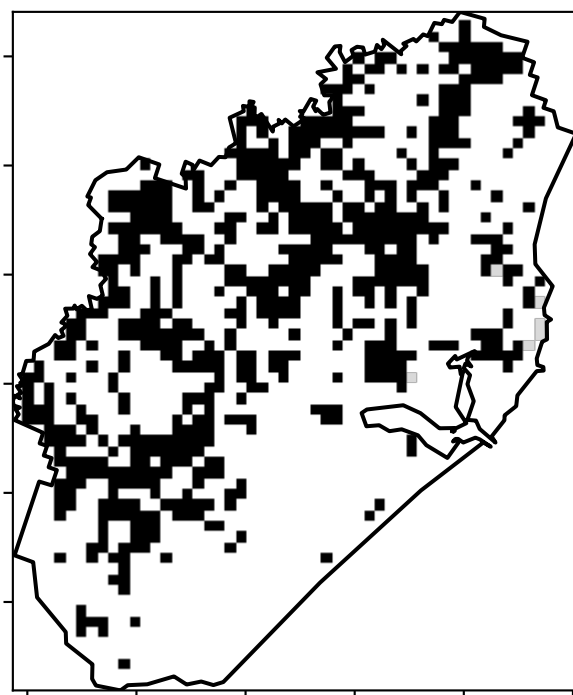
Total Vegetation Cover [%]



Proportion of vegetation cover class in area

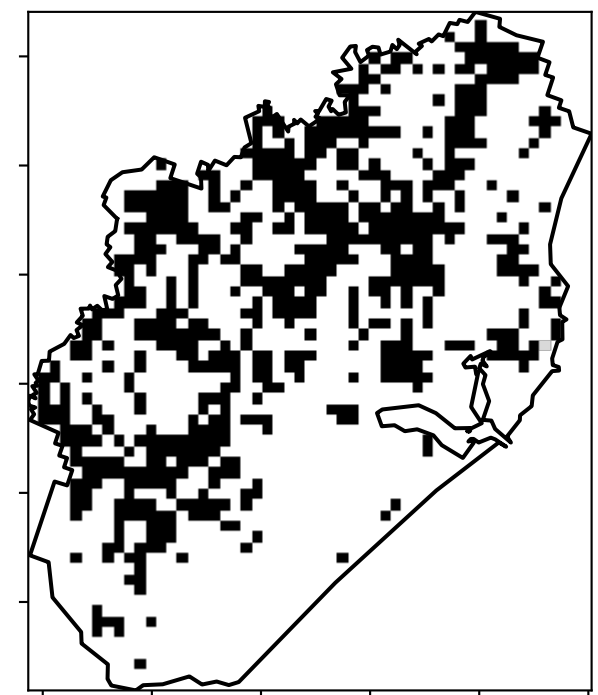


% Area protected from water erosion (>70%)



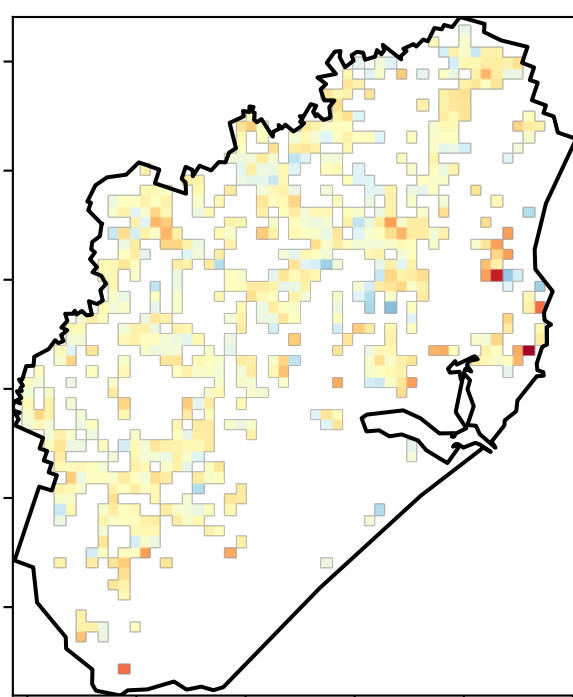
Area not protected
1.0% of
region
(167 ha)
Area protected
99.0% of
region
(16,508
ha)

% Area protected from wind erosion (>50%)



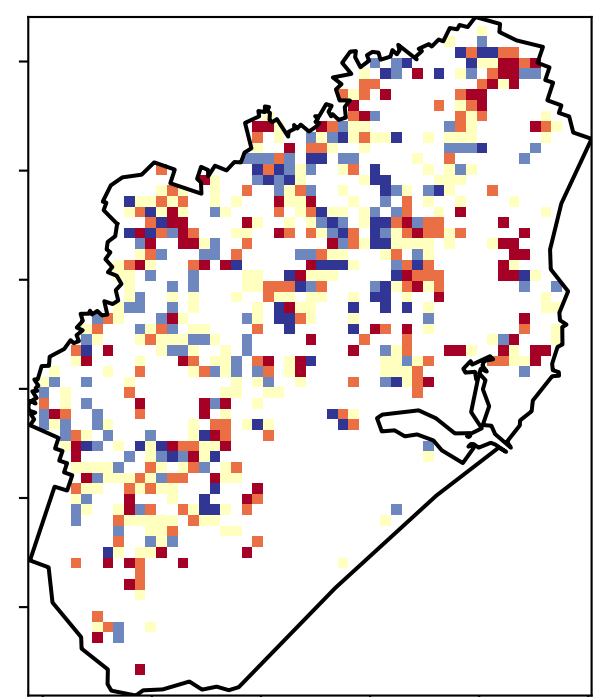
Area not protected
0.0% of
region (0
ha)
Area protected
100.0% of
region
(16,675
ha)

Total Vegetation Cover Anomaly [%]



Anomaly show how
many percentage
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.



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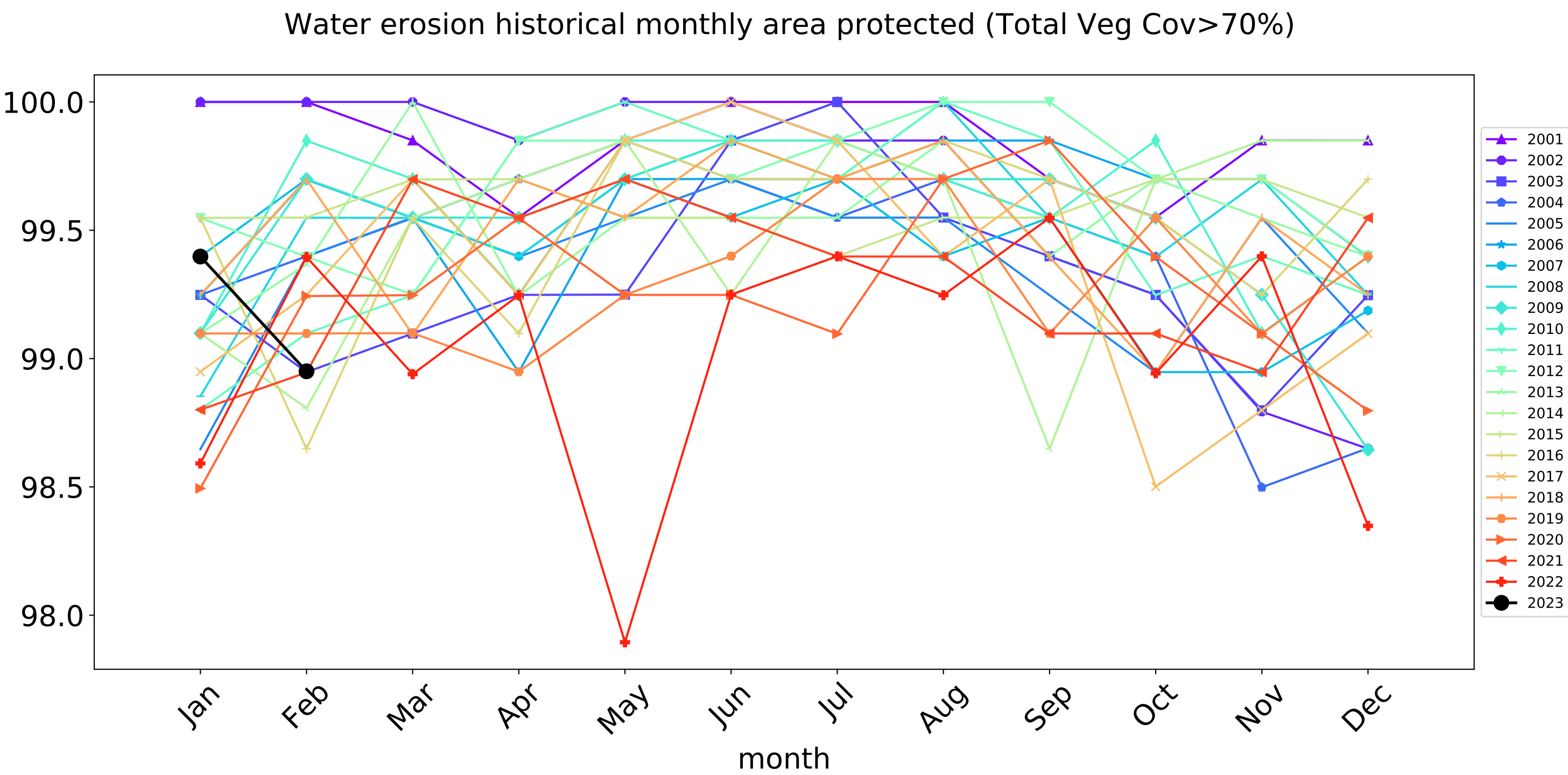
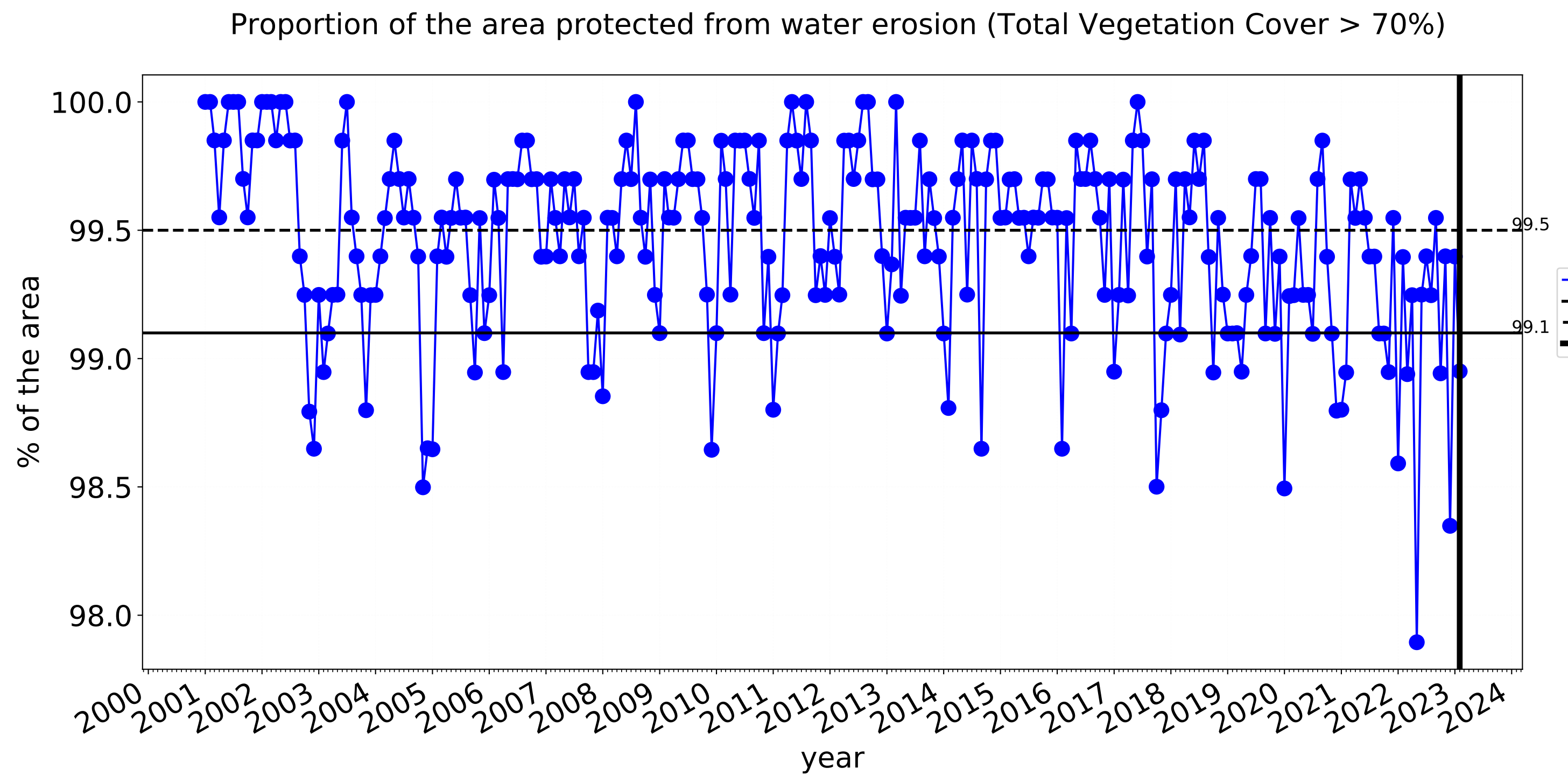
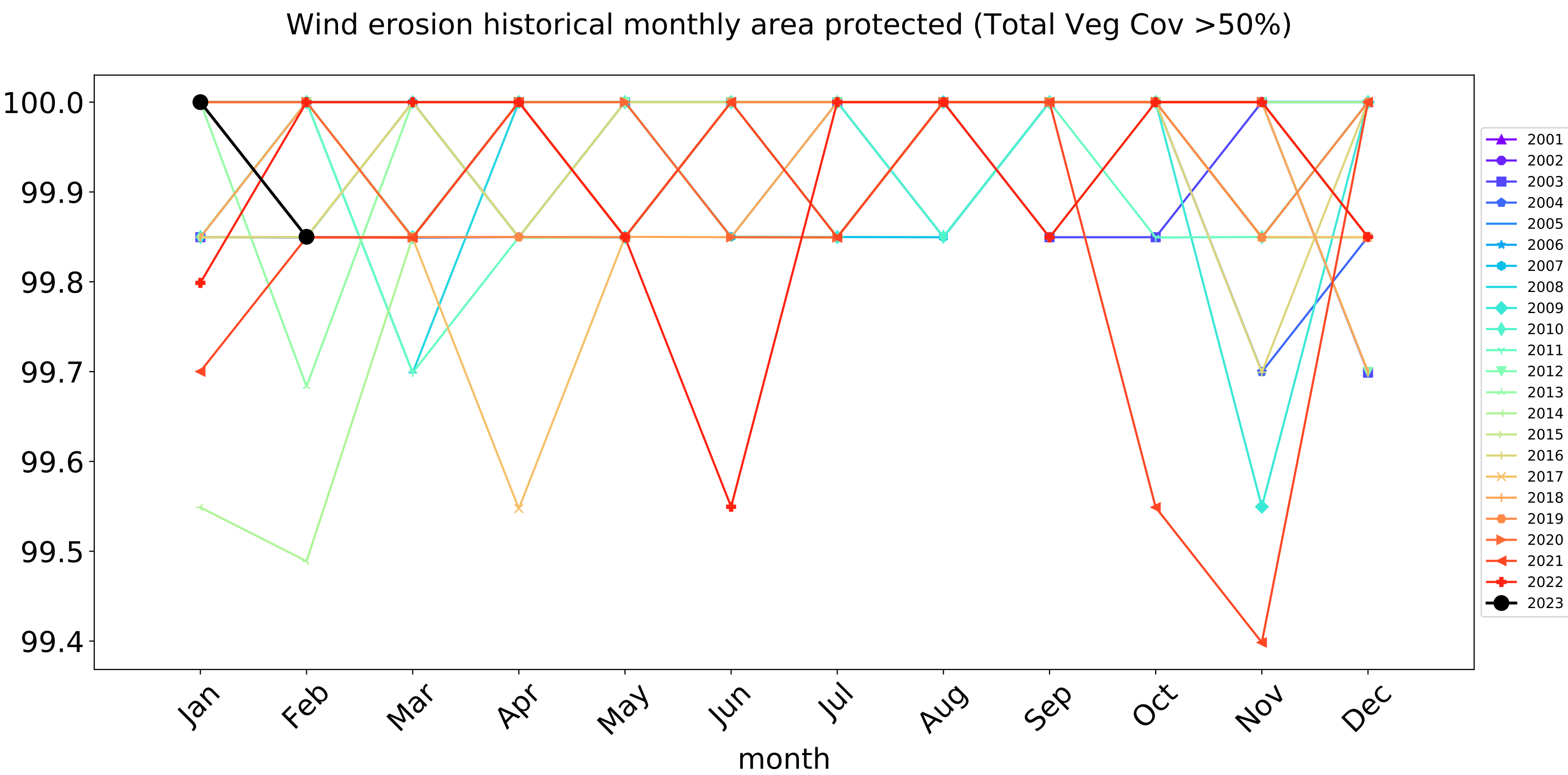
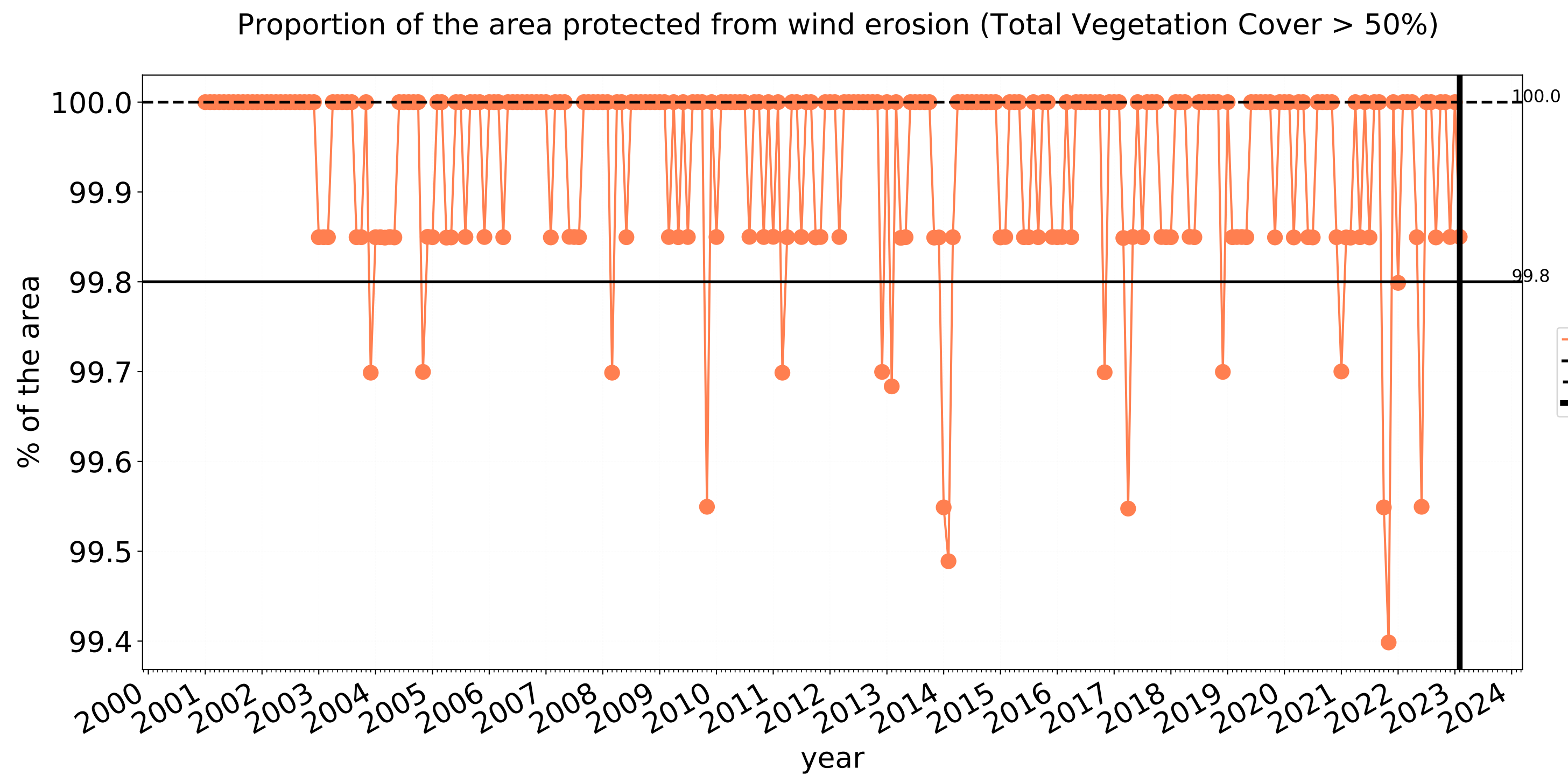


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Grazing non forest timeseries

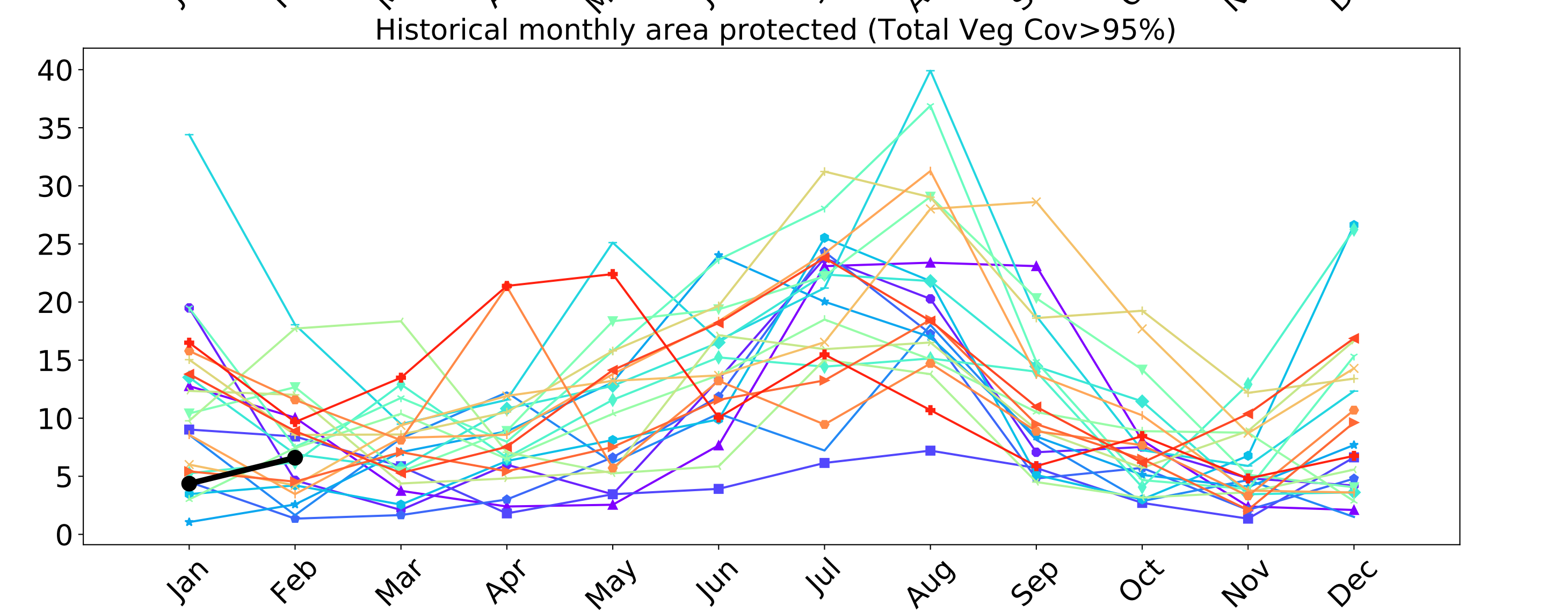
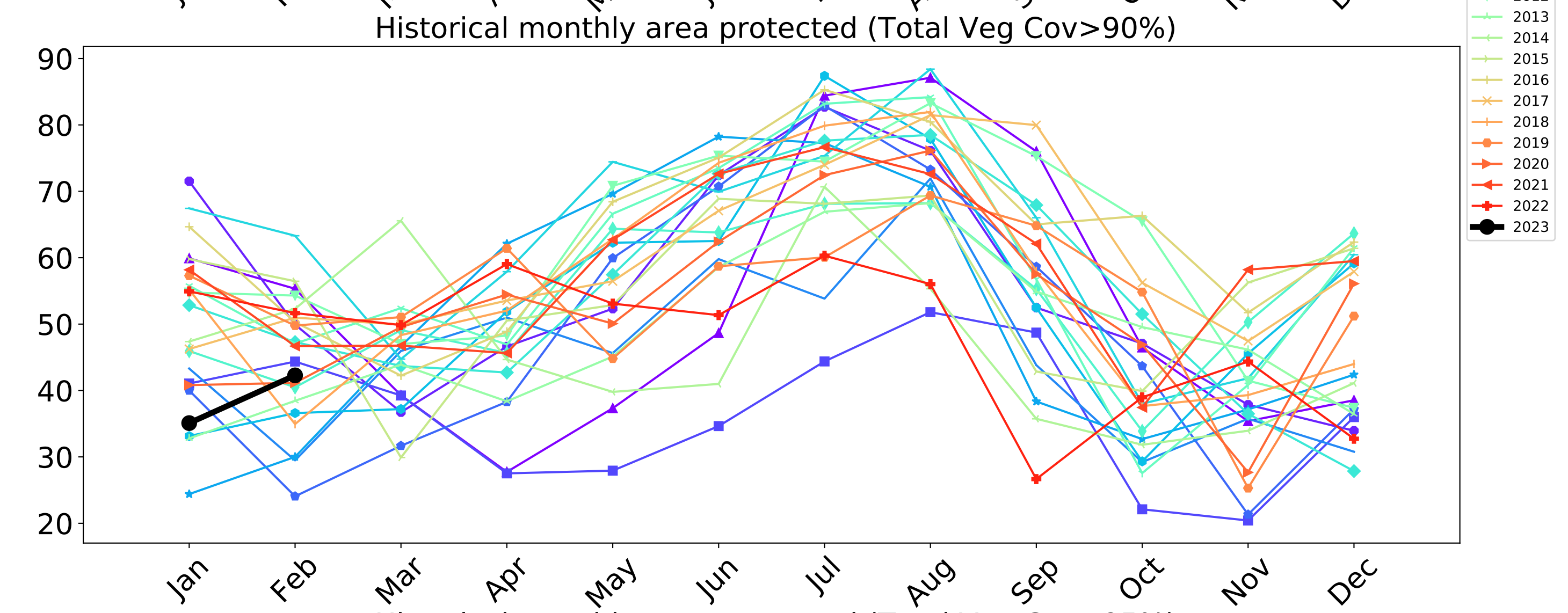
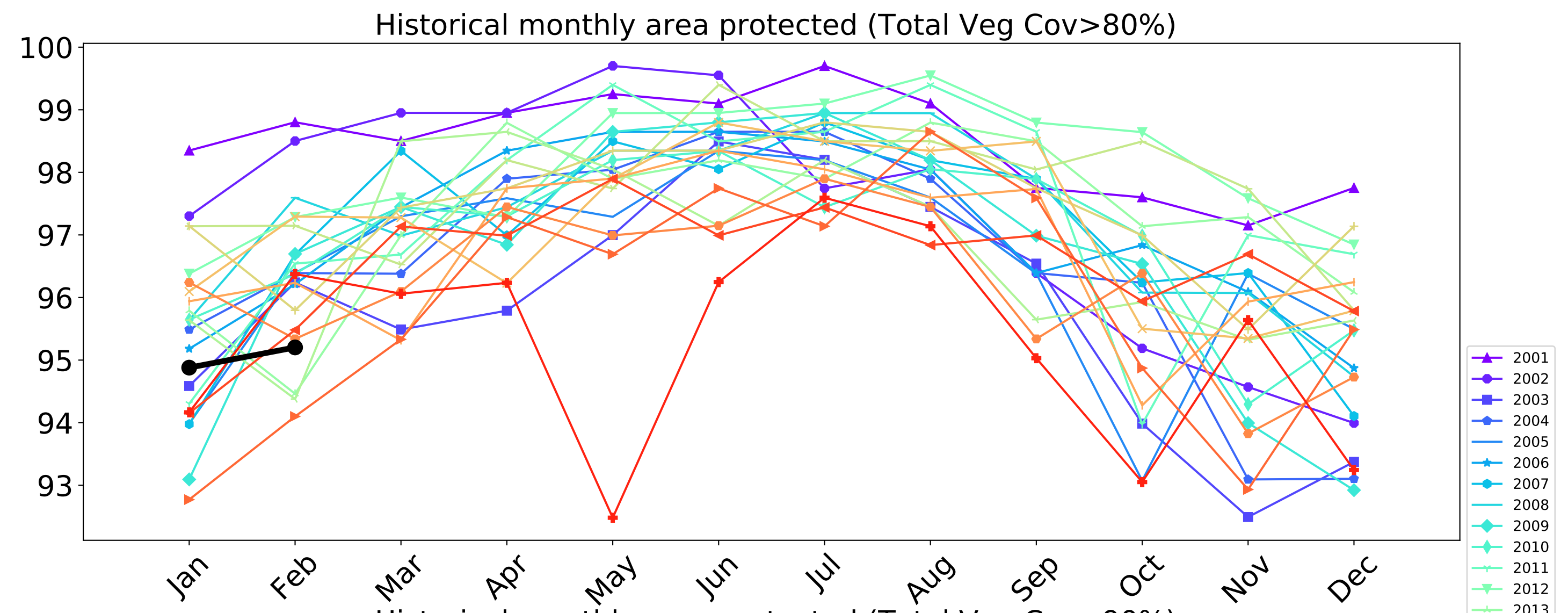
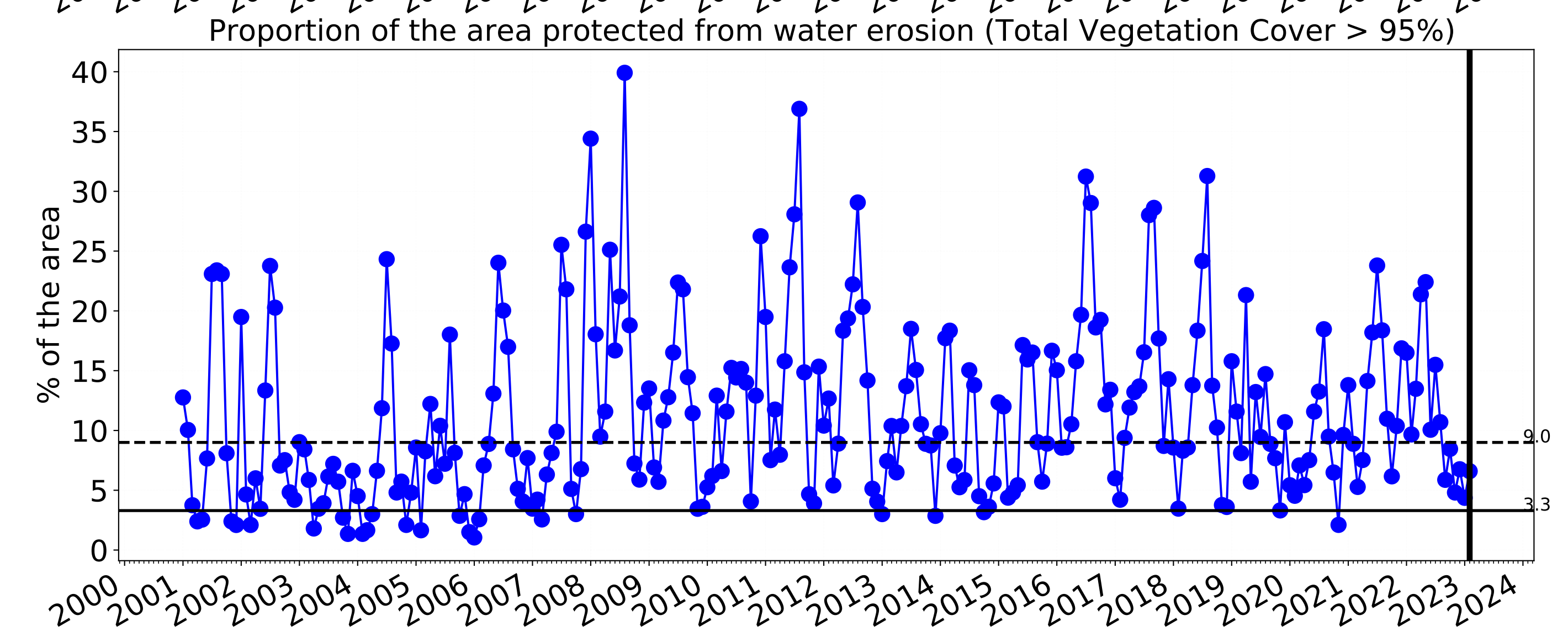
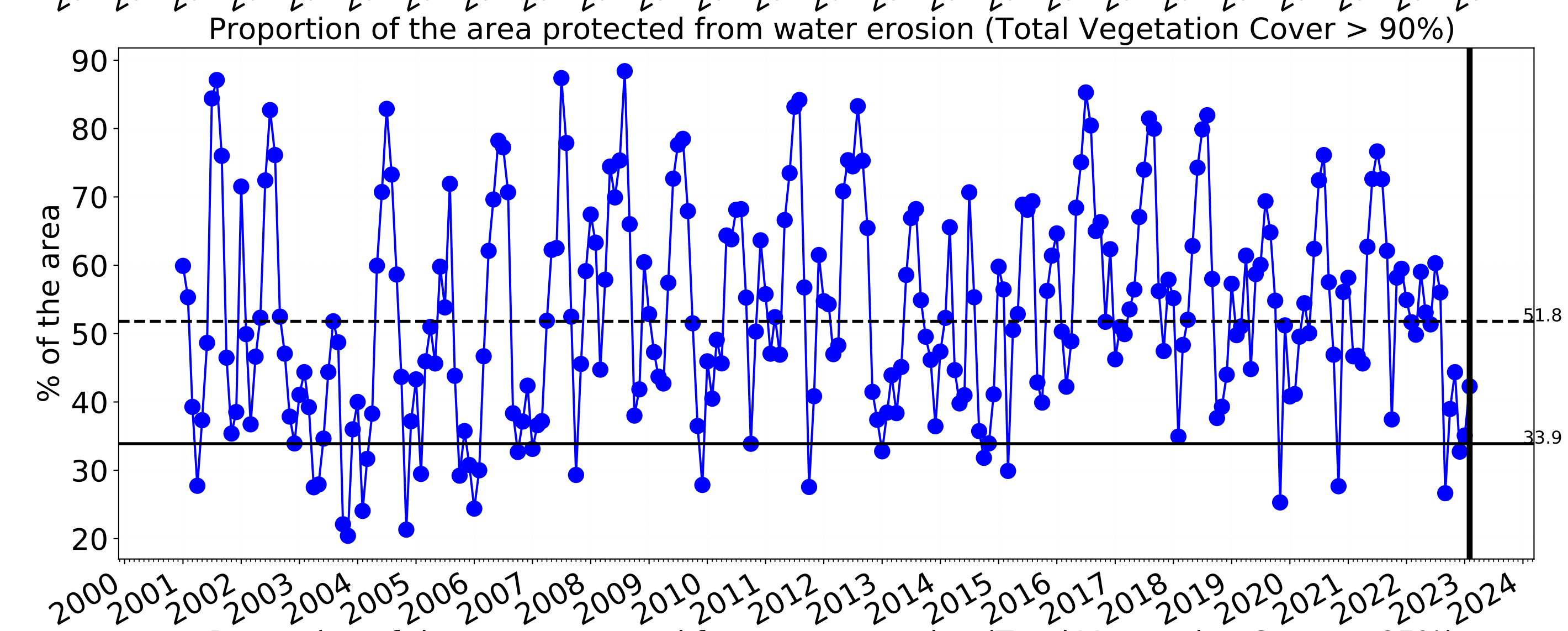
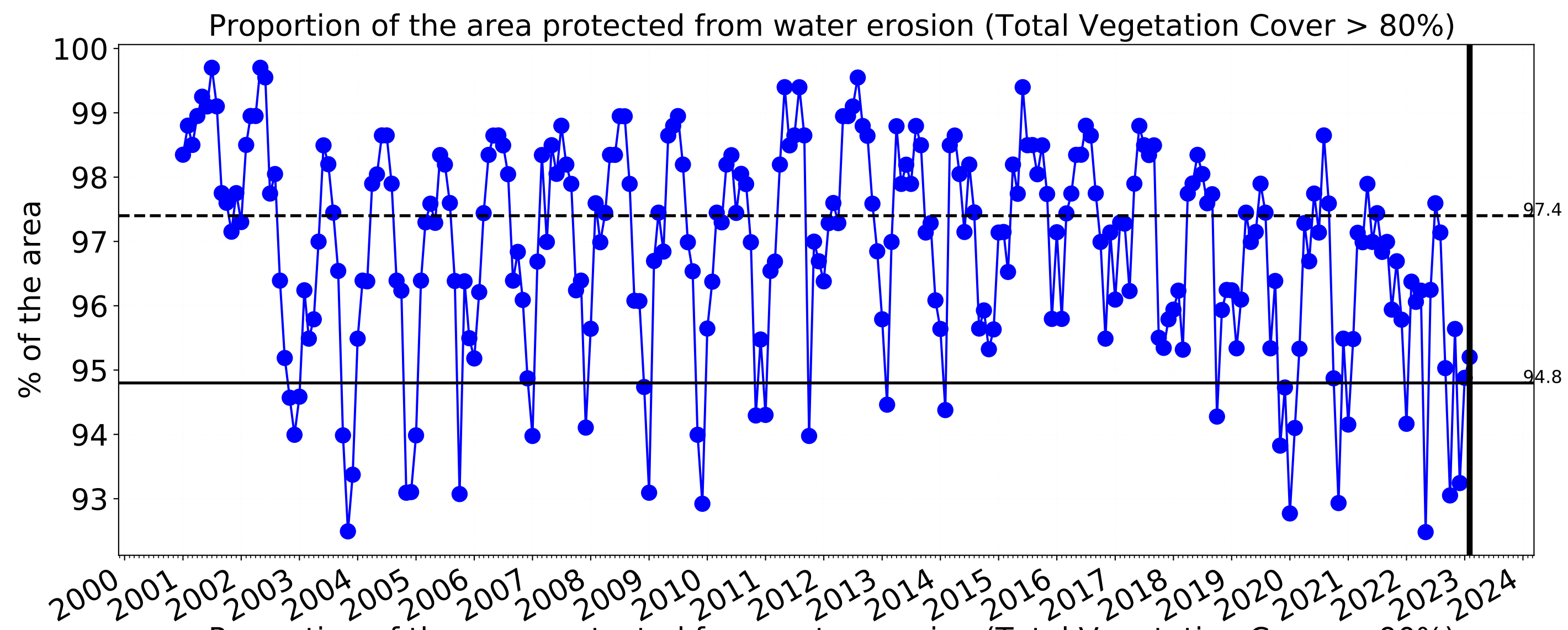


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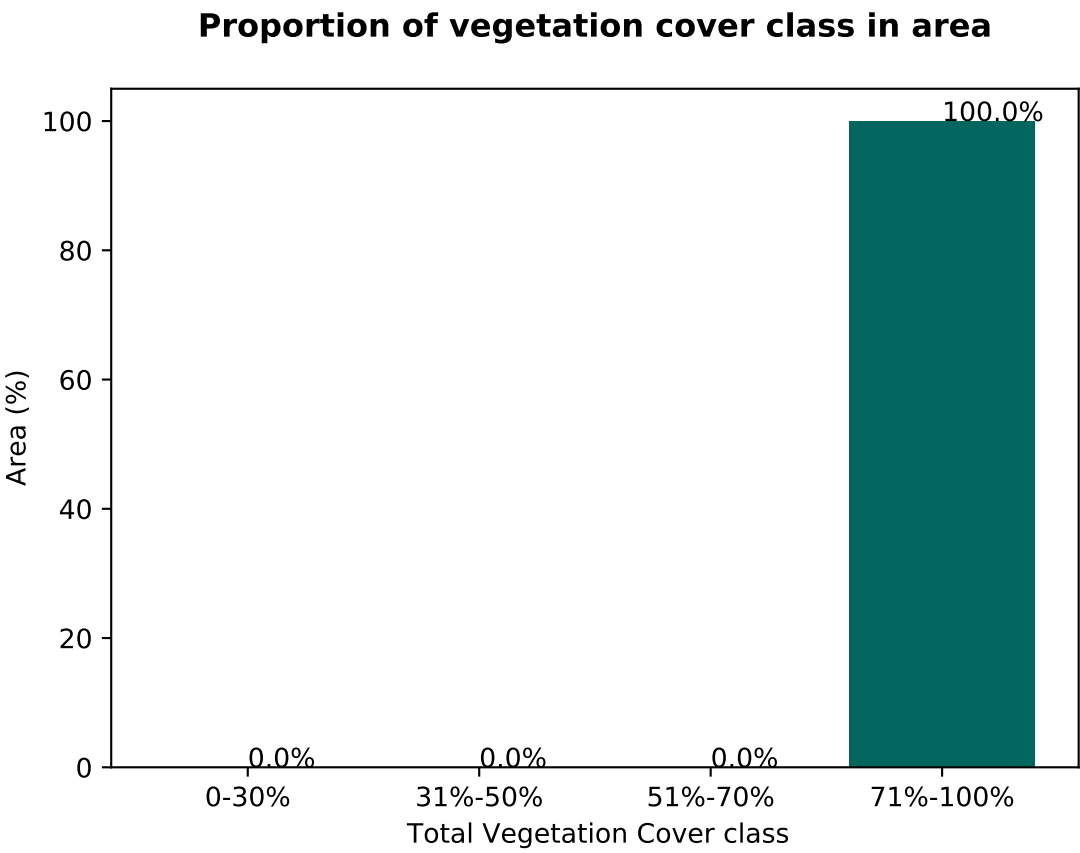
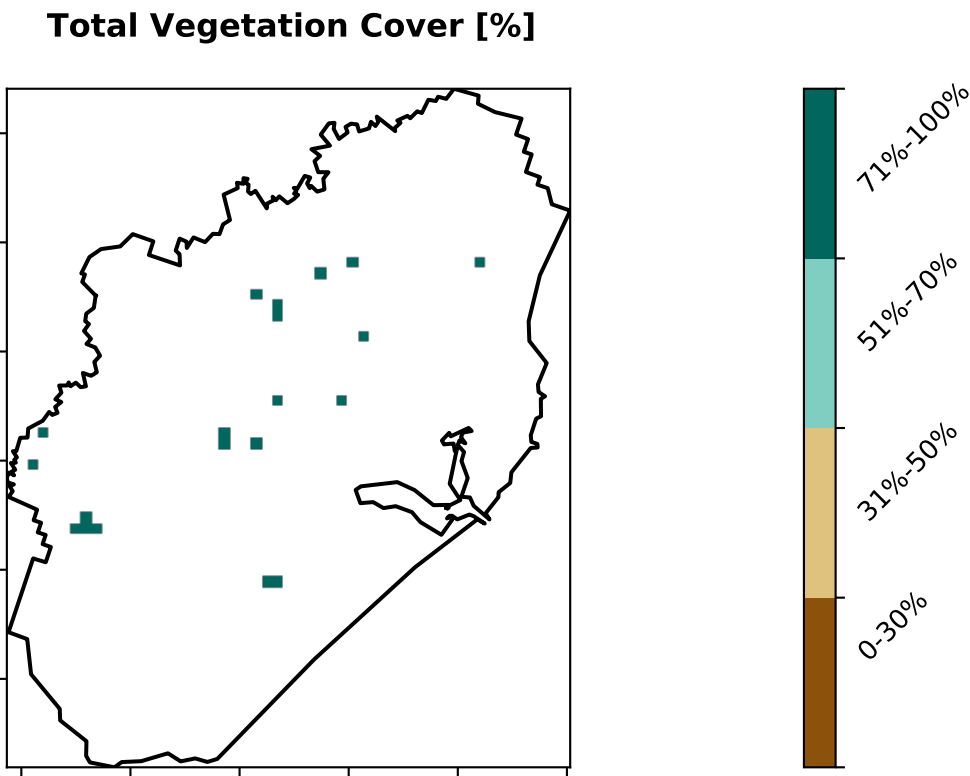
National
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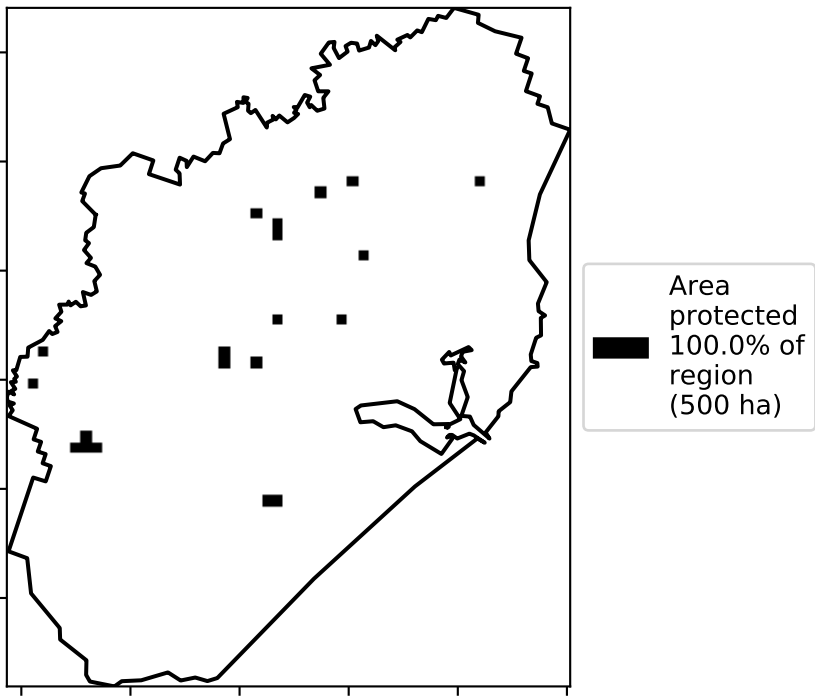


Grazing Woodland forest

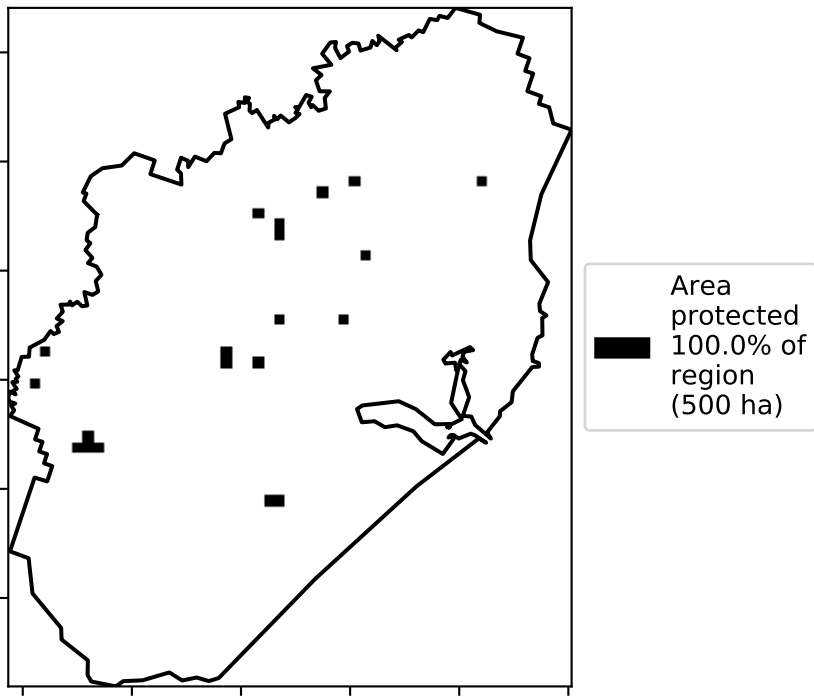
Catchment Scale
Land Use and Forests
of Australia (2018)
Derived from
Catchment Scale Land
Use of Australia
(2018) and Forests
of Australia (2018)



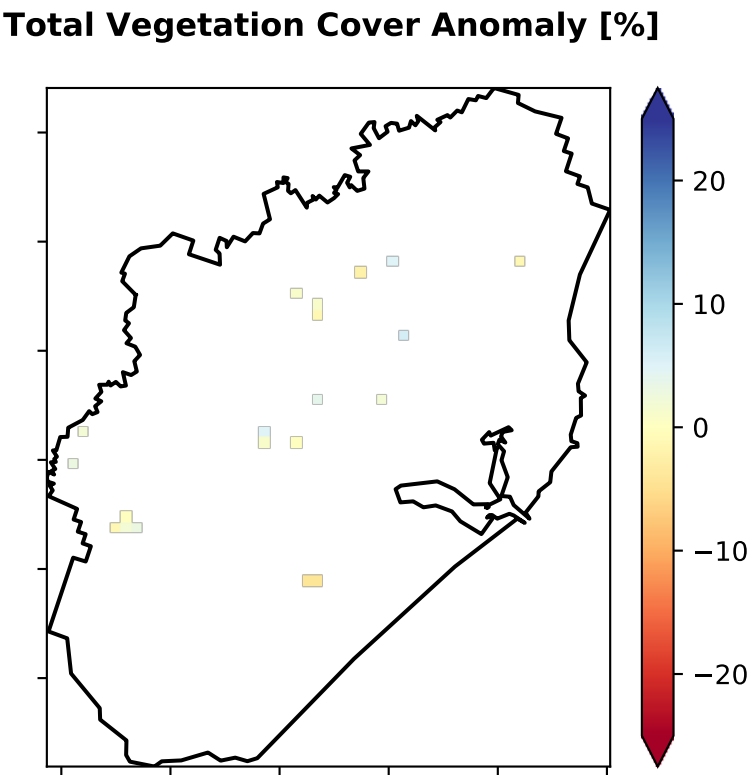
% Area protected from water erosion (>70%)



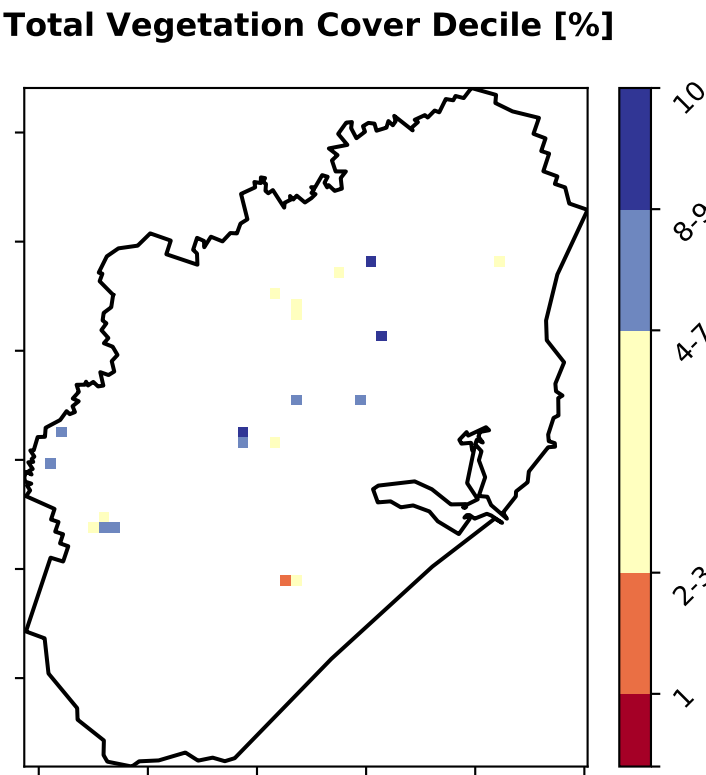
% Area protected from wind erosion (>50%)



Anomaly show how
many percentage
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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
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That is, red pixels are
in the lowest 10% of
records for that month of
the map using baseline
from 2001 to 2019.



tern

Ecosystem Research Infrastructure

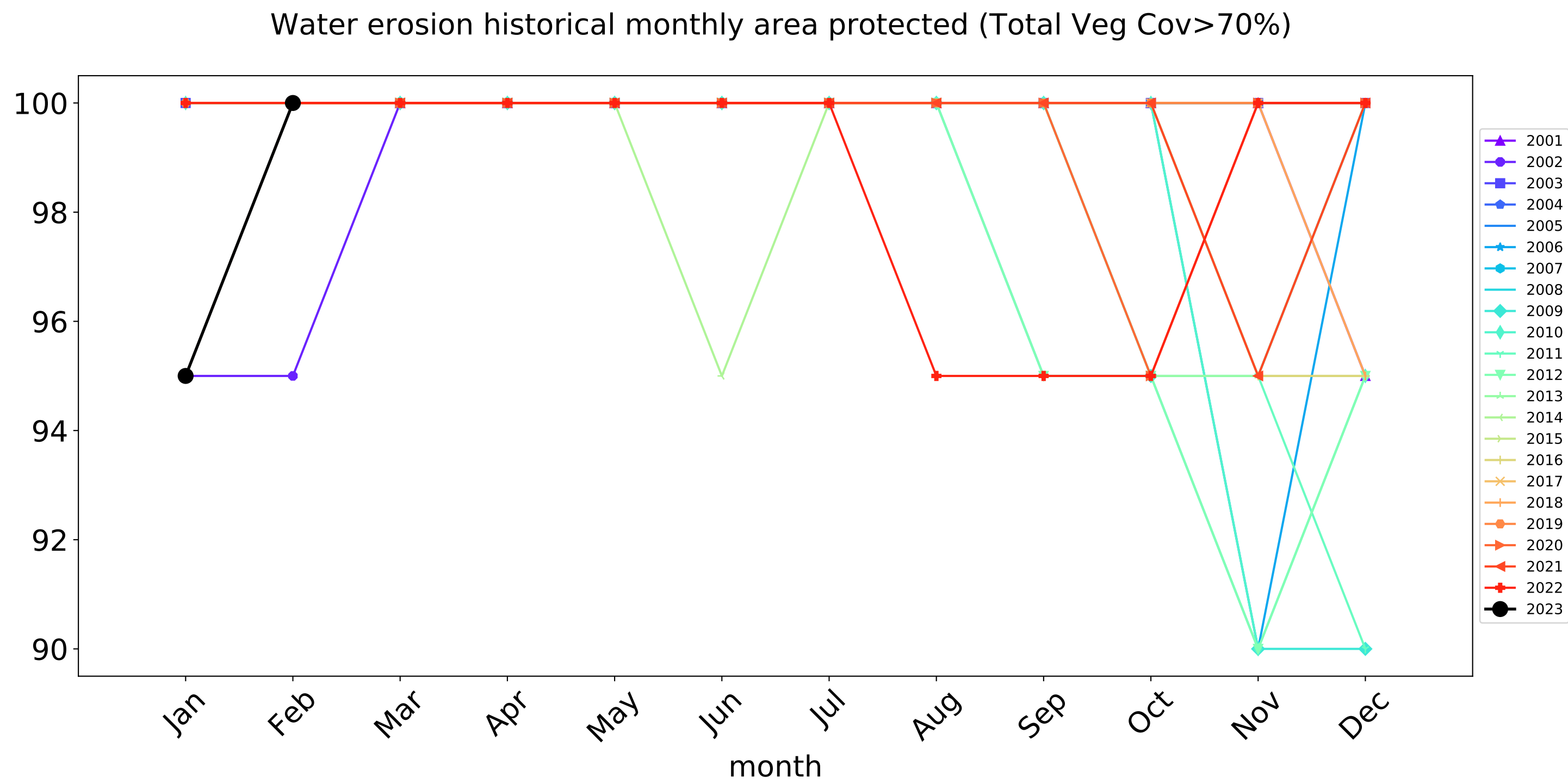
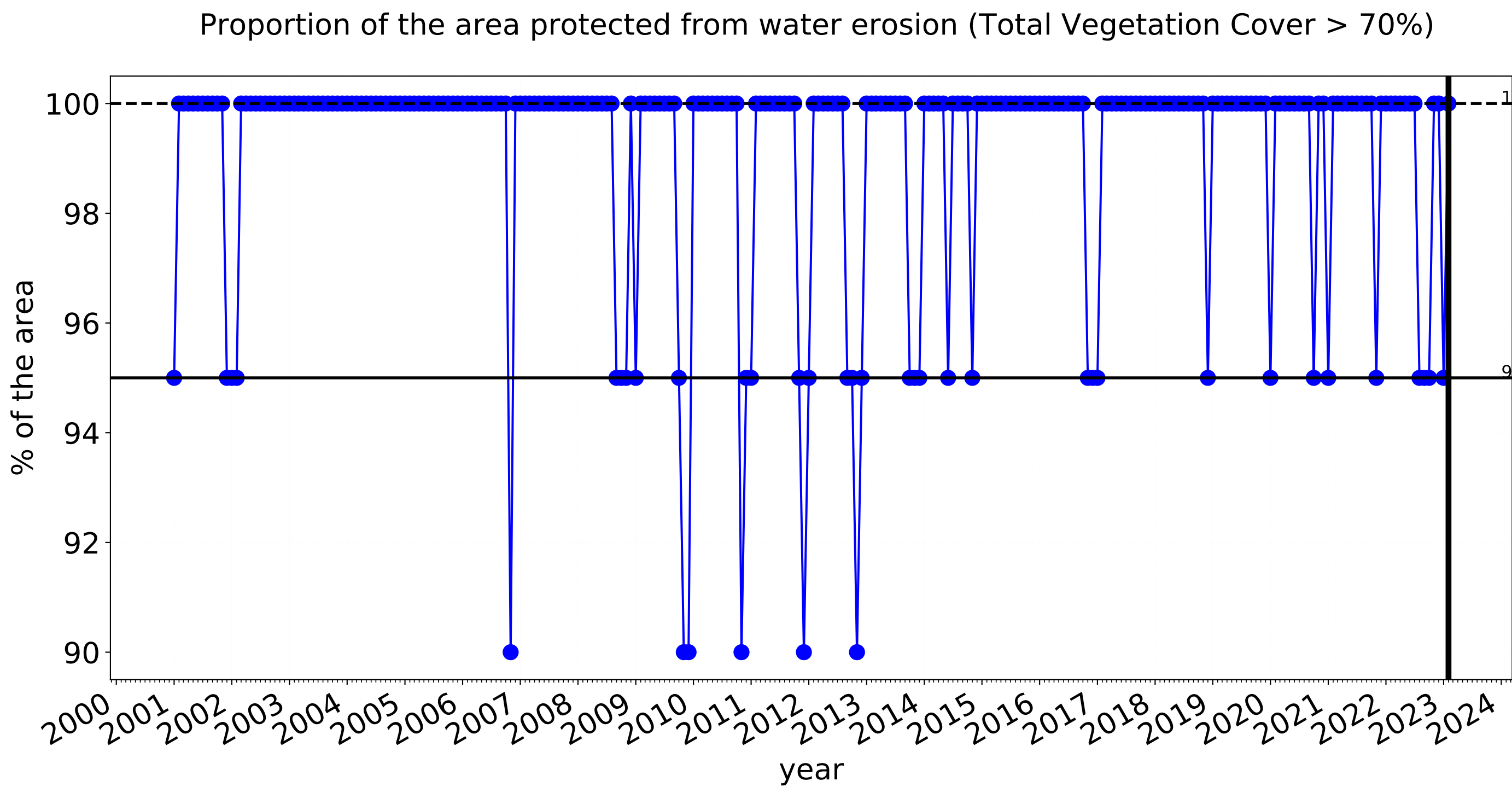
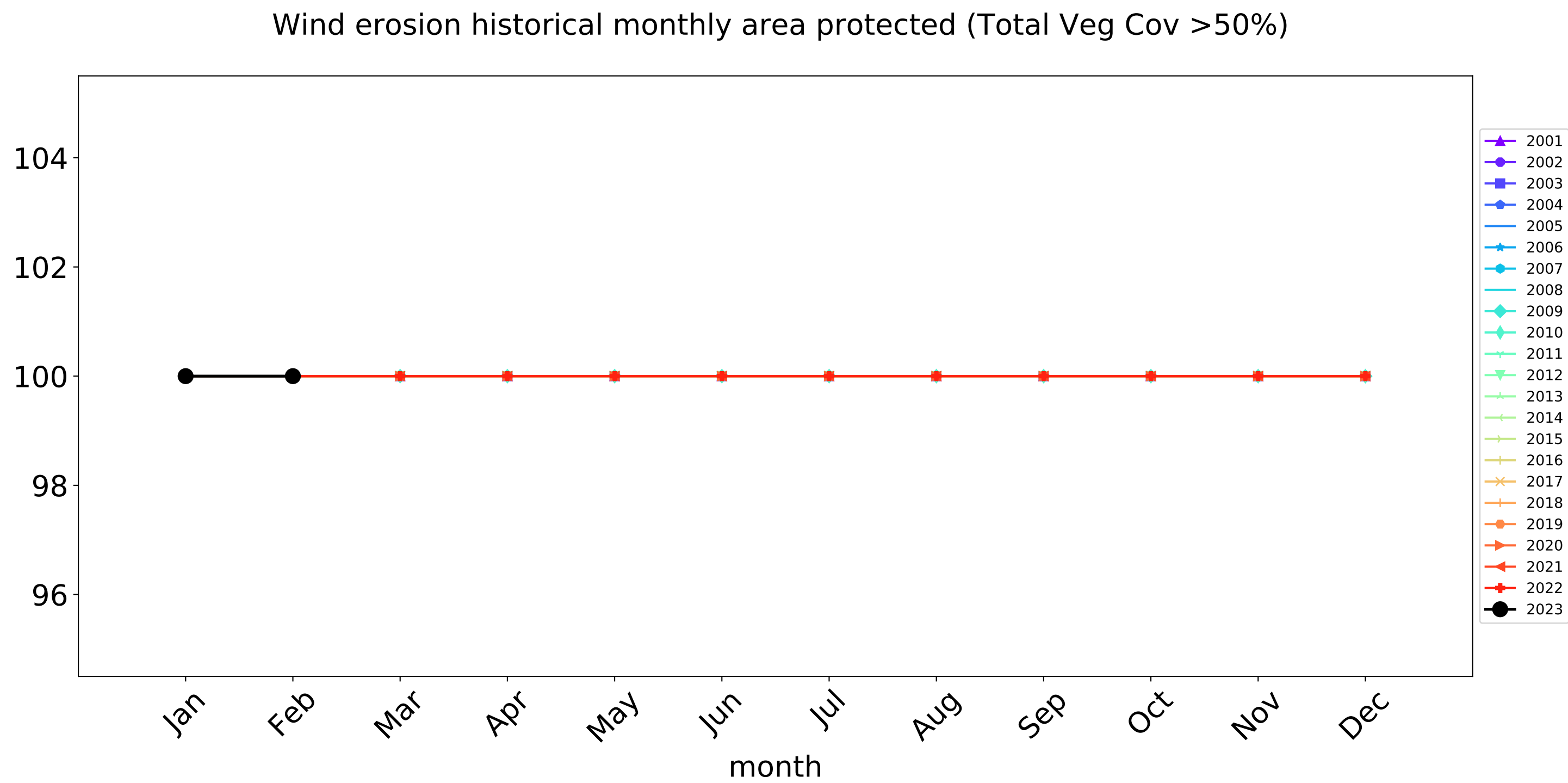
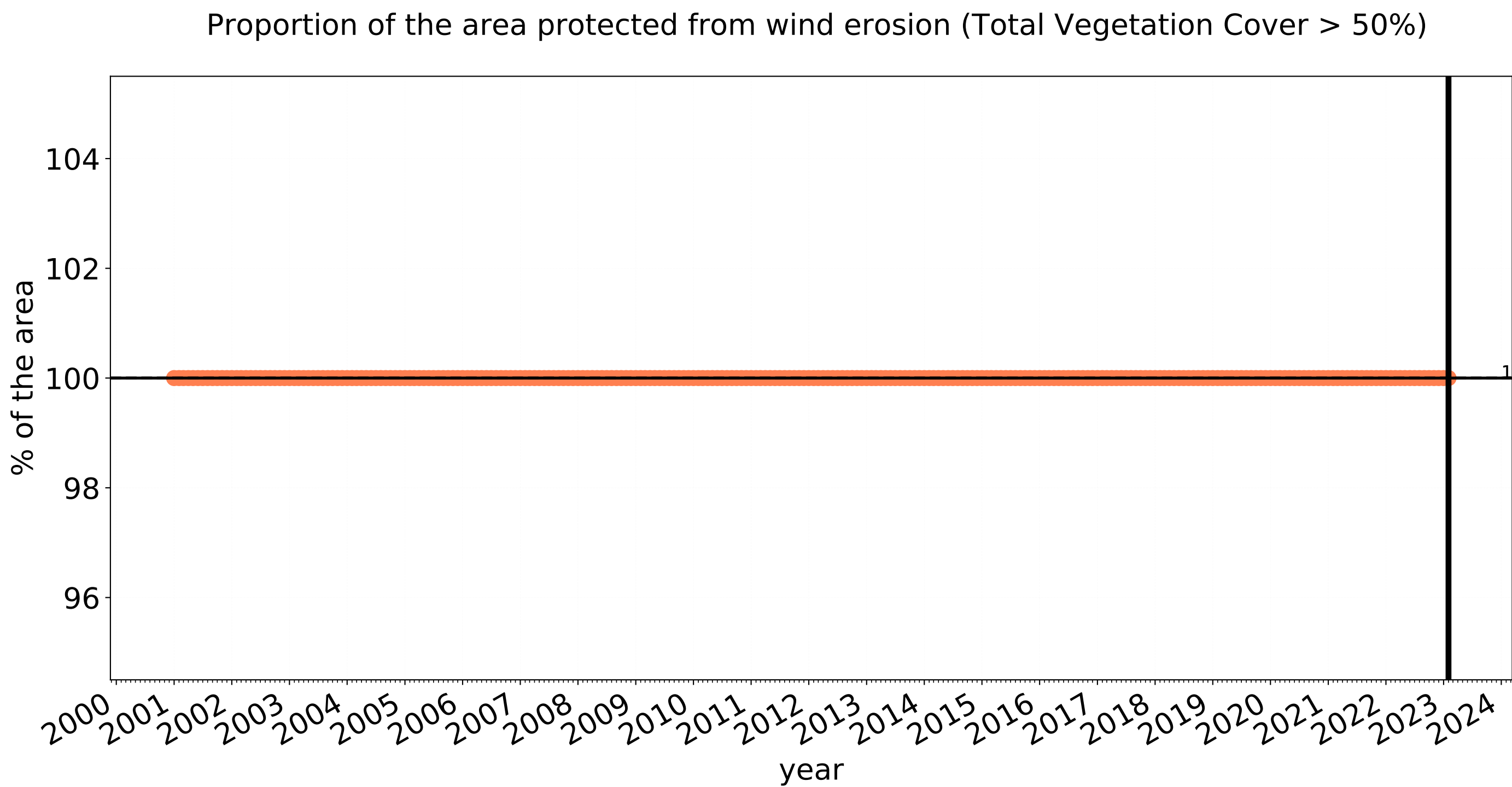


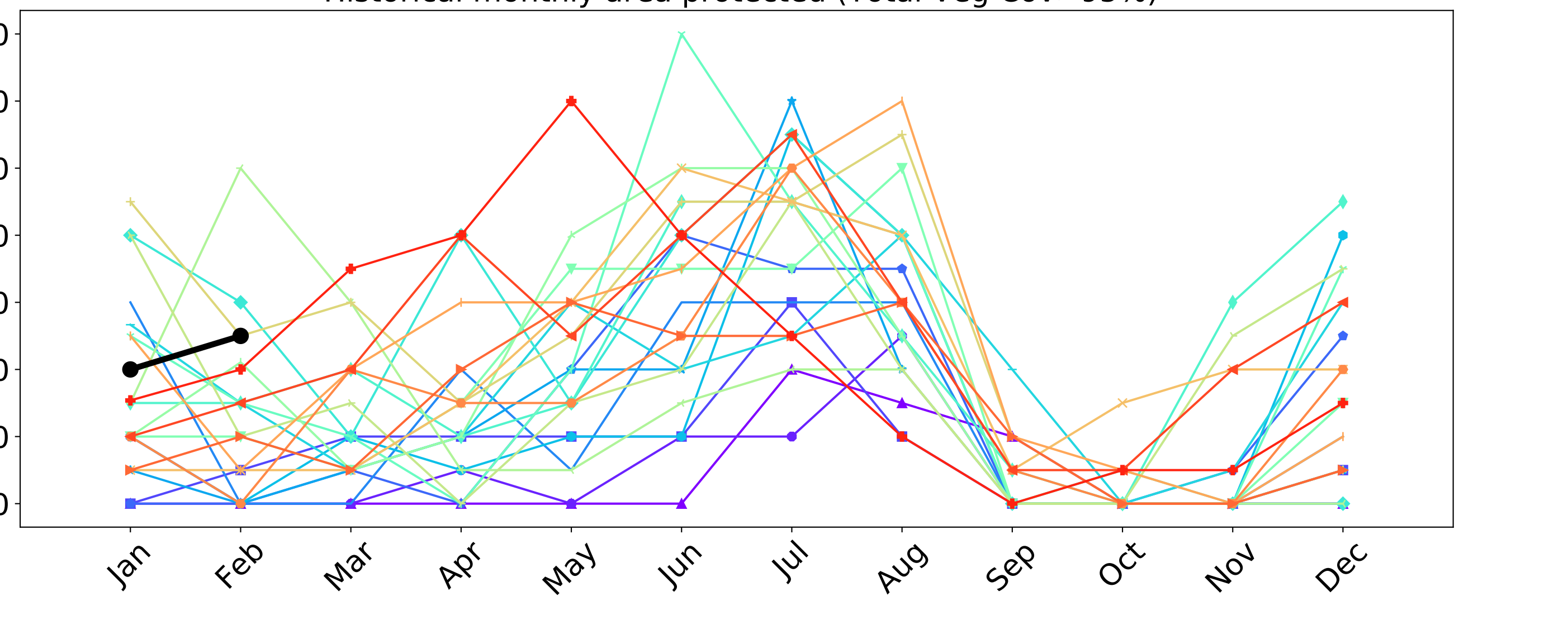
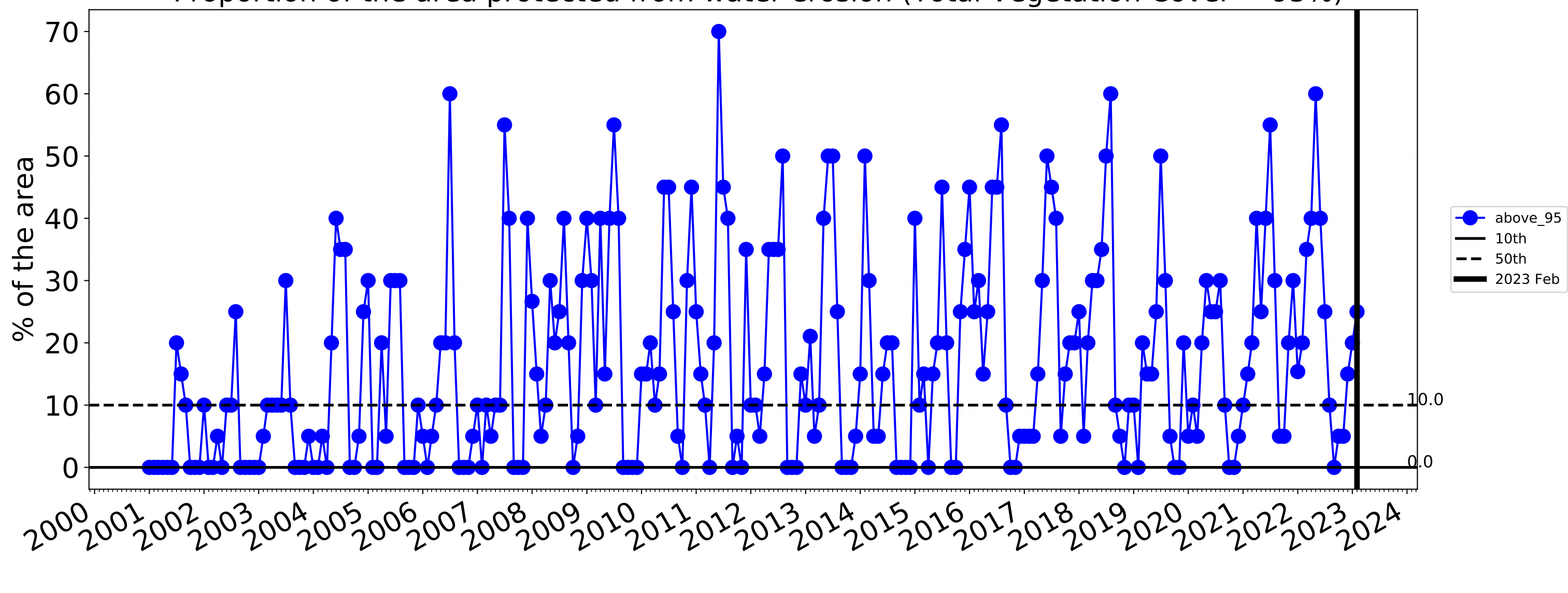
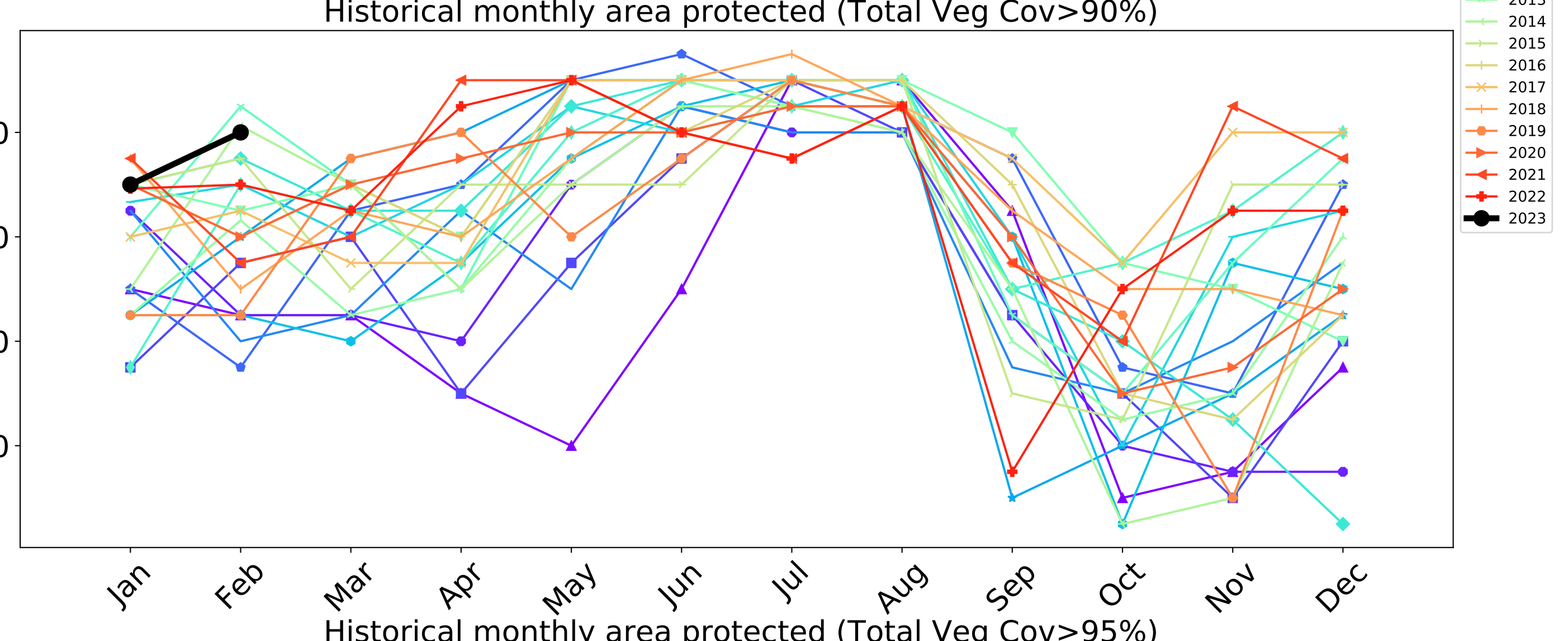
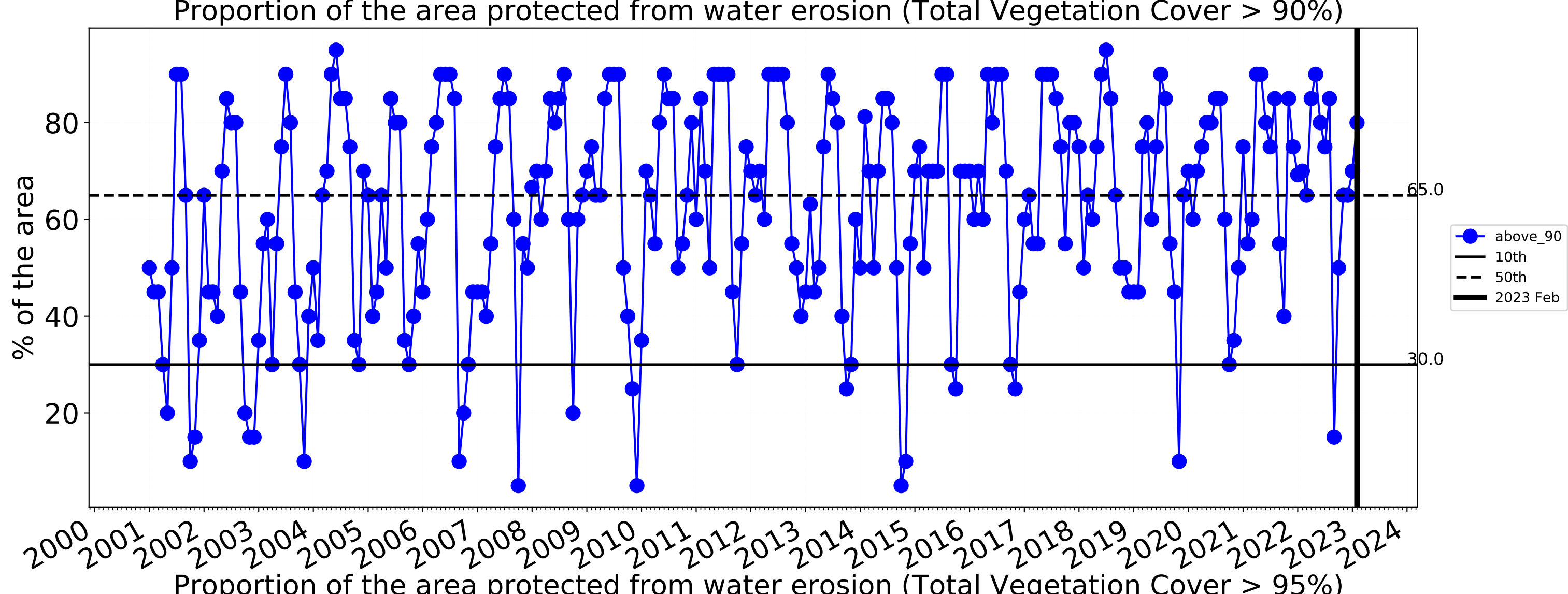
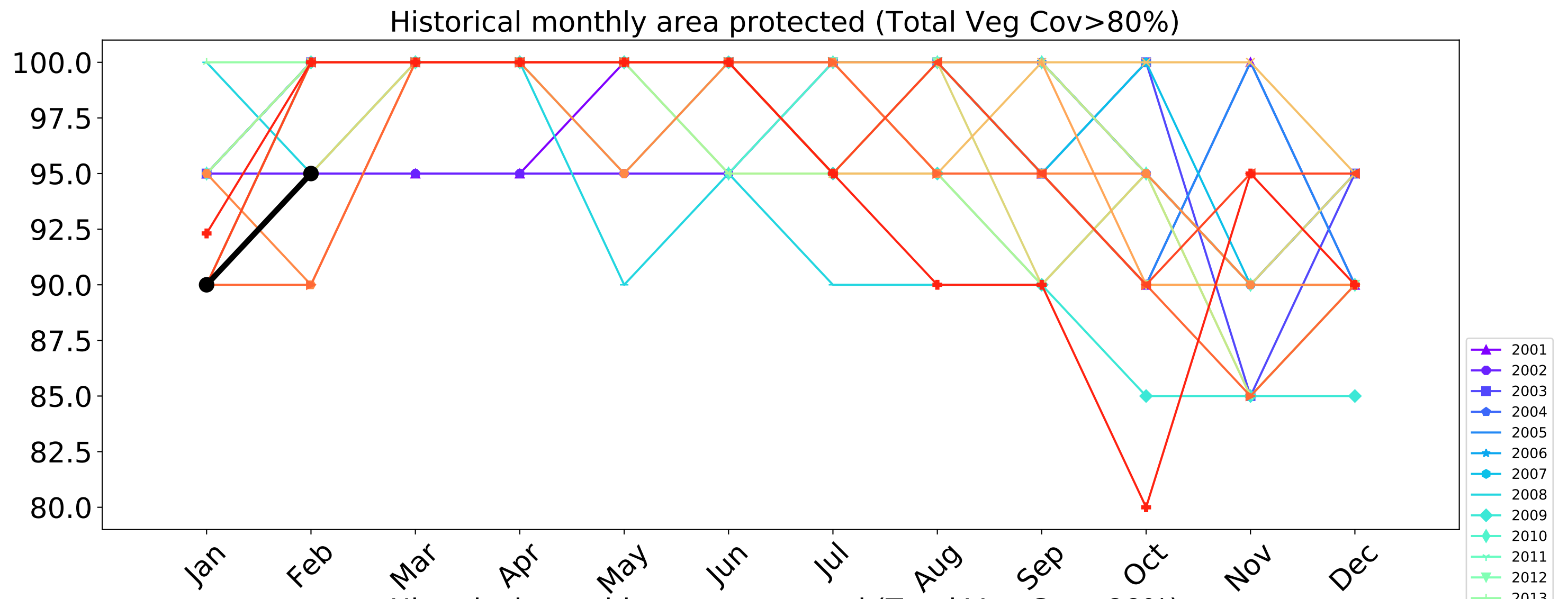
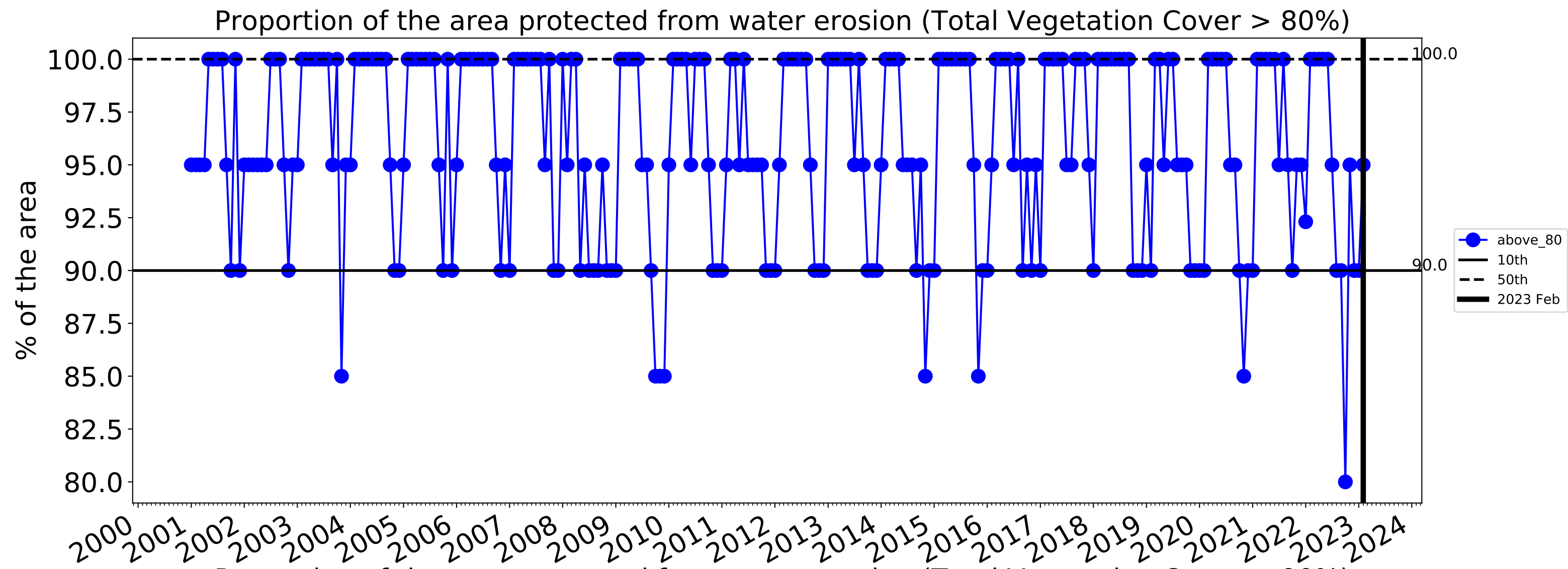
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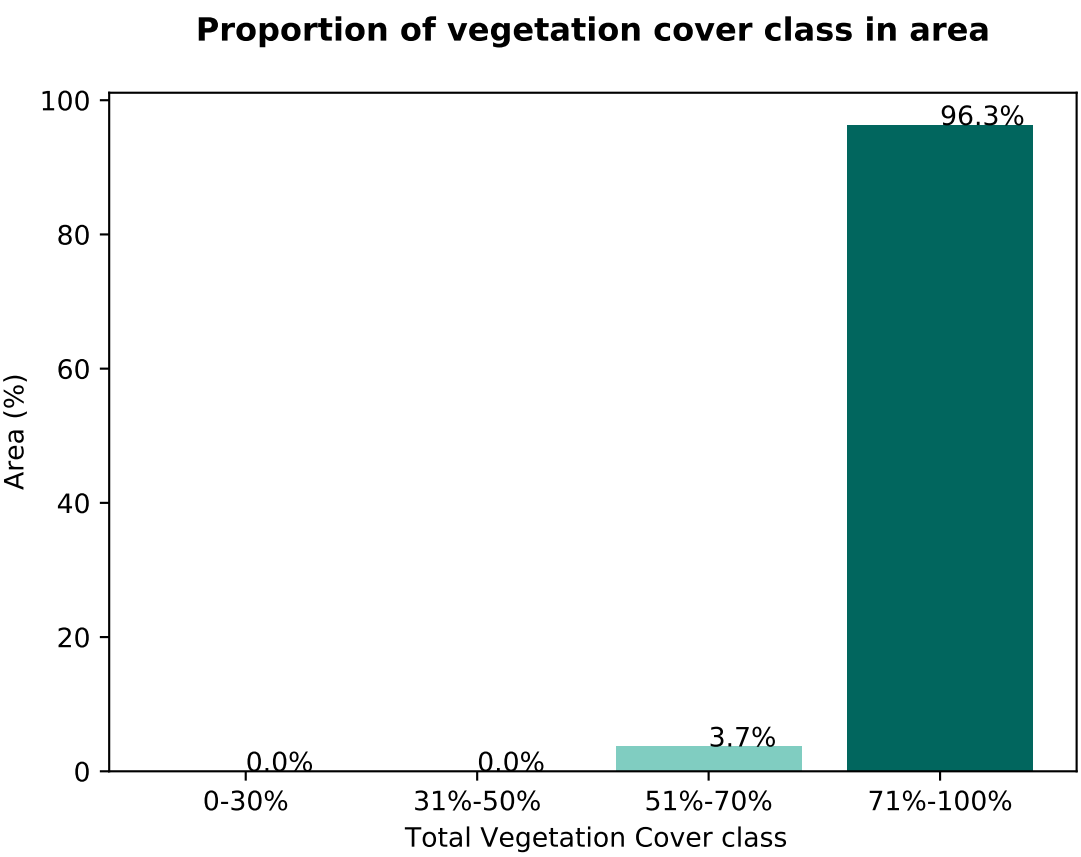
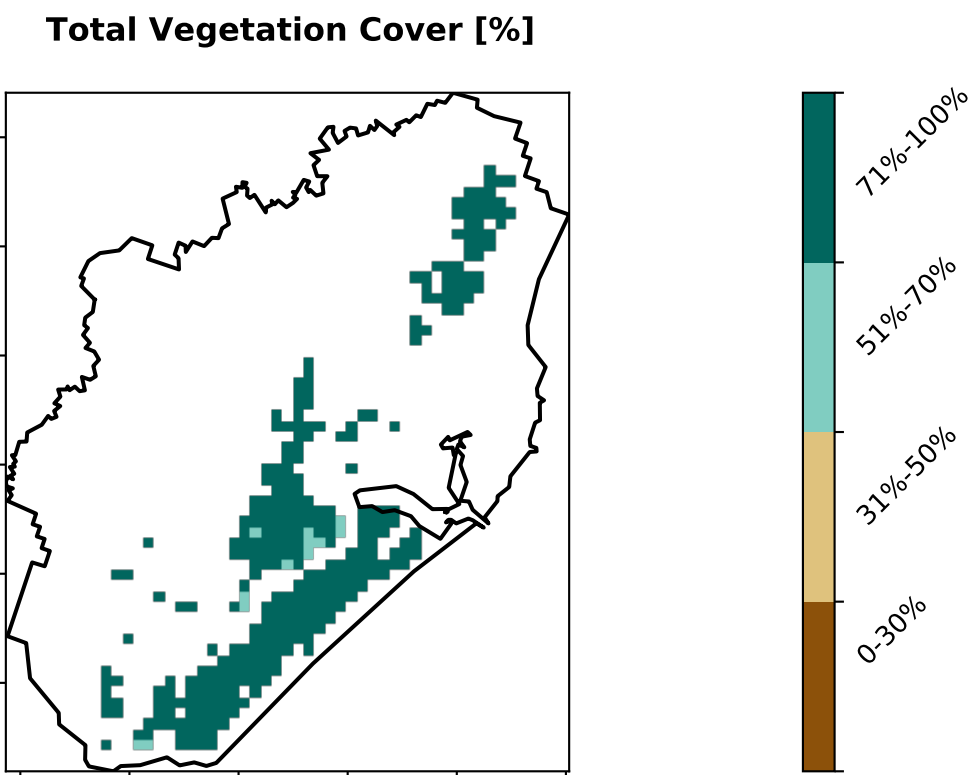
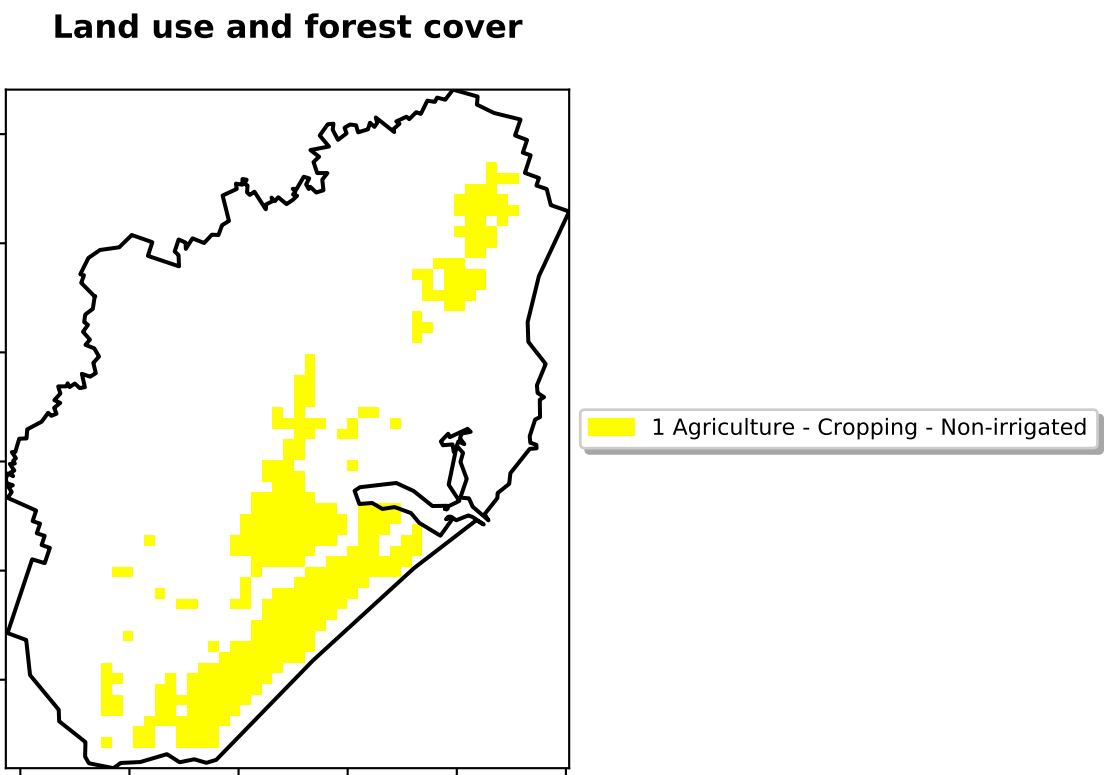
Grazing Woodland forest timeseries



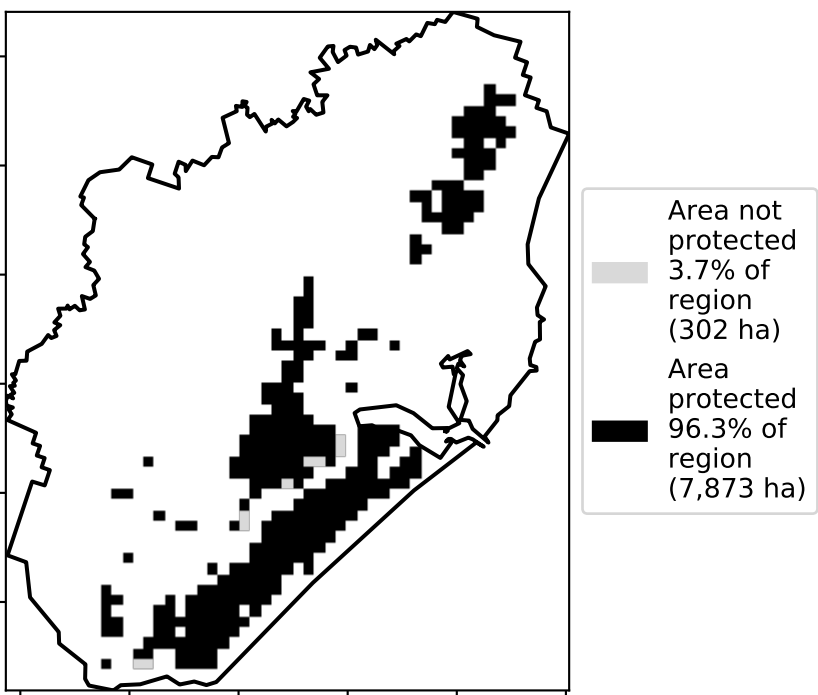


Cropping

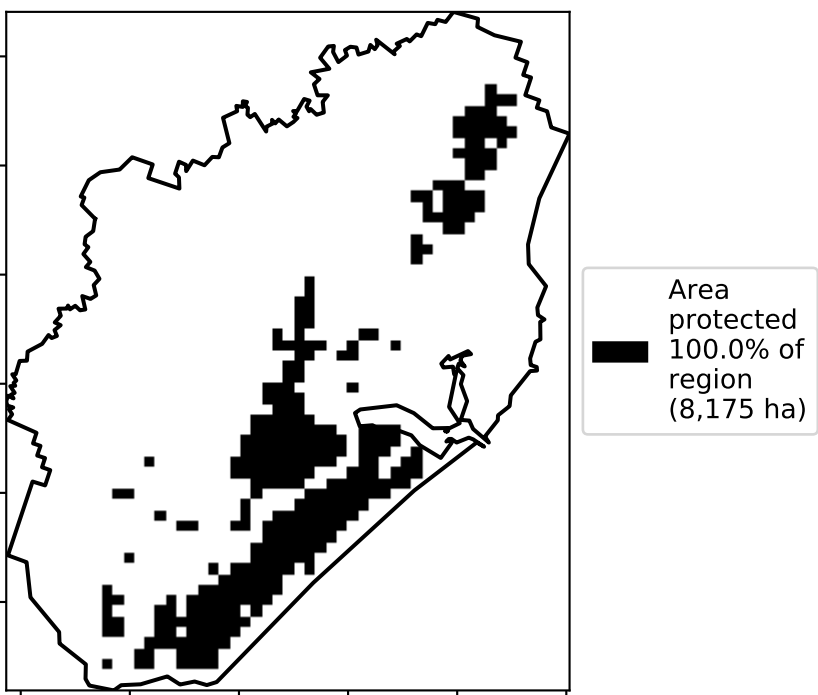
Catchment Scale
Land Use and Forests
of Australia (2018)
Derived from
Catchment Scale Land
Use of Australia
(2018) and Forests
of Australia (2018)



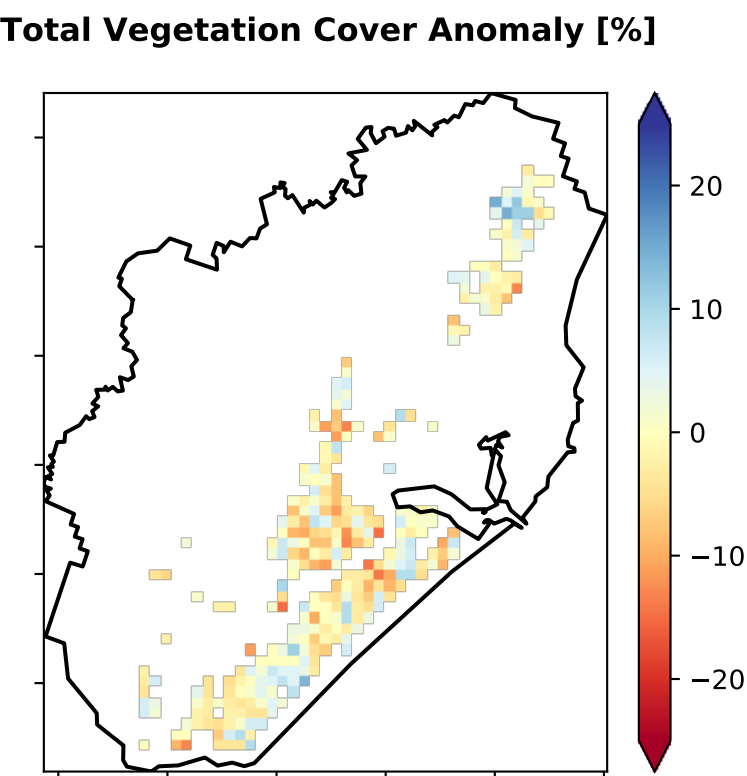
% Area protected from water erosion (>70%)



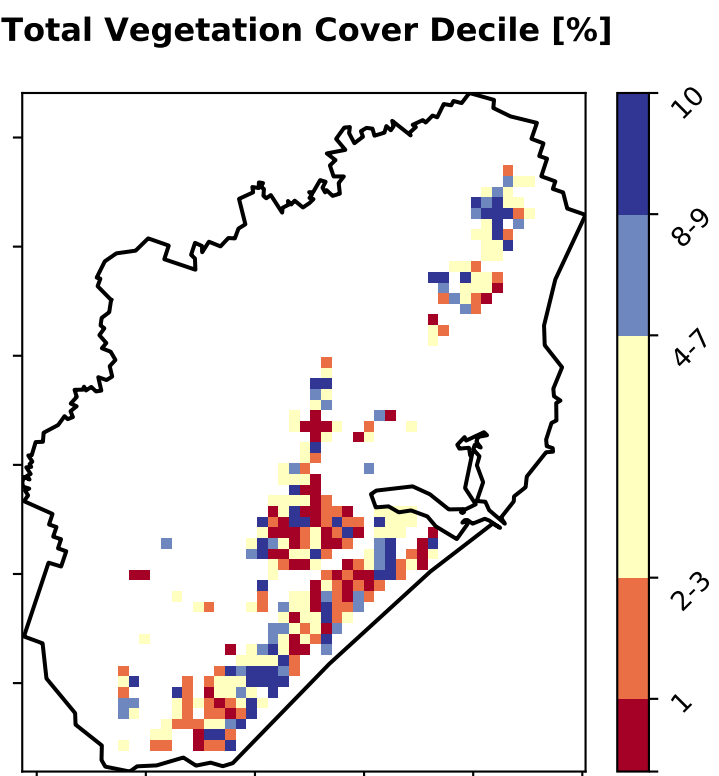
% Area protected from wind erosion (>50%)



Anomaly show how many percentage 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.



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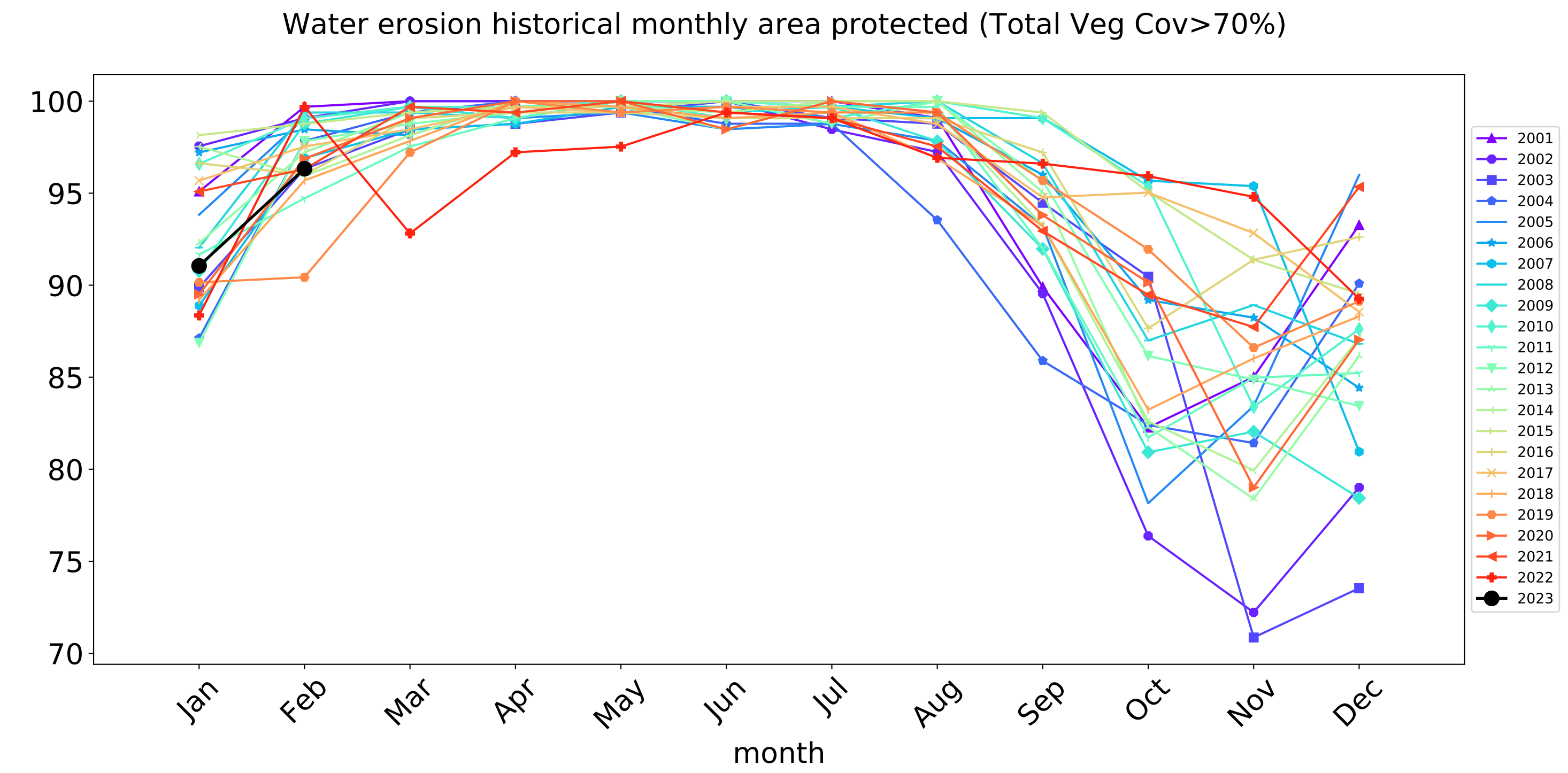
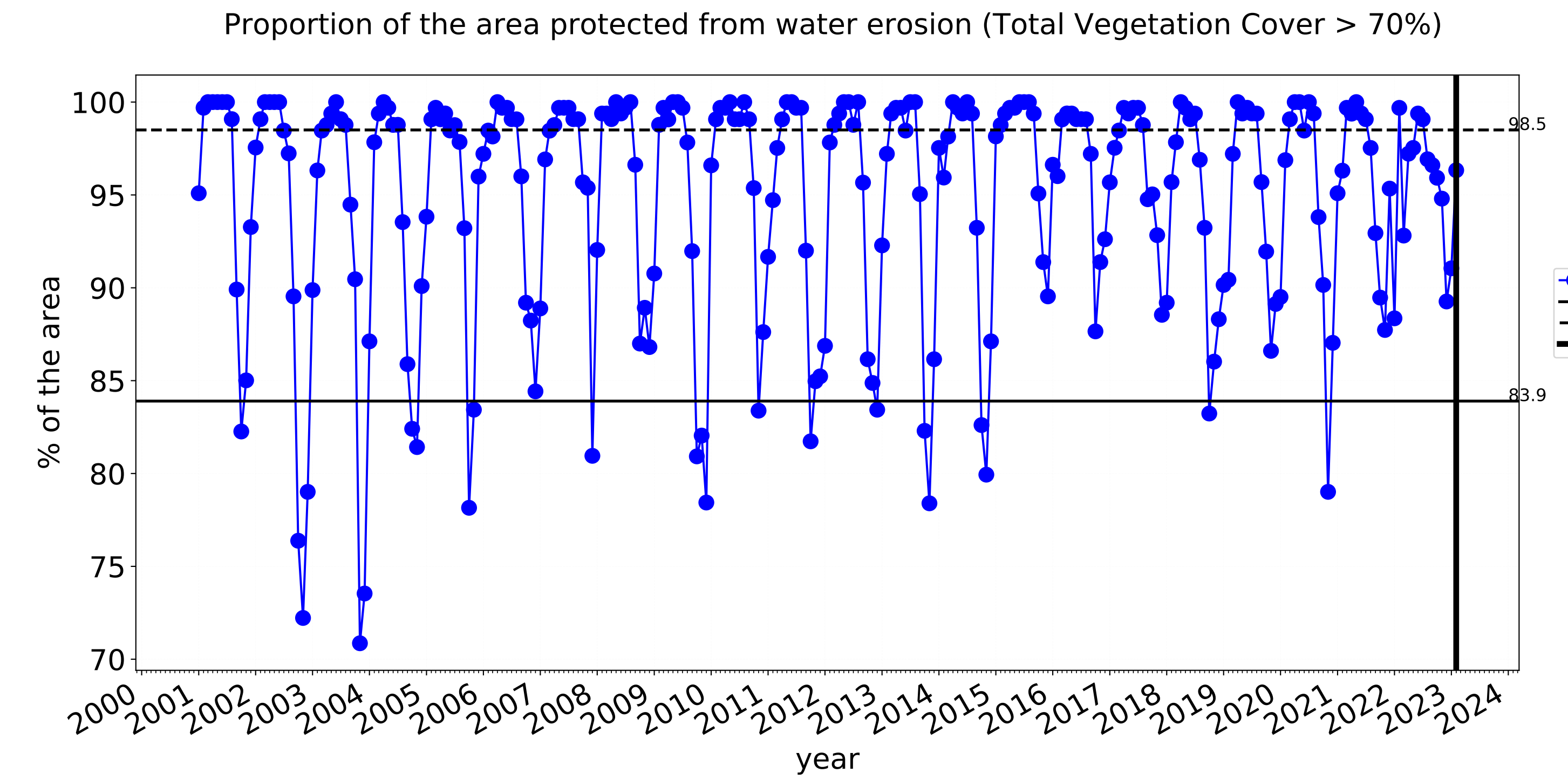
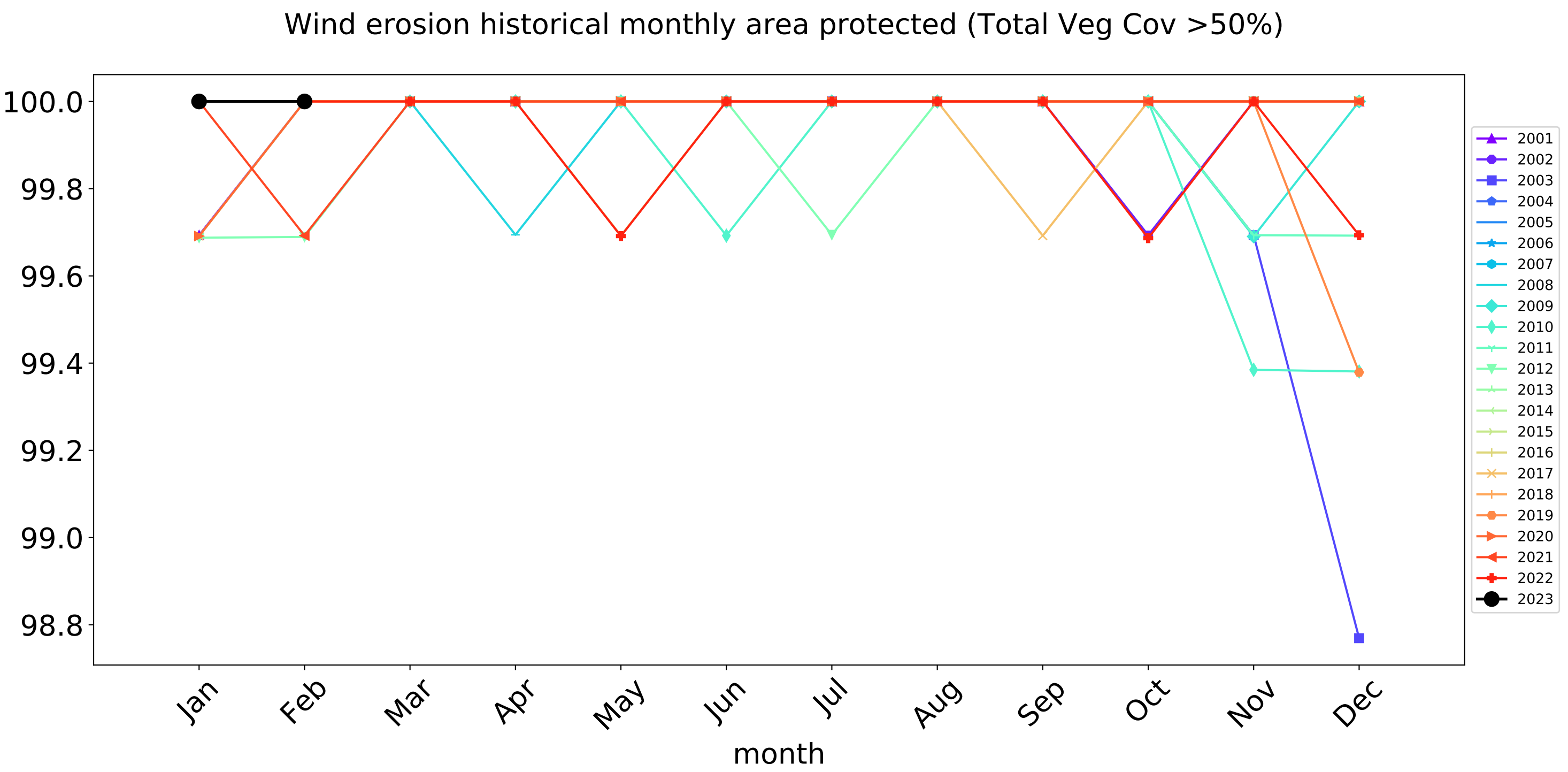
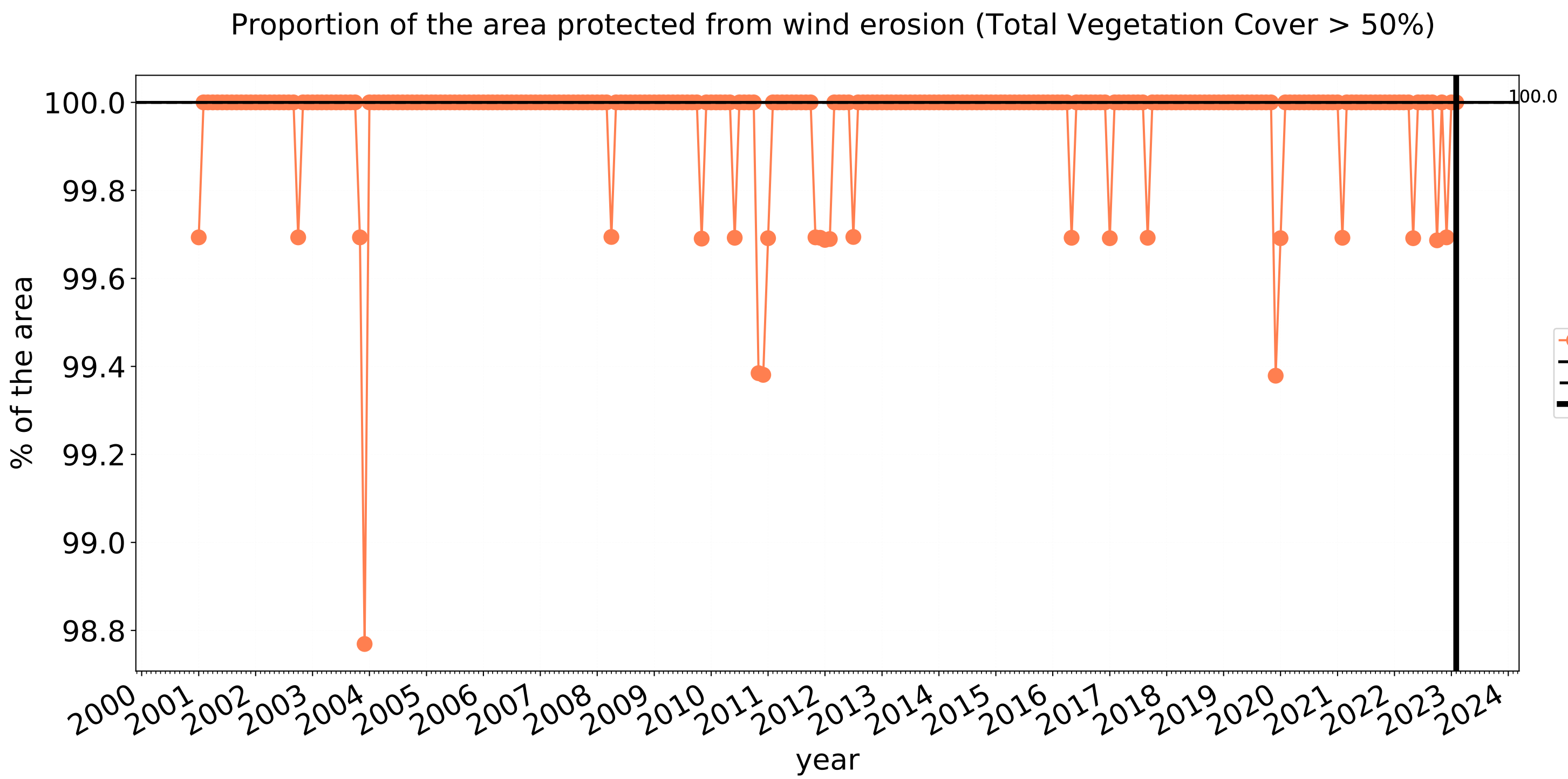


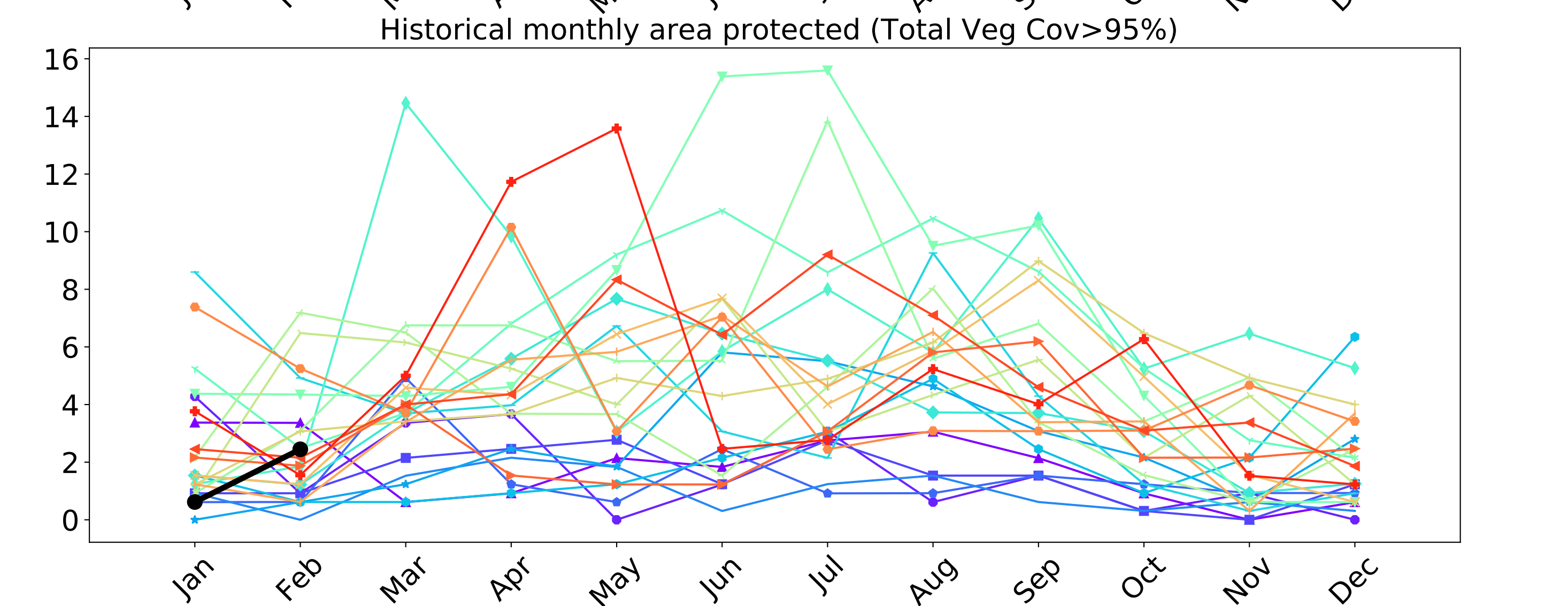
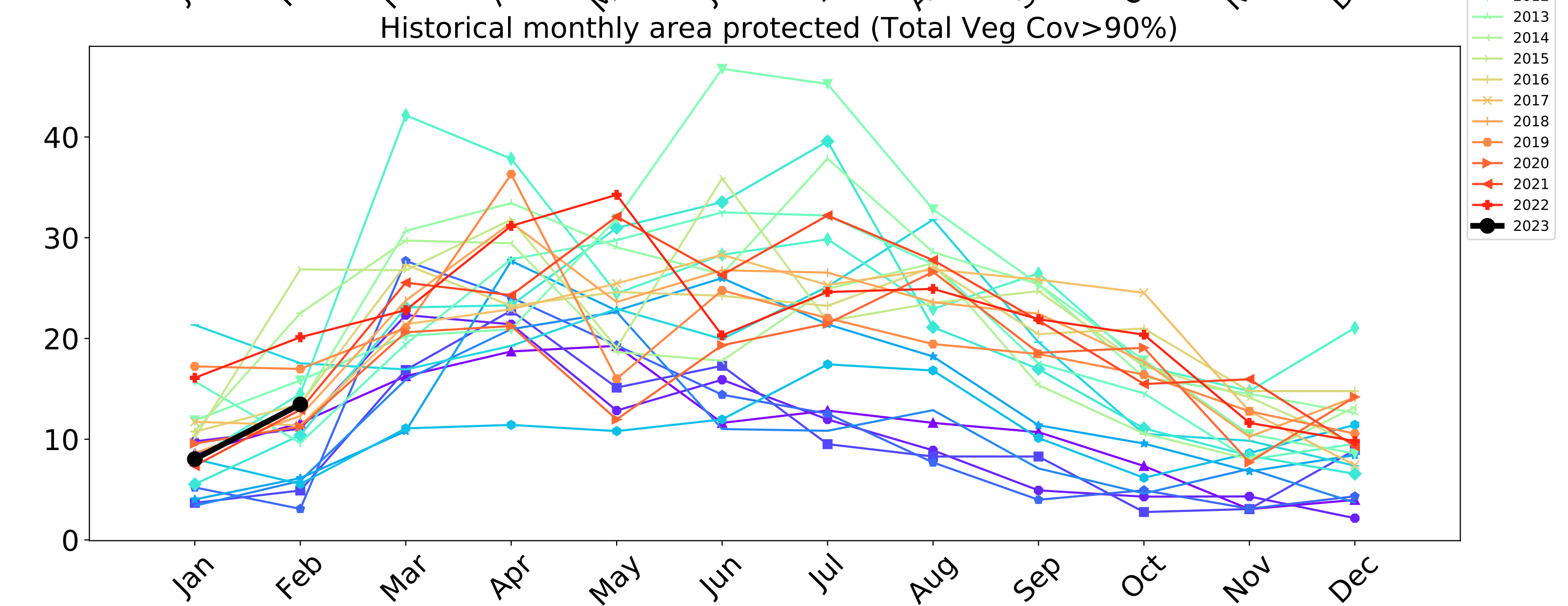
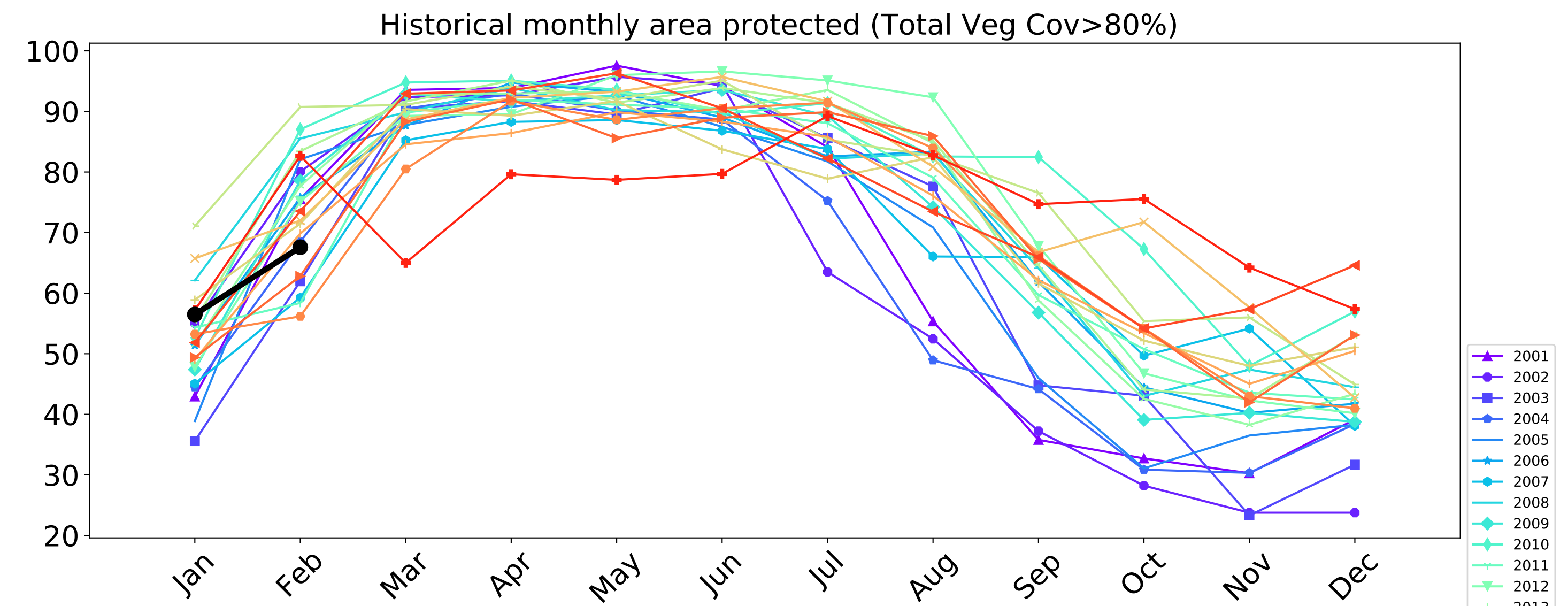
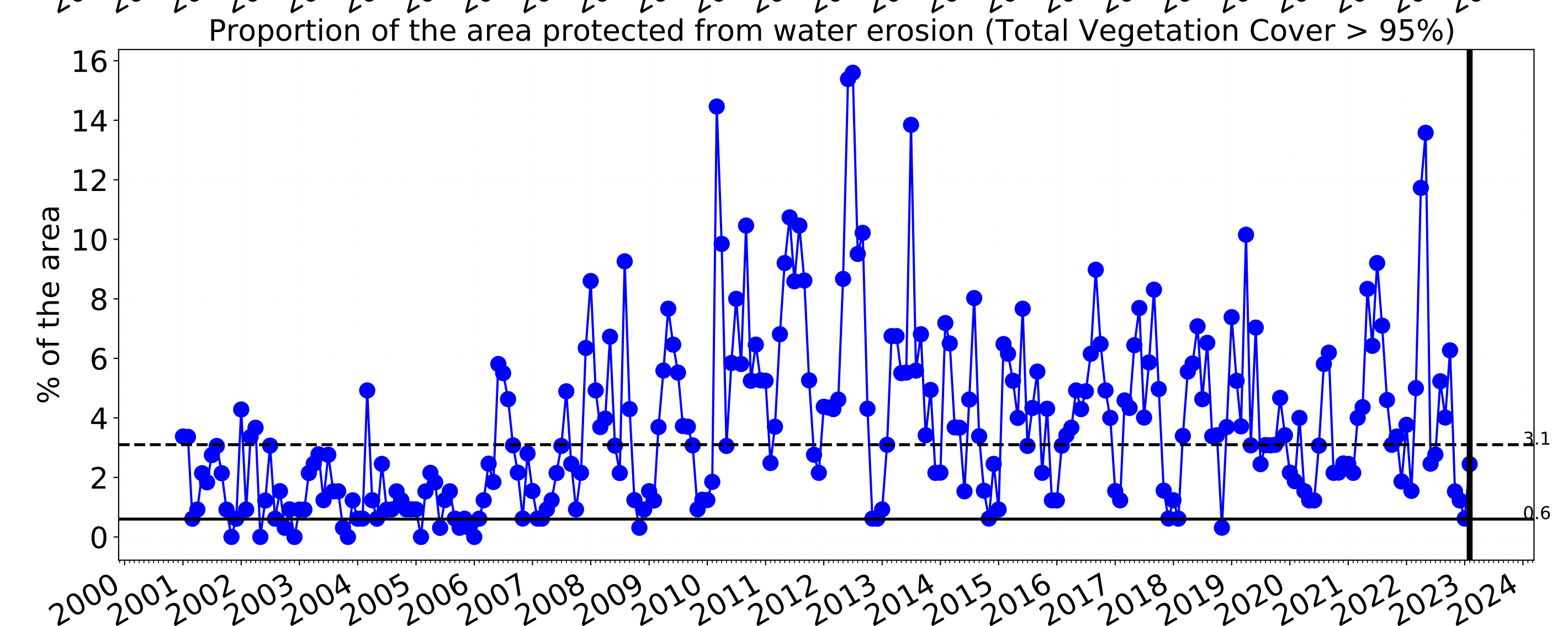
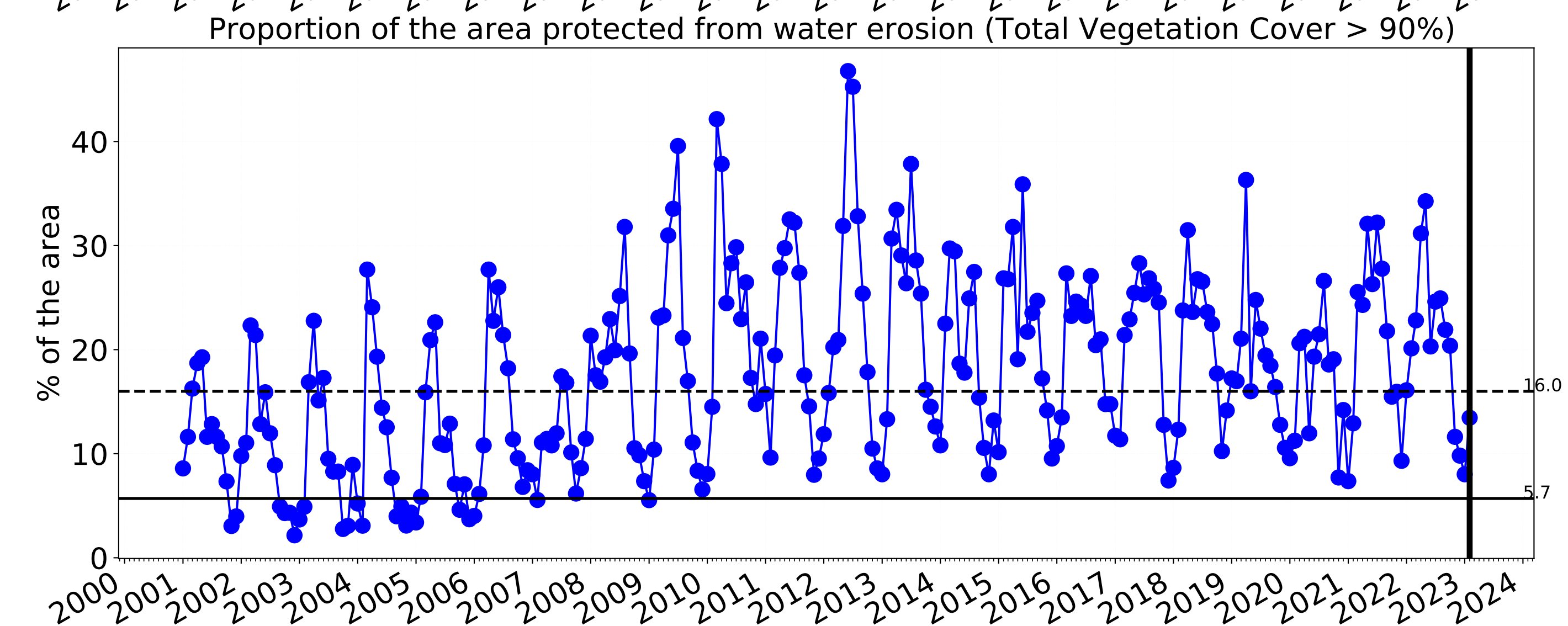
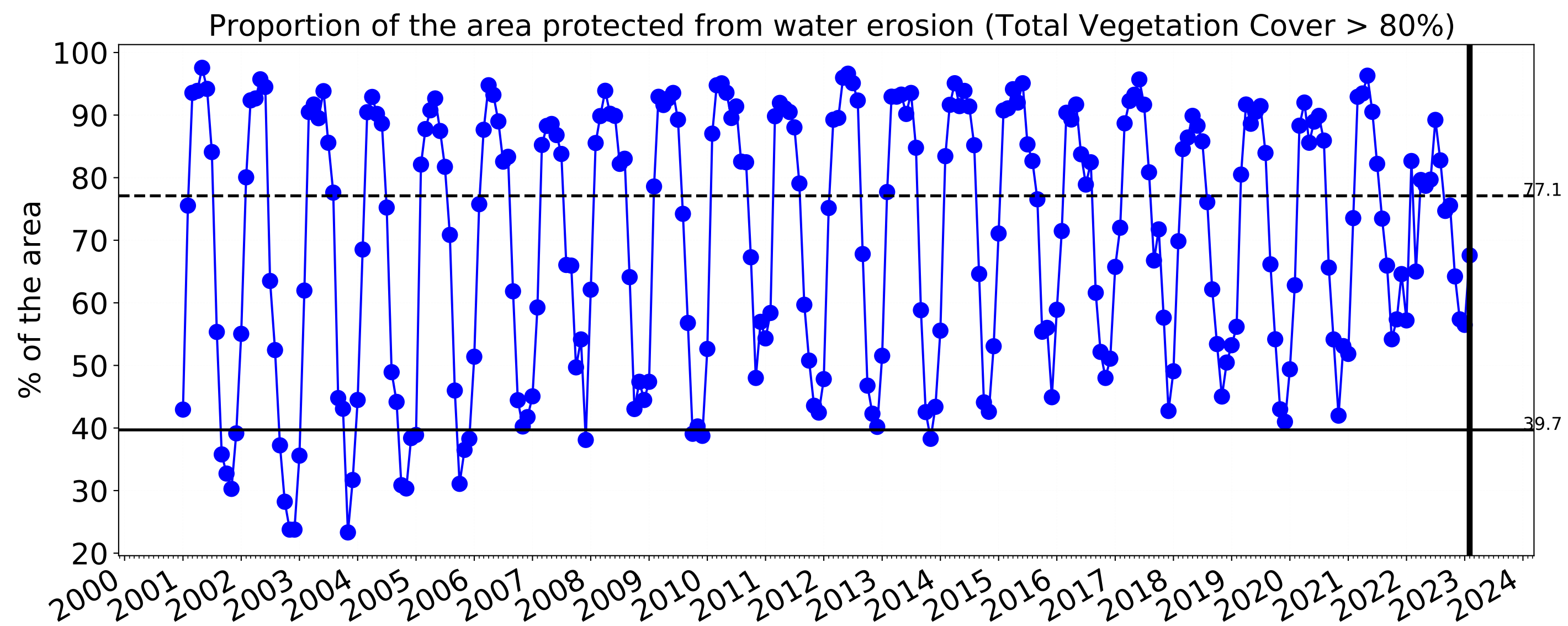
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Cropping timeseries





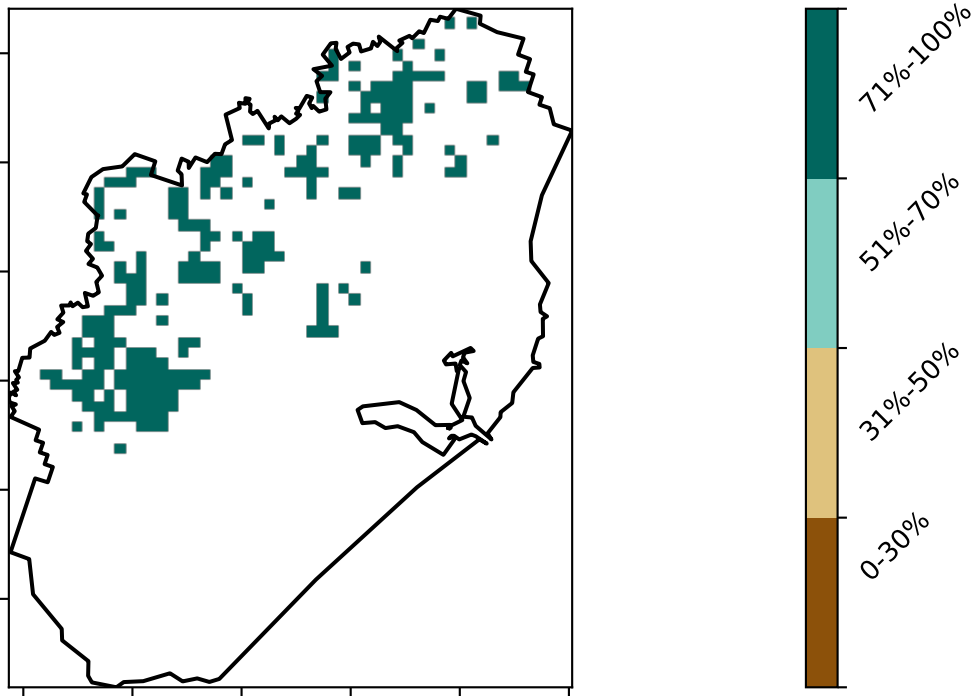
Horticulture

Land use and forest cover

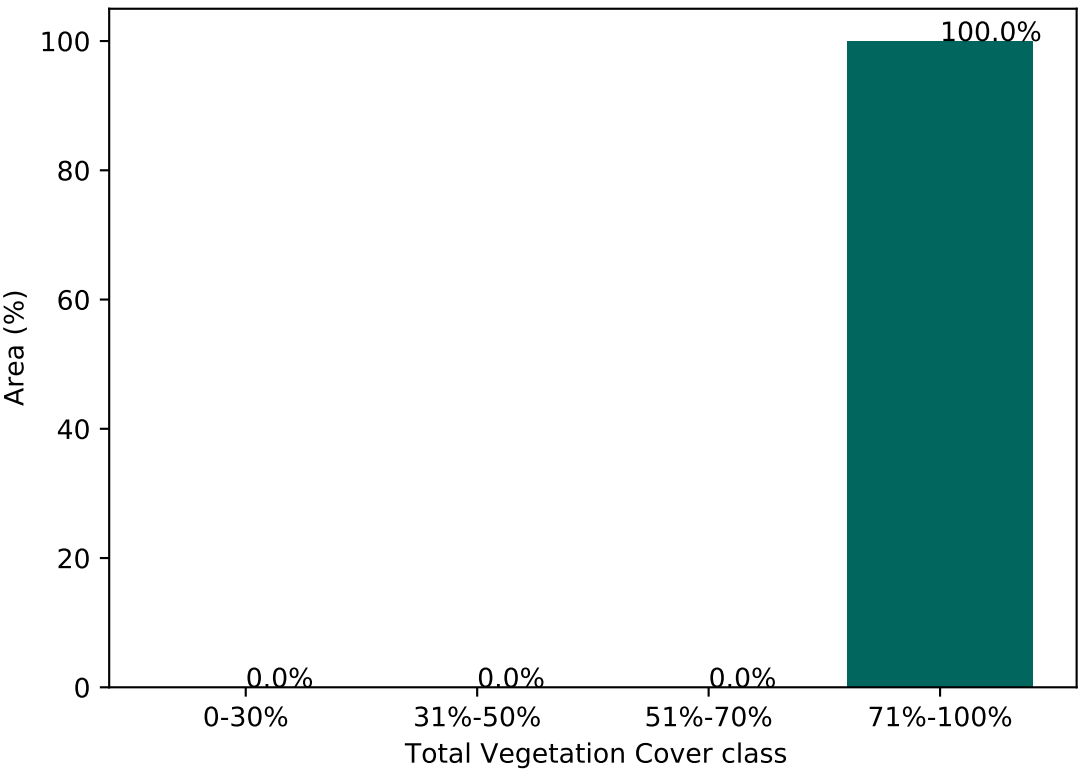


Catchment Scale
Land Use and Forests
of Australia (2018)
Derived from
Catchment Scale Land
Use of Australia
(2018) and Forests
of Australia (2018)

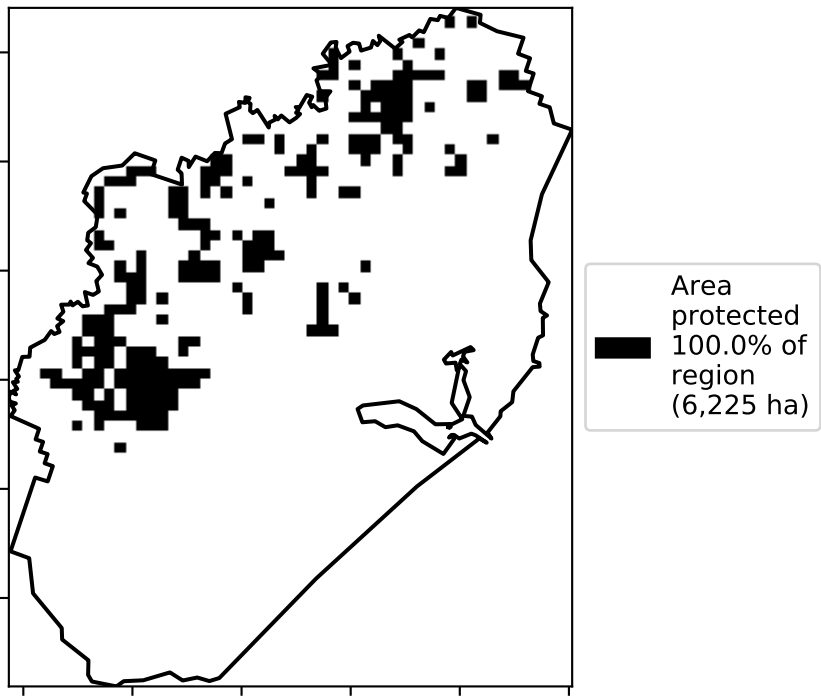
Total Vegetation Cover [%]



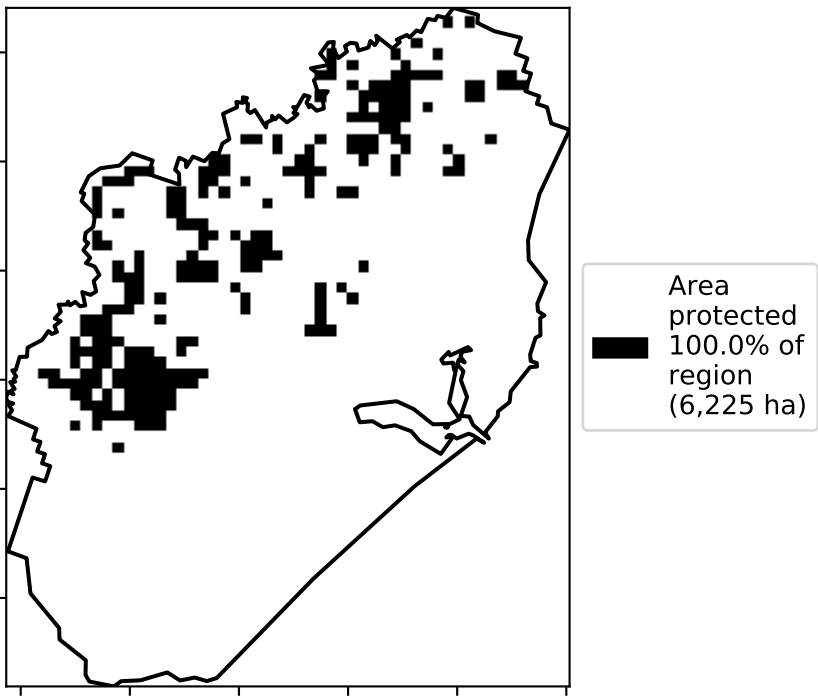
Proportion of vegetation cover class in area



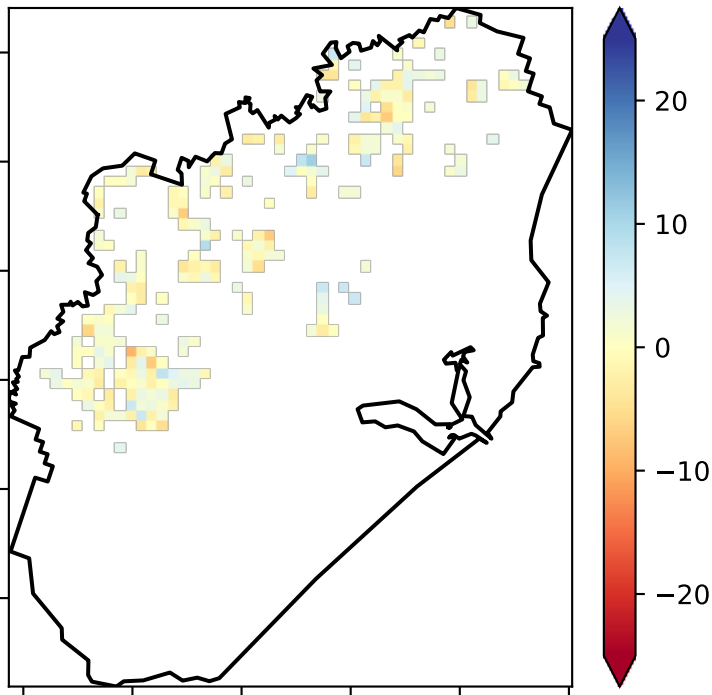
% Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

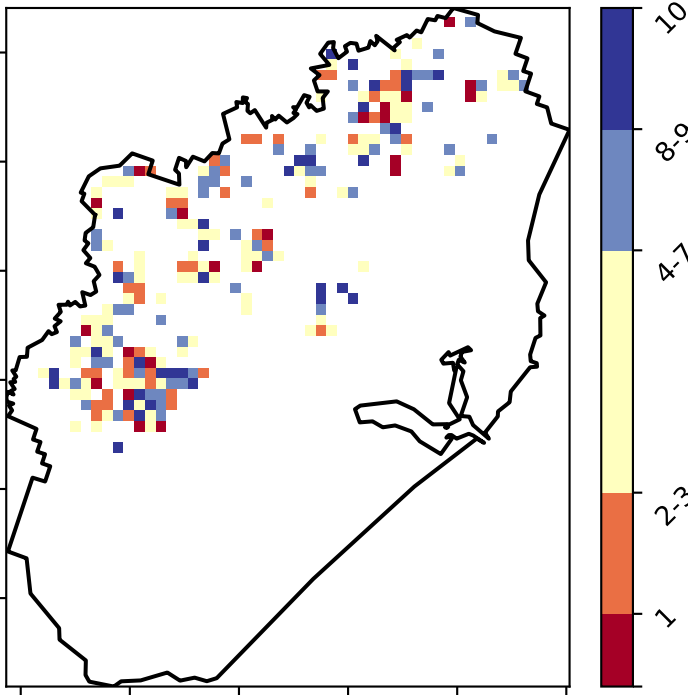


Total Vegetation Cover Anomaly [%]



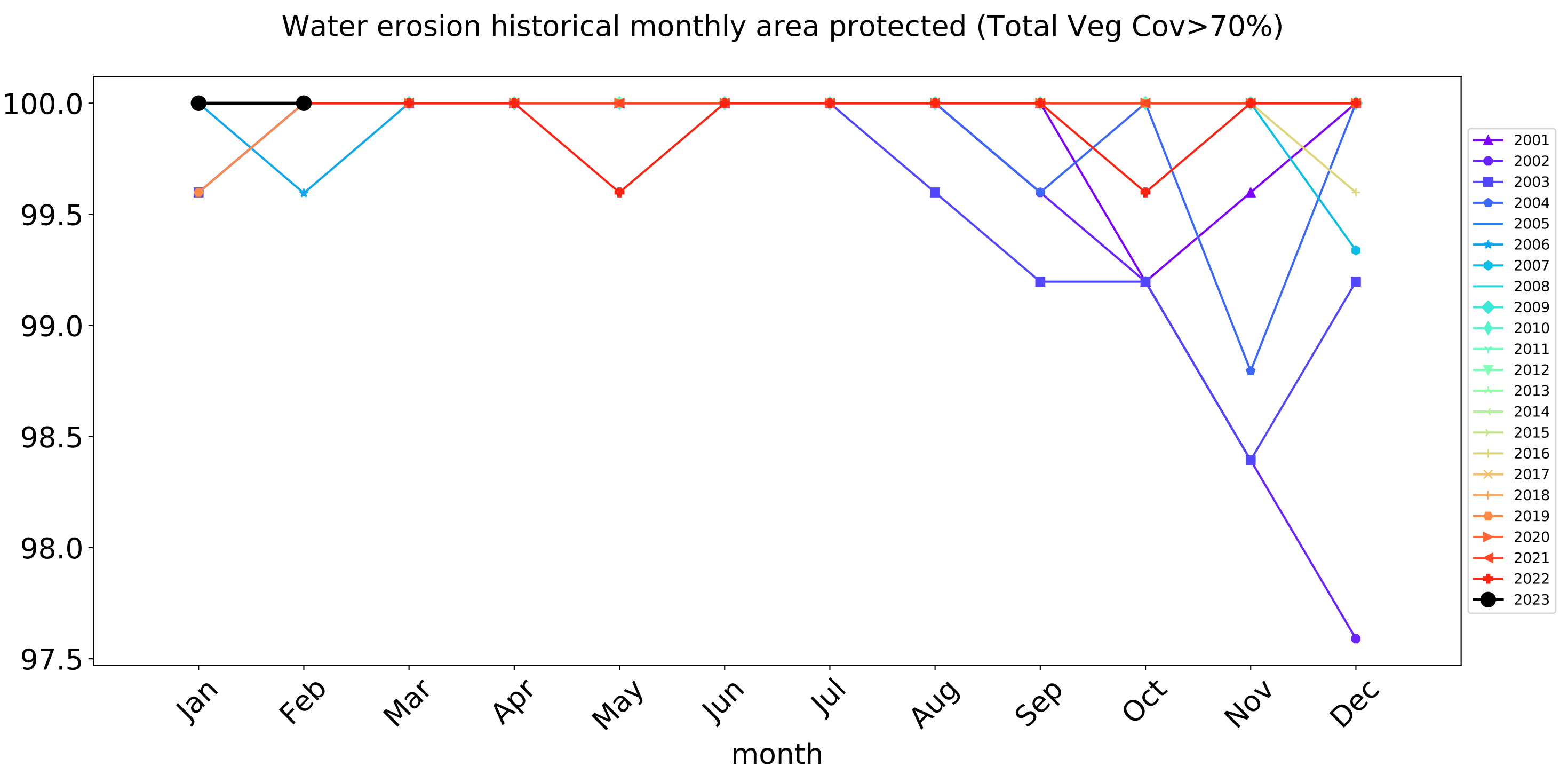
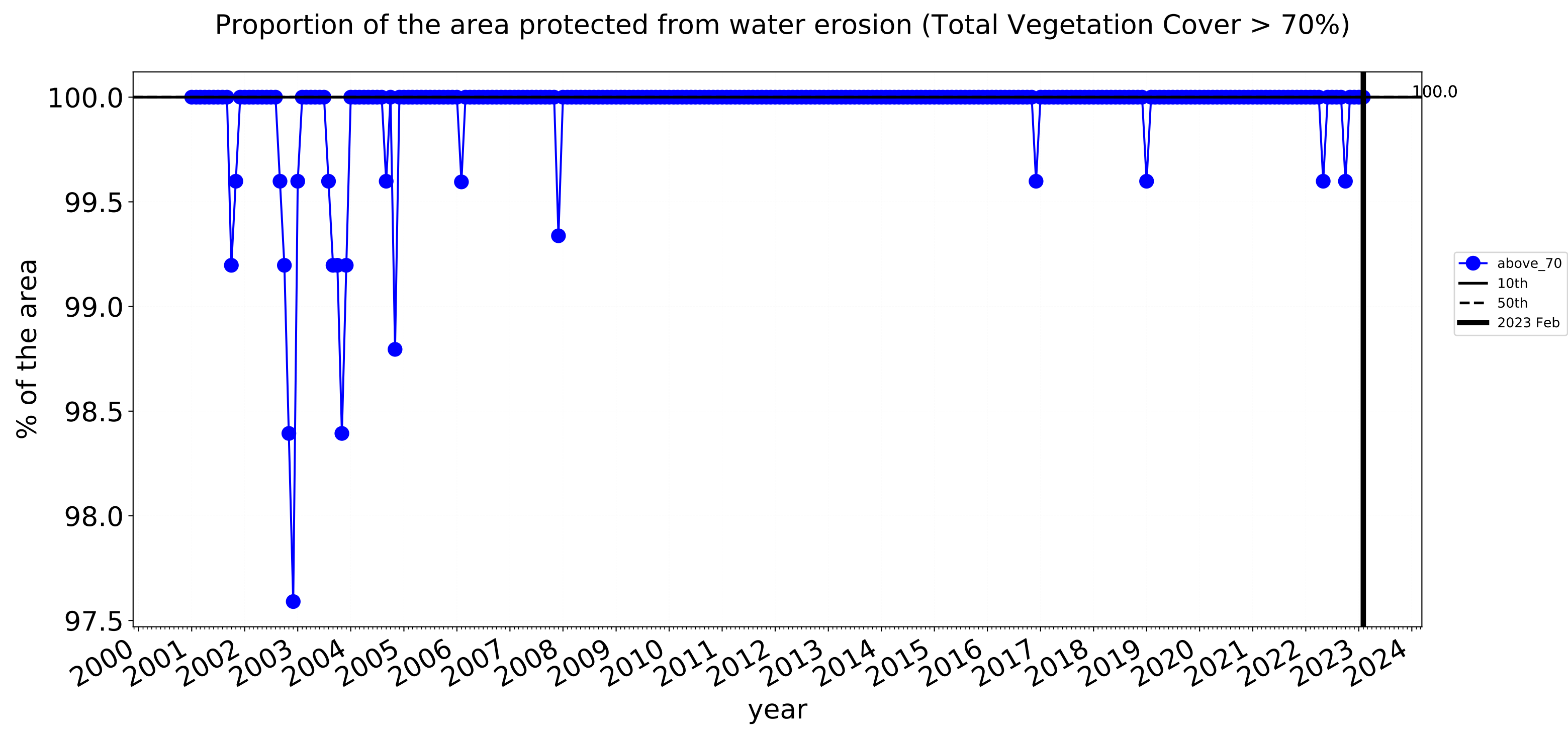
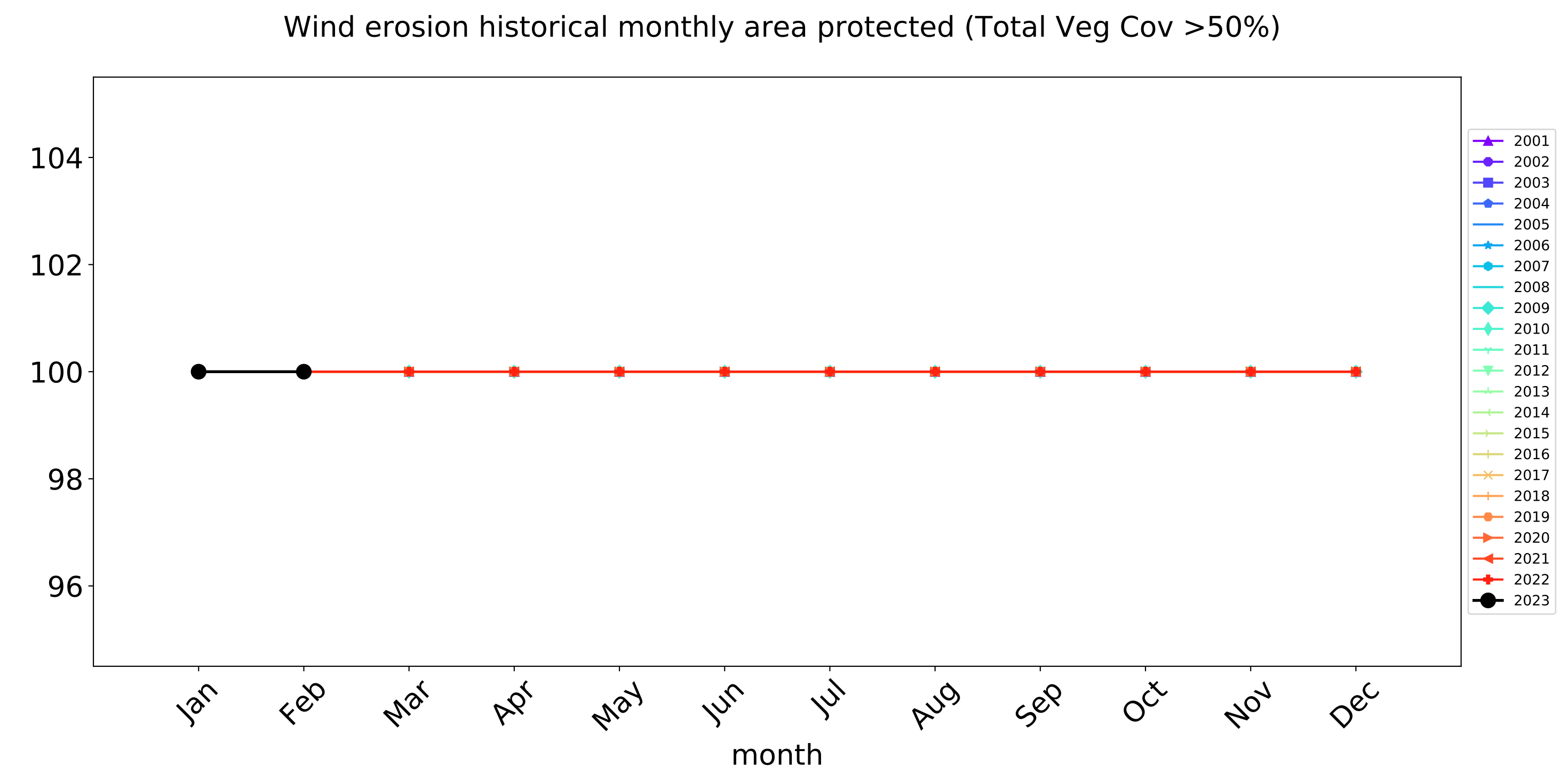
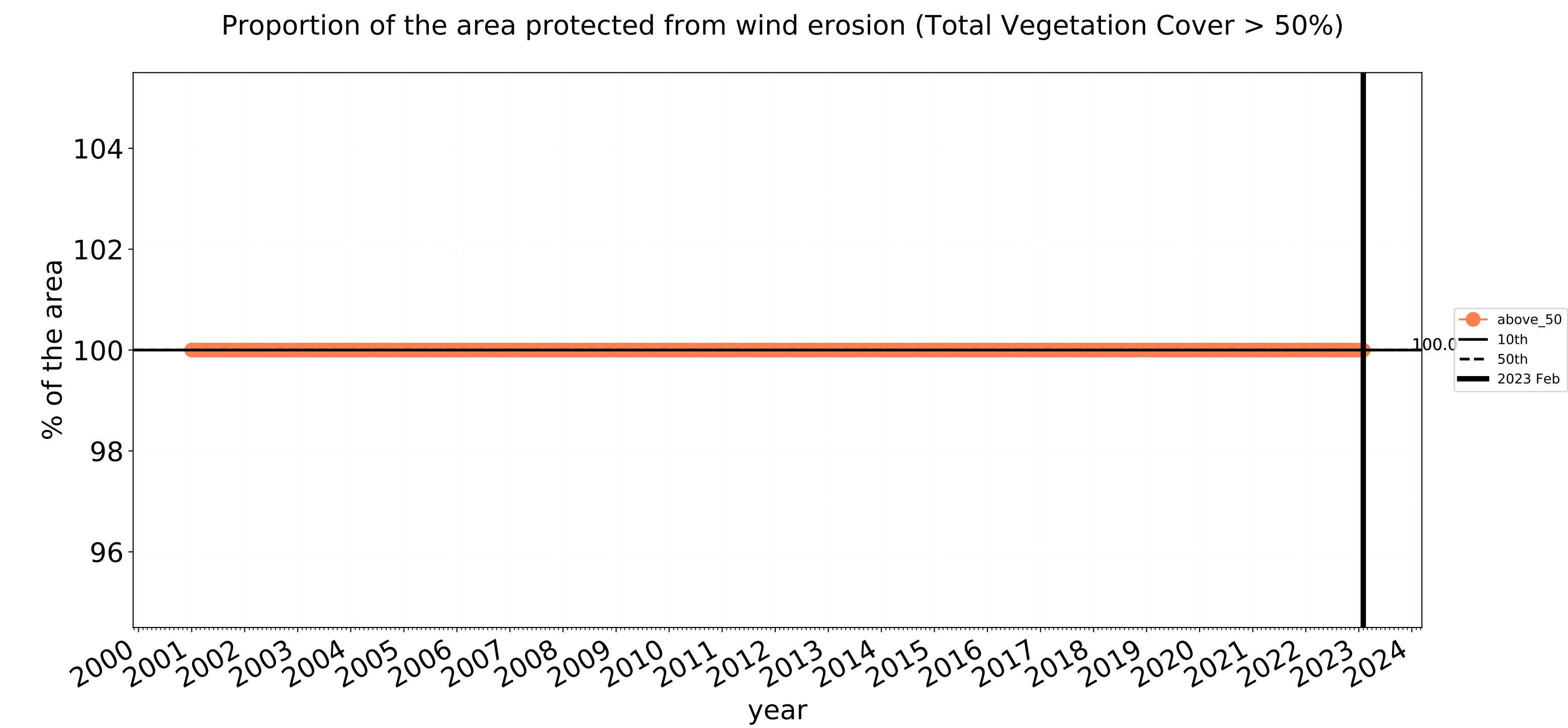
Anomaly show how
many percentage
points each
pixel is from
the mean. That
is, red pixels
are about 20%
lower than the
mean of that
pixel. The mean
is only for the
month of the map
using baseline
from 2001 to
2019.

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.

Horticulture timeseries

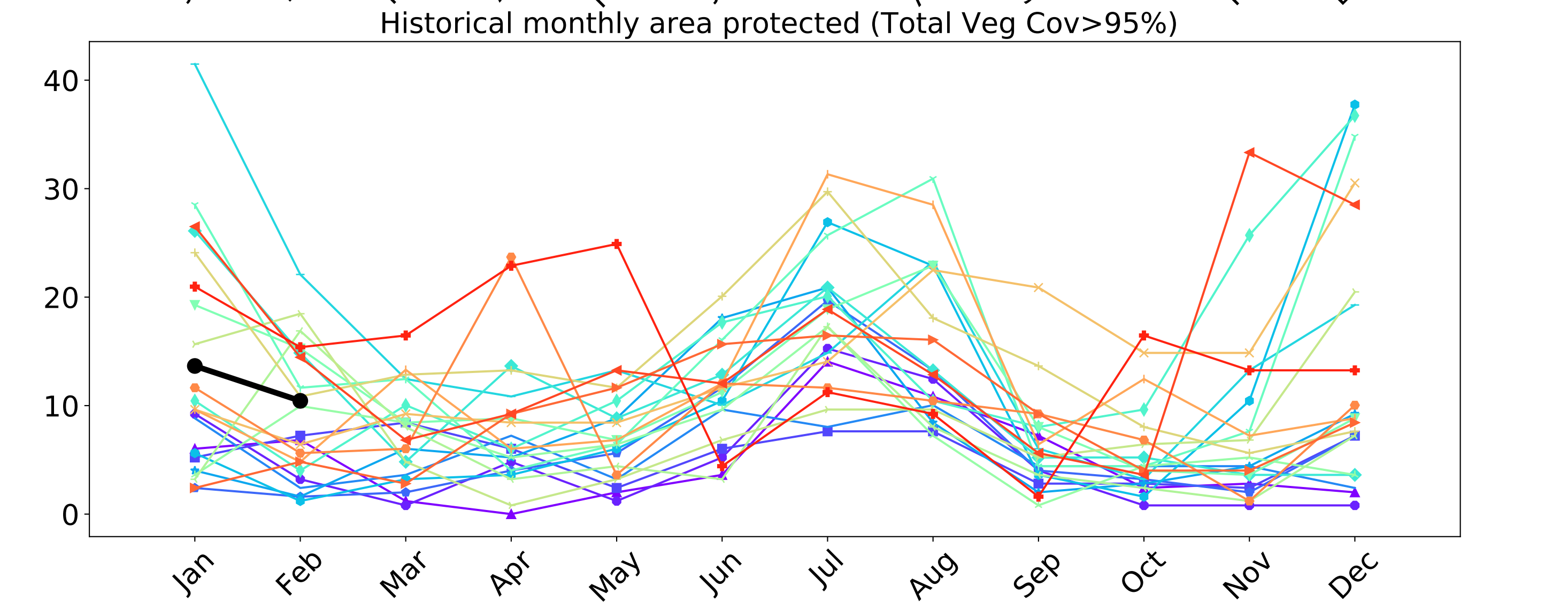
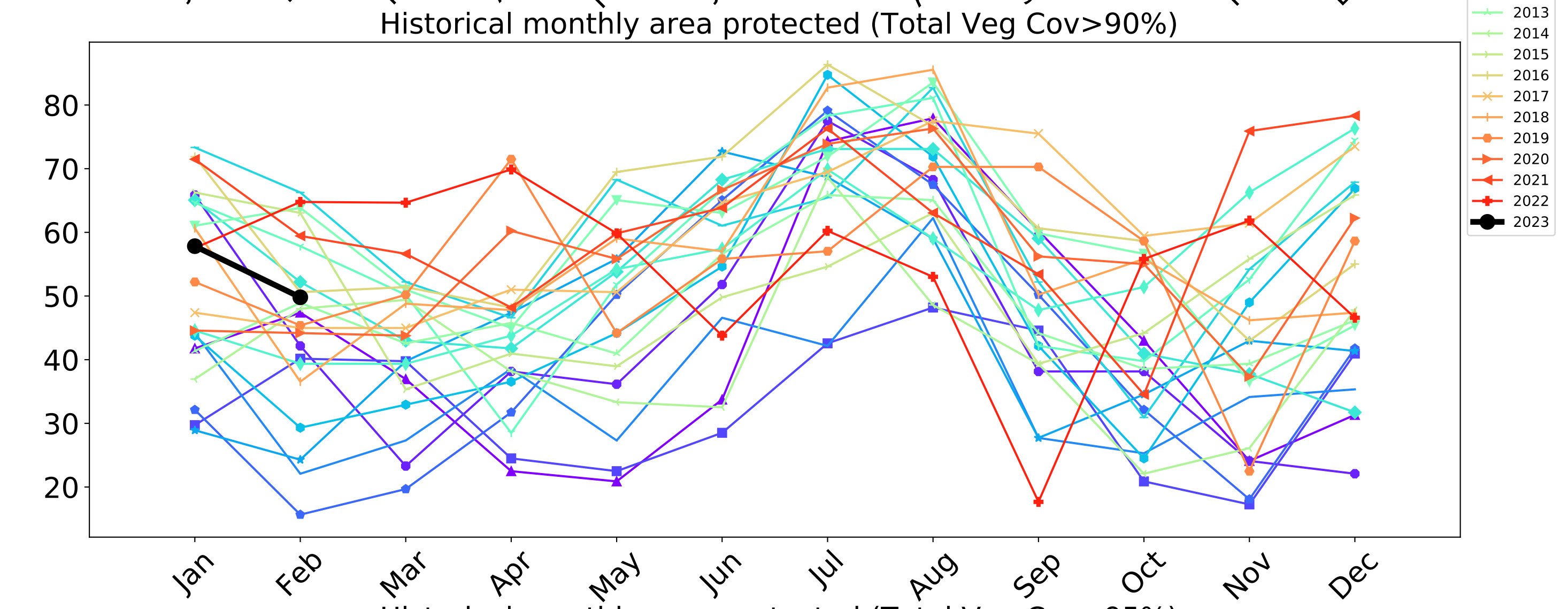
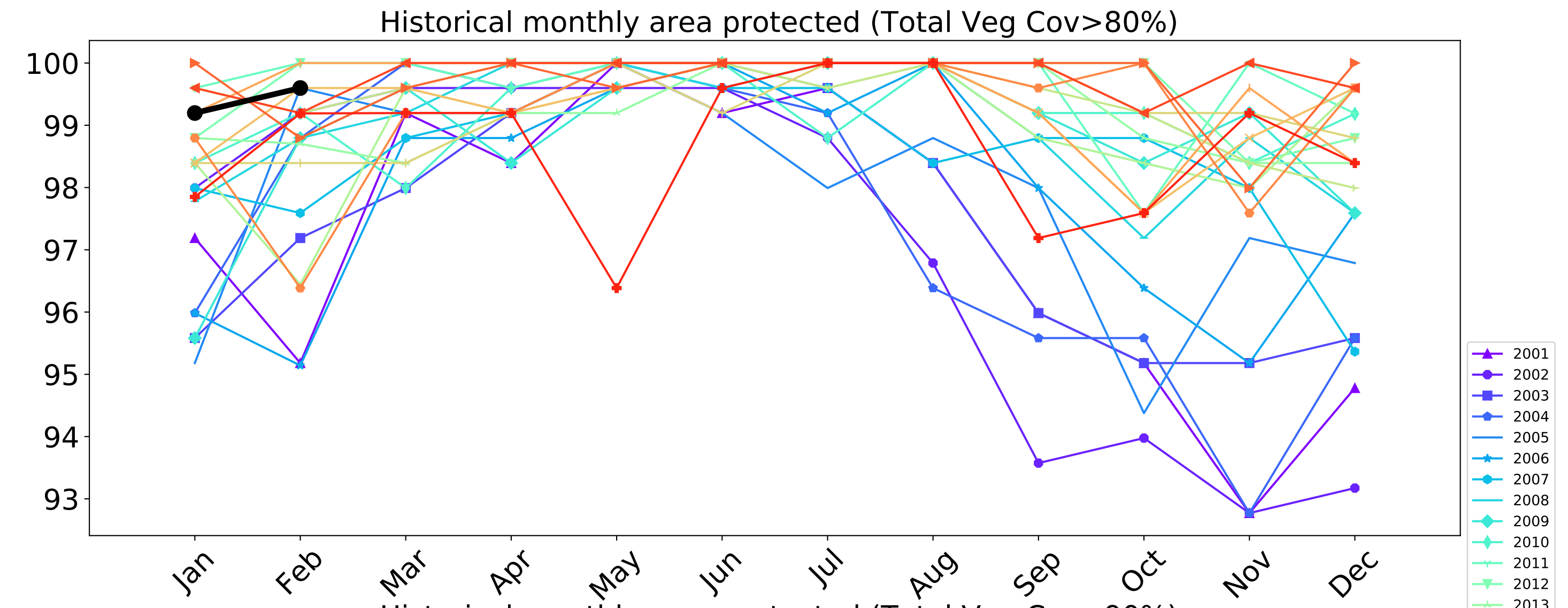
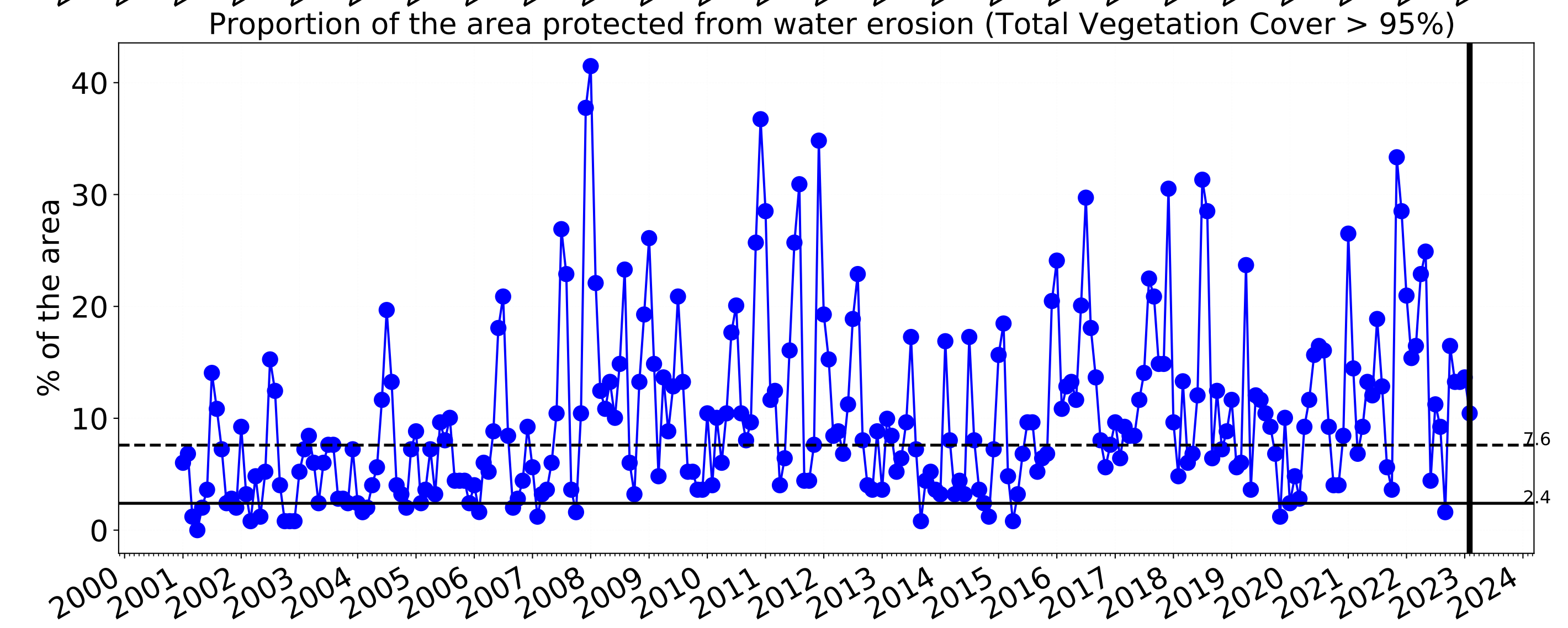
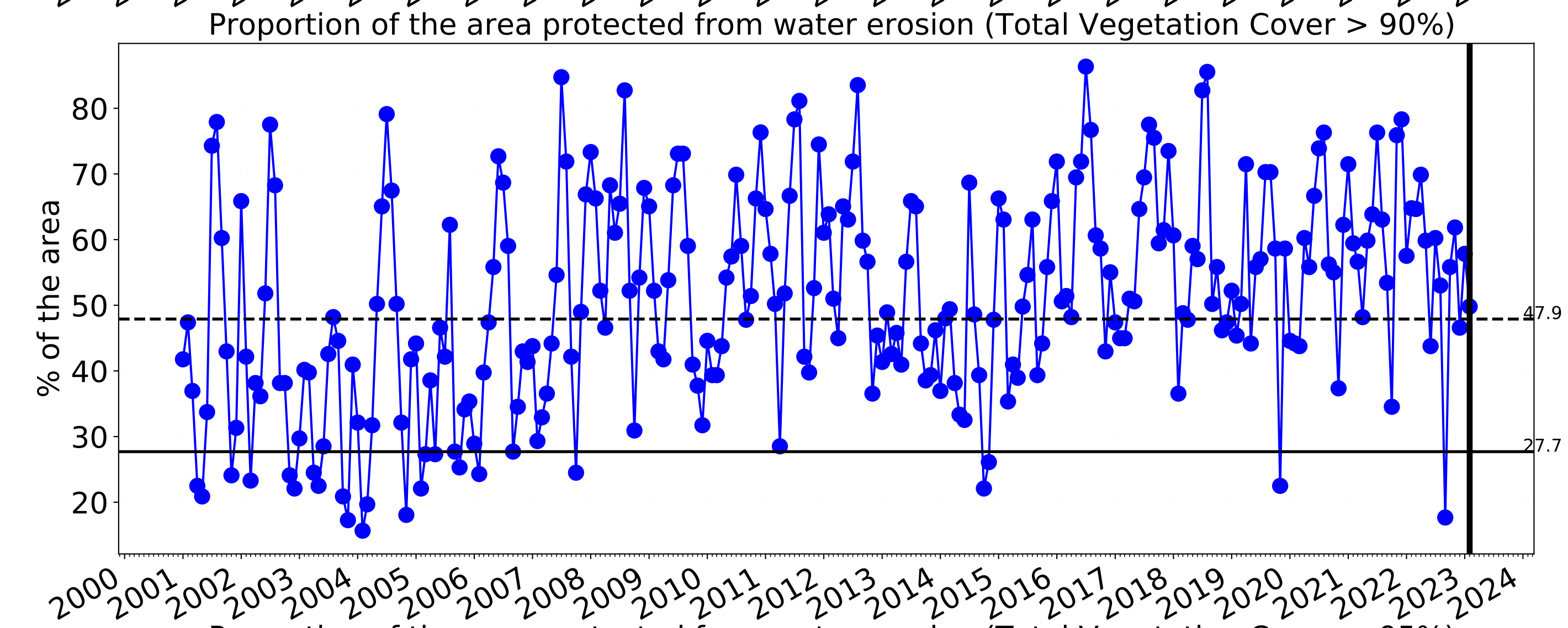
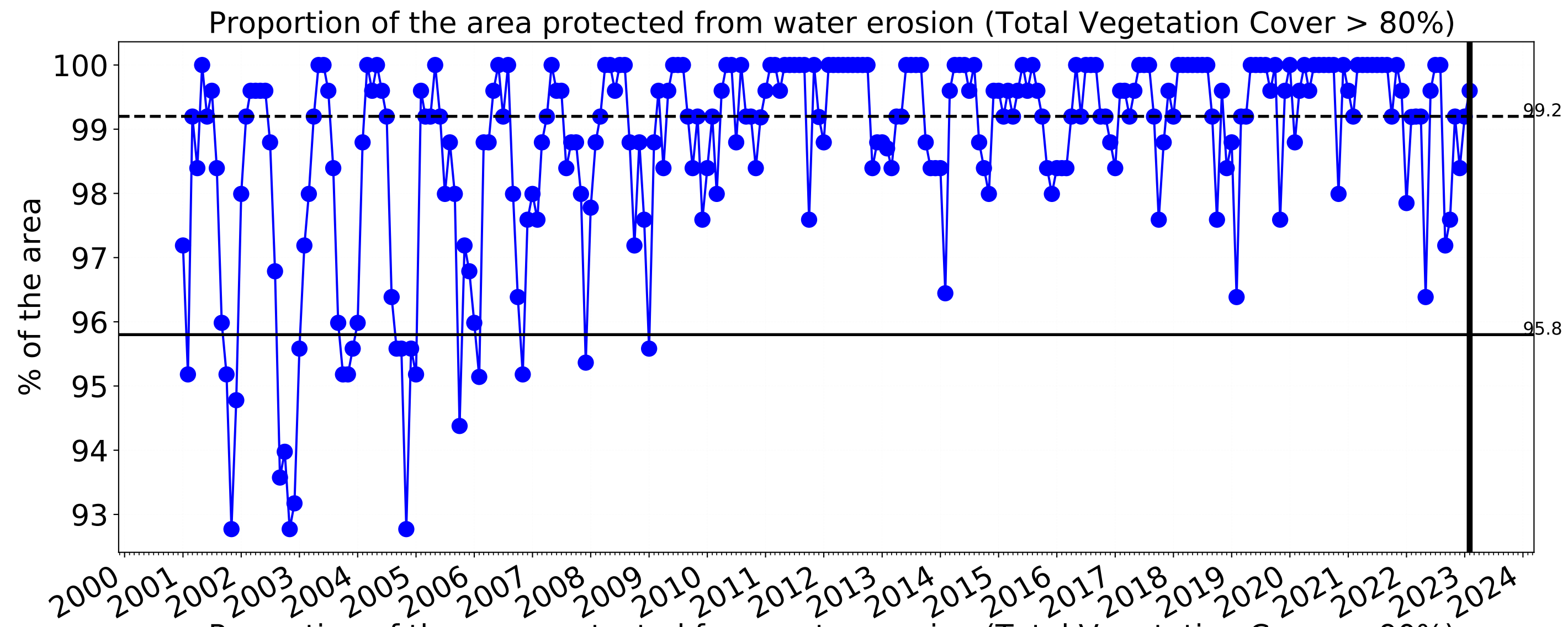


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Ballina_(A) (47,300 ha and no data 1,223 ha) Percentage area and hectares protected with TVC threshold 30,50,70,80,90 and 95%

Land use and forest cover Class	area(ha)	above_30	above_50	above_70	above_80	above_90	above_95
Entire region	47,300	99.9% 47,275	99.6% 47,125	96.8% 45,775	86.0% 40,675	36.6% 17,325	7.1% 3,375
Conservation and natural environments	5,650	100.0% 5,650	99.6% 5,625	97.3% 5,500	92.5% 5,225	50.4% 2,850	11.5% 650
Conservation and natural environments non forest	2,325	100.0% 2,325	98.9% 2,300	95.7% 2,225	88.2% 2,050	53.8% 1,250	16.1% 375
Conservation and natural environments Woodland forest	1,375	100.0% 1,375	100.0% 1,375	100.0% 1,375	94.5% 1,300	49.1% 675	3.6% 50
Conservation and natural environments Forest (non woodland)	1,950	100.0% 1,950	100.0% 1,950	97.4% 1,900	96.2% 1,875	47.4% 925	11.5% 225
Agriculture	31,850	99.9% 31,825	99.9% 31,825	98.5% 31,375	89.0% 28,350	37.0% 11,775	6.5% 2,075
Grazing	17,350	99.9% 17,325	99.9% 17,325	99.0% 17,175	95.2% 16,525	43.4% 7,525	7.1% 1,225
Grazing non forest	16,675	99.9% 16,650	99.9% 16,650	99.0% 16,500	95.2% 15,875	42.3% 7,050	6.6% 1,100
Grazing Woodland forest	500	100.0% 500	100.0% 500	100.0% 500	95.0% 475	80.0% 400	25.0% 125
Cropping	8,175	100.0% 8,175	100.0% 8,175	96.3% 7,875	67.6% 5,525	13.5% 1,100	2.4% 200
Horticulture	6,225	100.0% 6,225	100.0% 6,225	100.0% 6,225	99.6% 6,200	49.8% 3,100	10.4% 650