# Total vegetation cover soil protection Region:LGA Mackay (R) QLD

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:

**Date: December 2022** 

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 Dec 2022**

## Land use and forest cover

Catchment Scale

of Australia (2018)

Derived from

Use of Australia

(2018) and Forests

of Australia (2018)

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

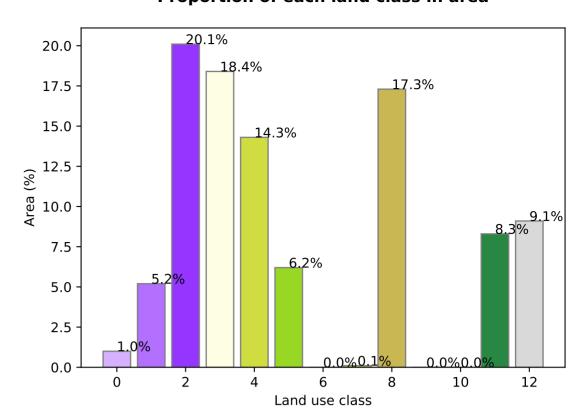
using baseline from 2001 to

2019.

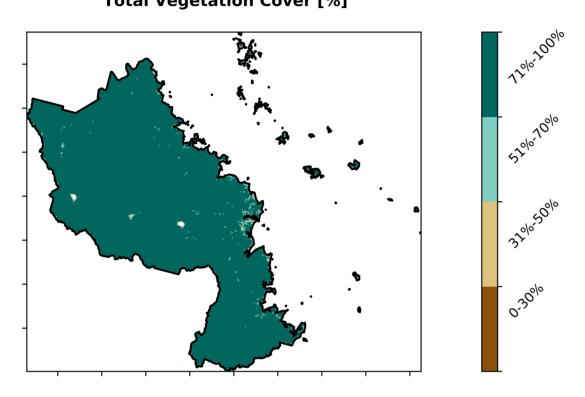
Land Use and Forests

# 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 Catchment Scale Land 6 Agriculture - Grazing - Non-woodland forest 7 Agriculture - Grazing - Irrigated 8 Agriculture - Cropping - Non-irrigated 9 Agriculture - Cropping - Irrigated 10 Agriculture - Horticulture - Non-irrigated 11 Agriculture - Horticulture - Irrigated 12 Production native forests and plantation forests 13 Other uses

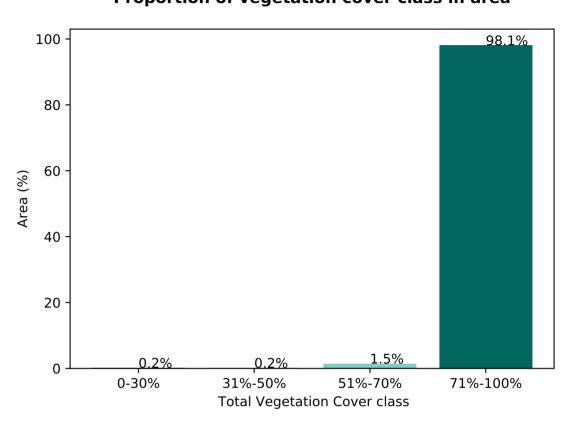
# **Proportion of each land class in area**



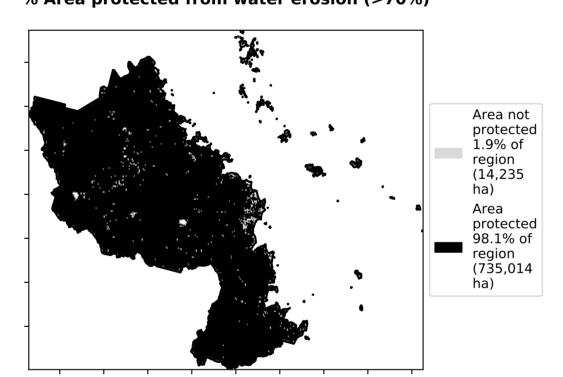
# **Total Vegetation Cover [%]**



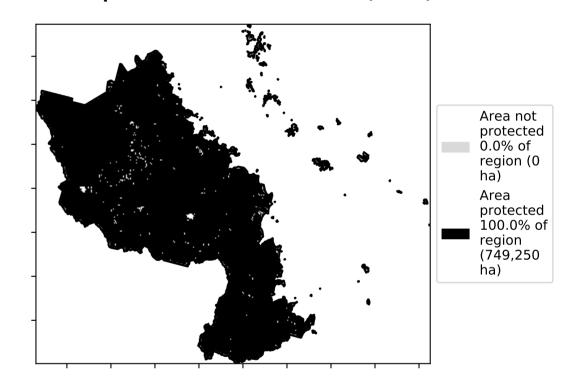
Proportion of vegetation cover class in area



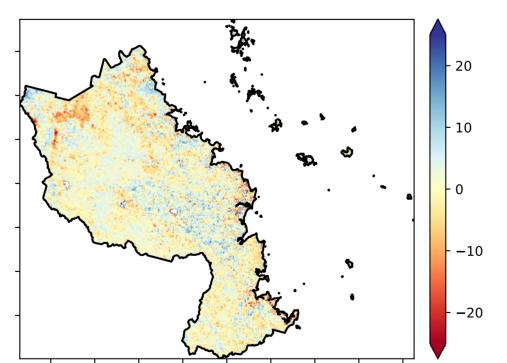
# % Area protected from water erosion (>70%)



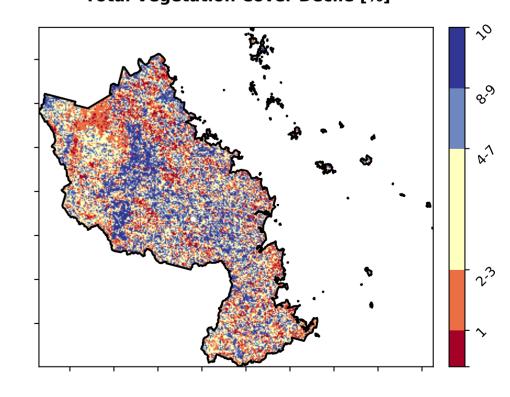
% Area protected from wind erosion (>50%)



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



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

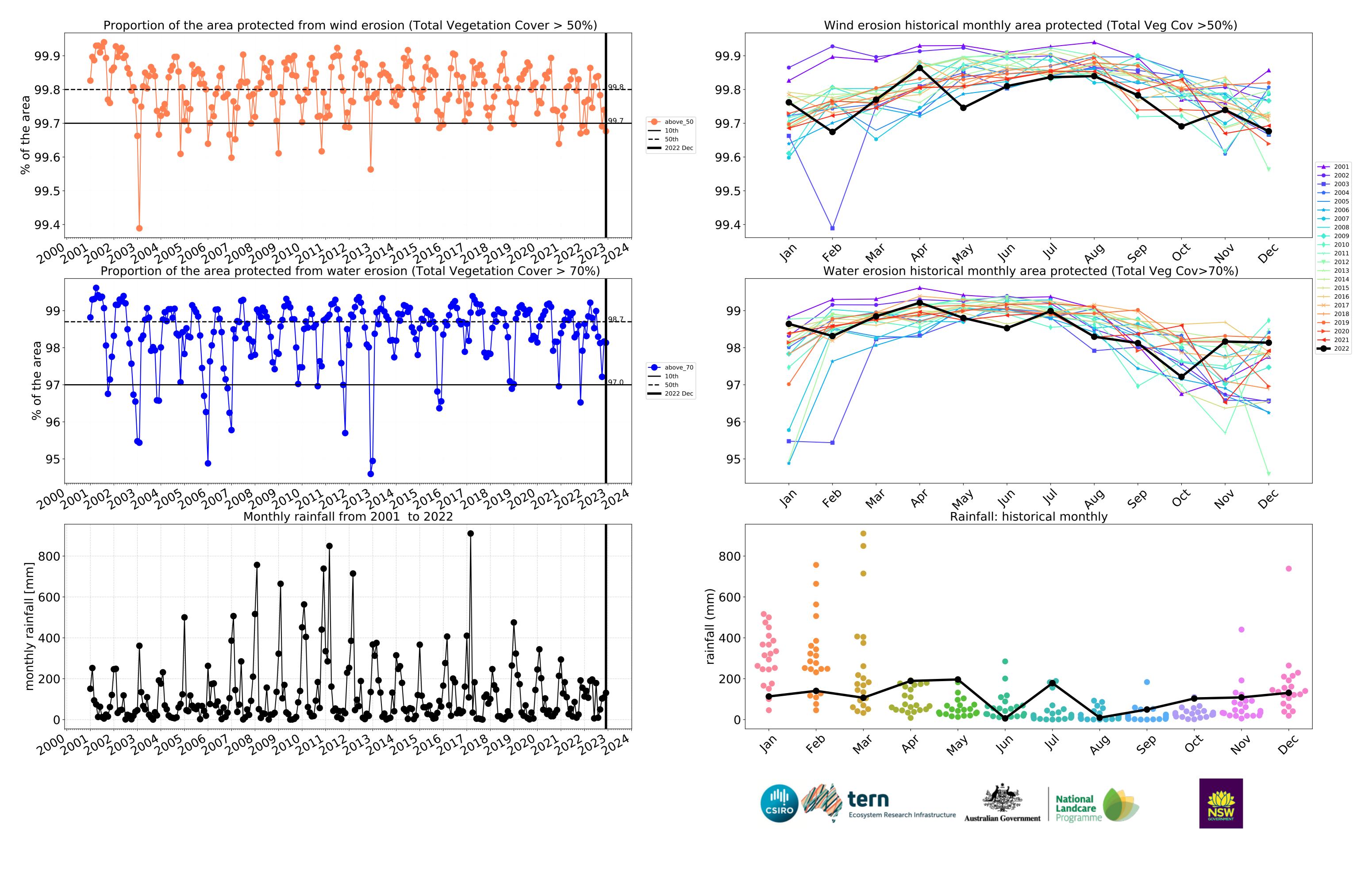




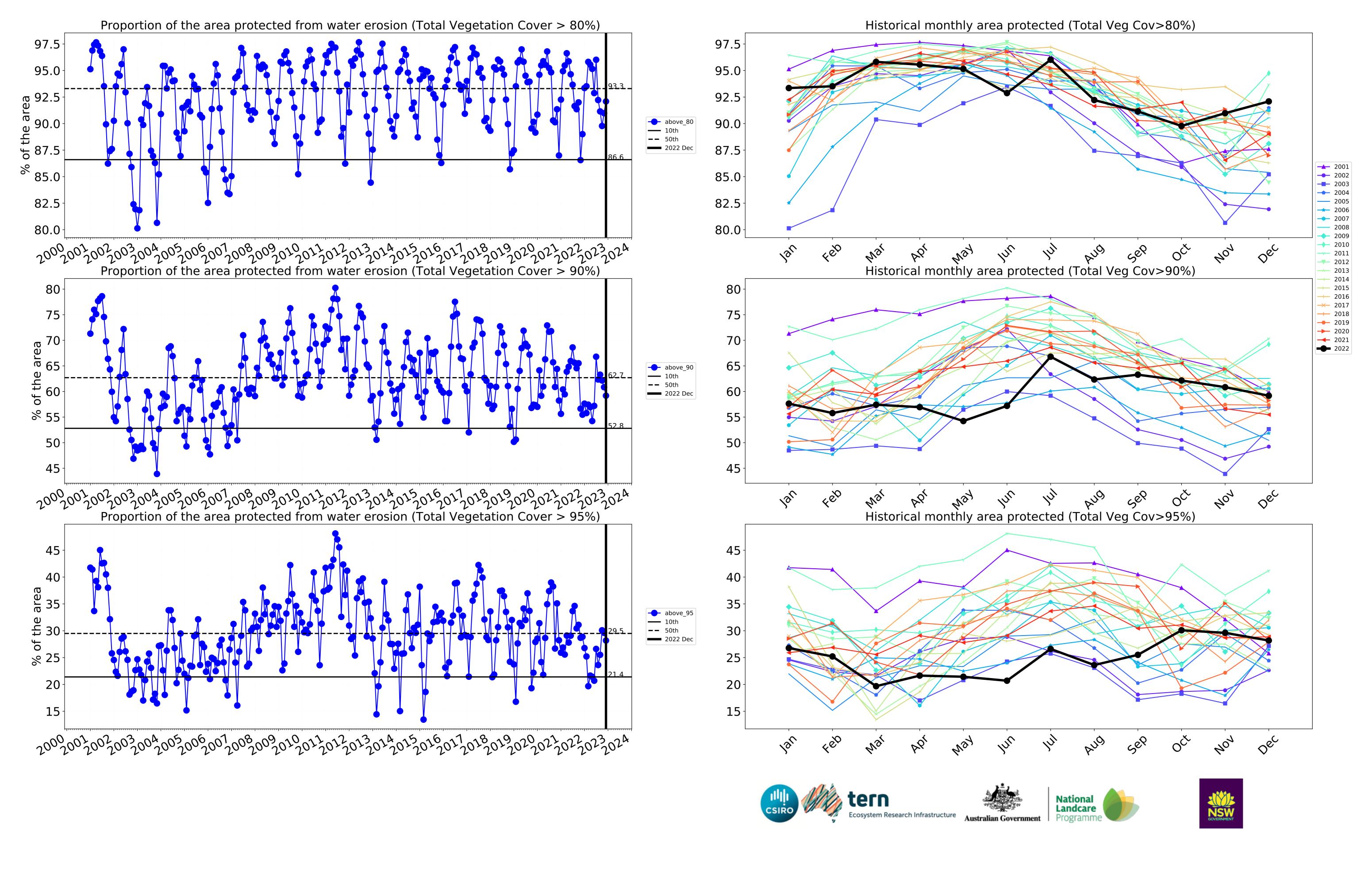








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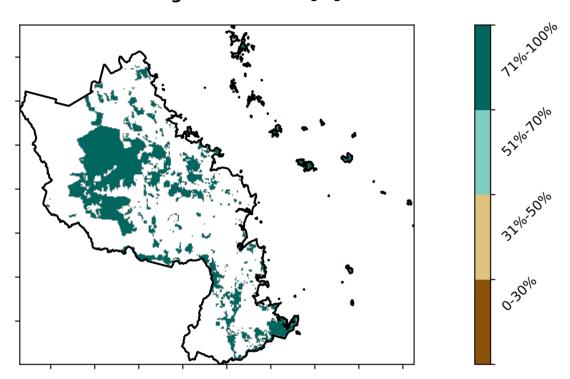


# **Conservation and natural environments**

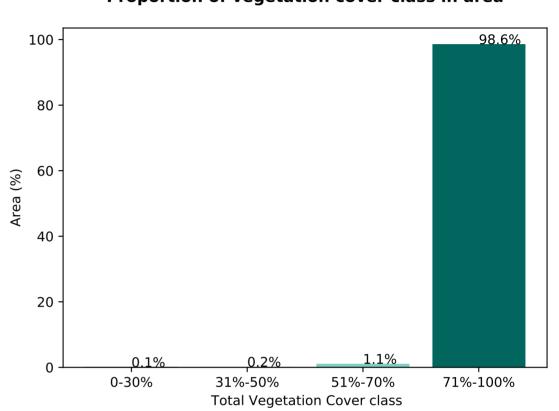
# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) Australia (2018) Catchment Scale Land C

# **Proportion of each land class in area** 80 76.5% 70 60 50 Area (%) 30 19.8% 20 10 3.7% 1.0 2.0 2.5 1.5 -0.50.0 0.5 Land use class

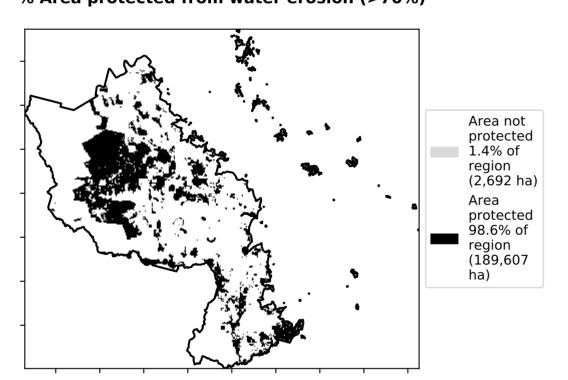
# Total Vegetation Cover [%]



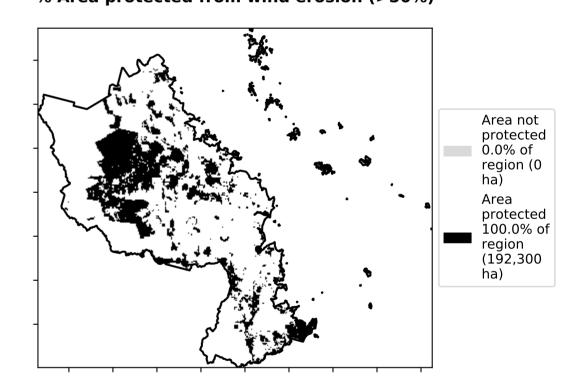
Proportion of vegetation cover class in area



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



% Area protected from wind erosion (>50%)



# Total Vegetation Cover Anomaly [%]

Anomaly show how many percetage points each pixel is from

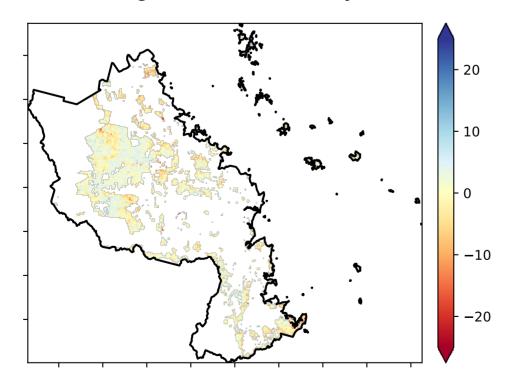
the mean. That

pixel. The mean

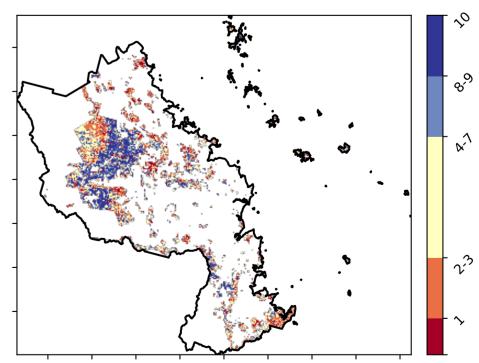
using baseline from 2001 to 2019.

is only for the month of the map

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



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



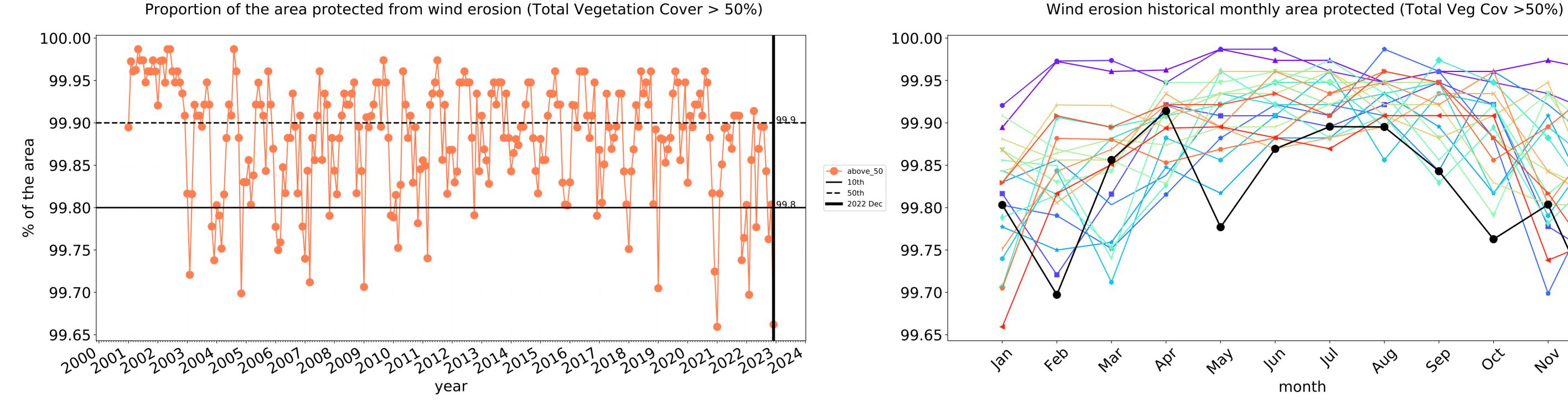


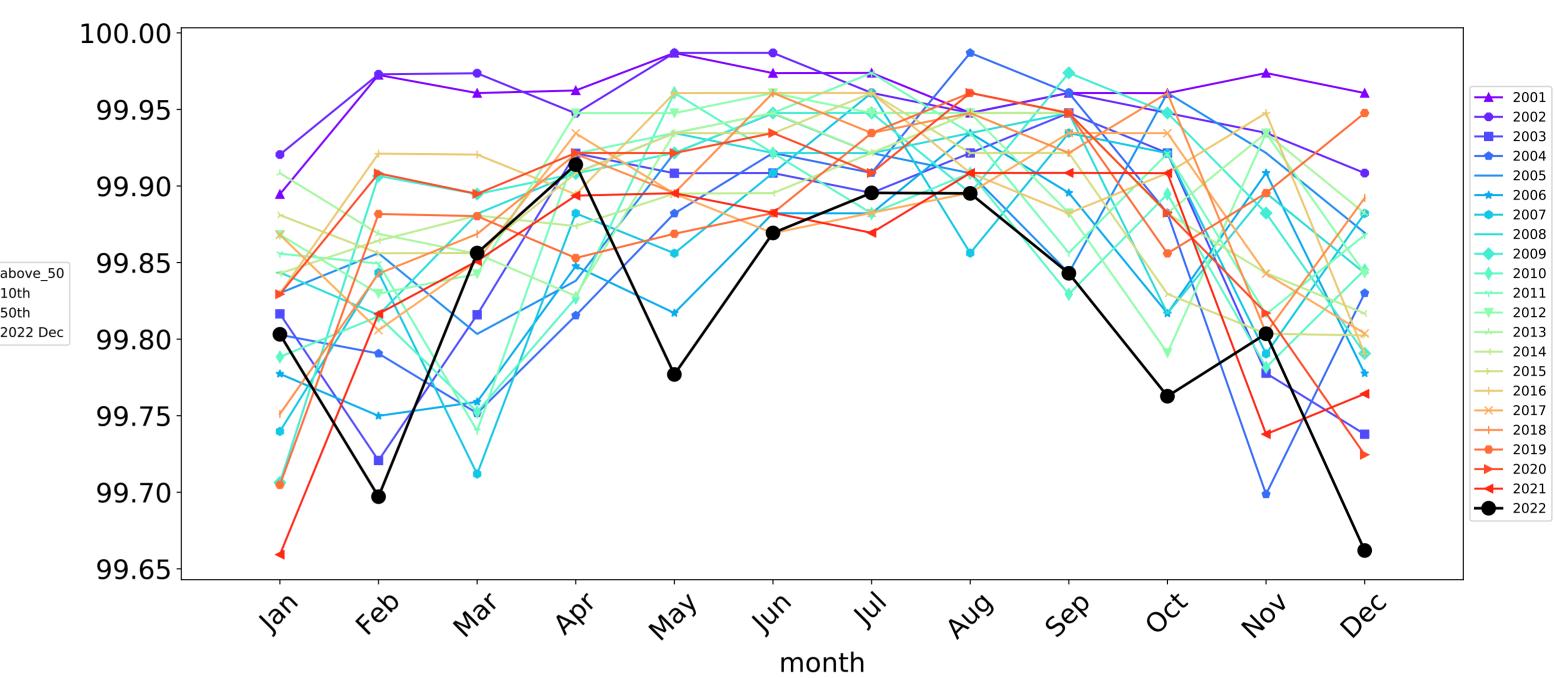


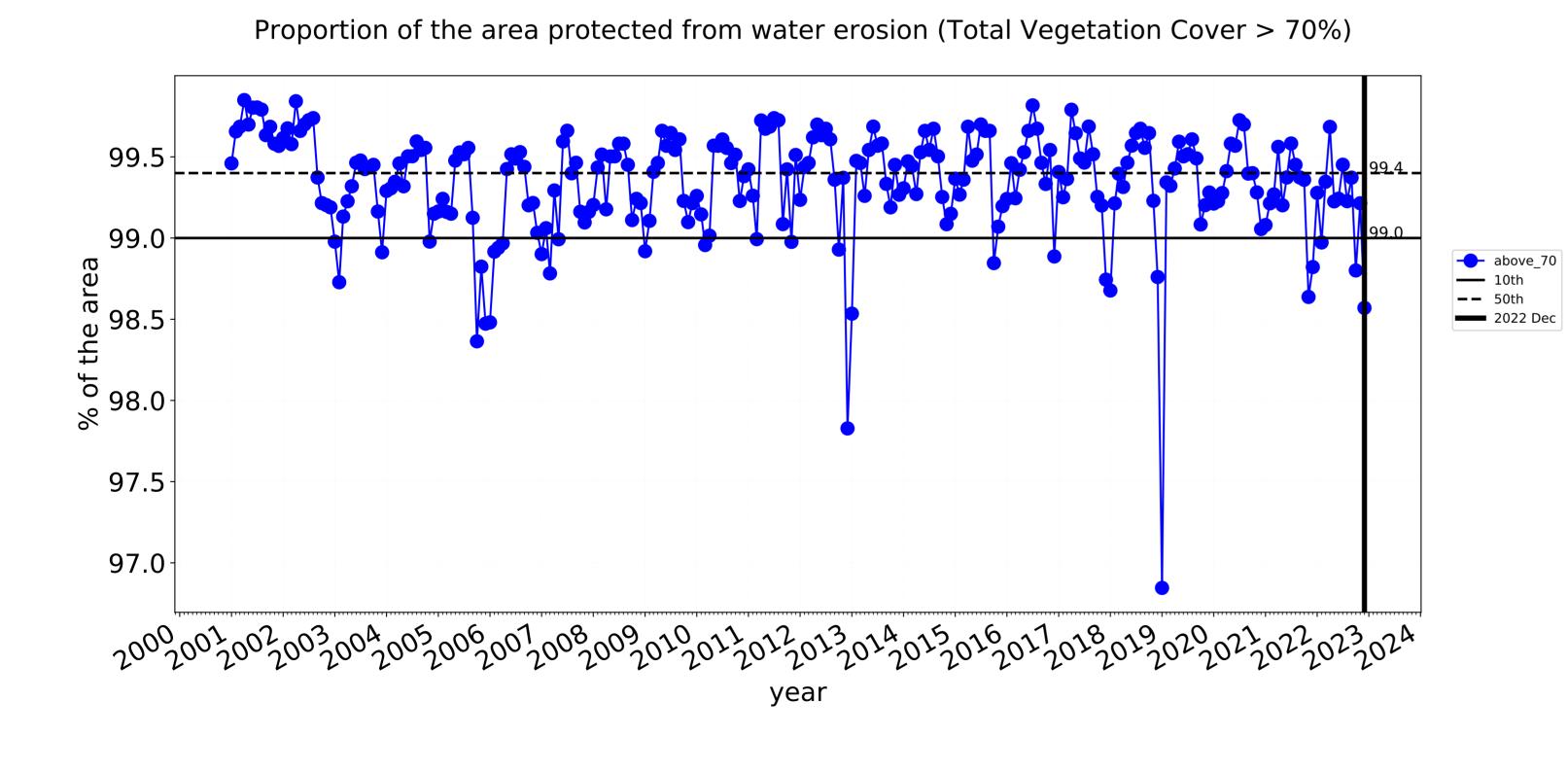


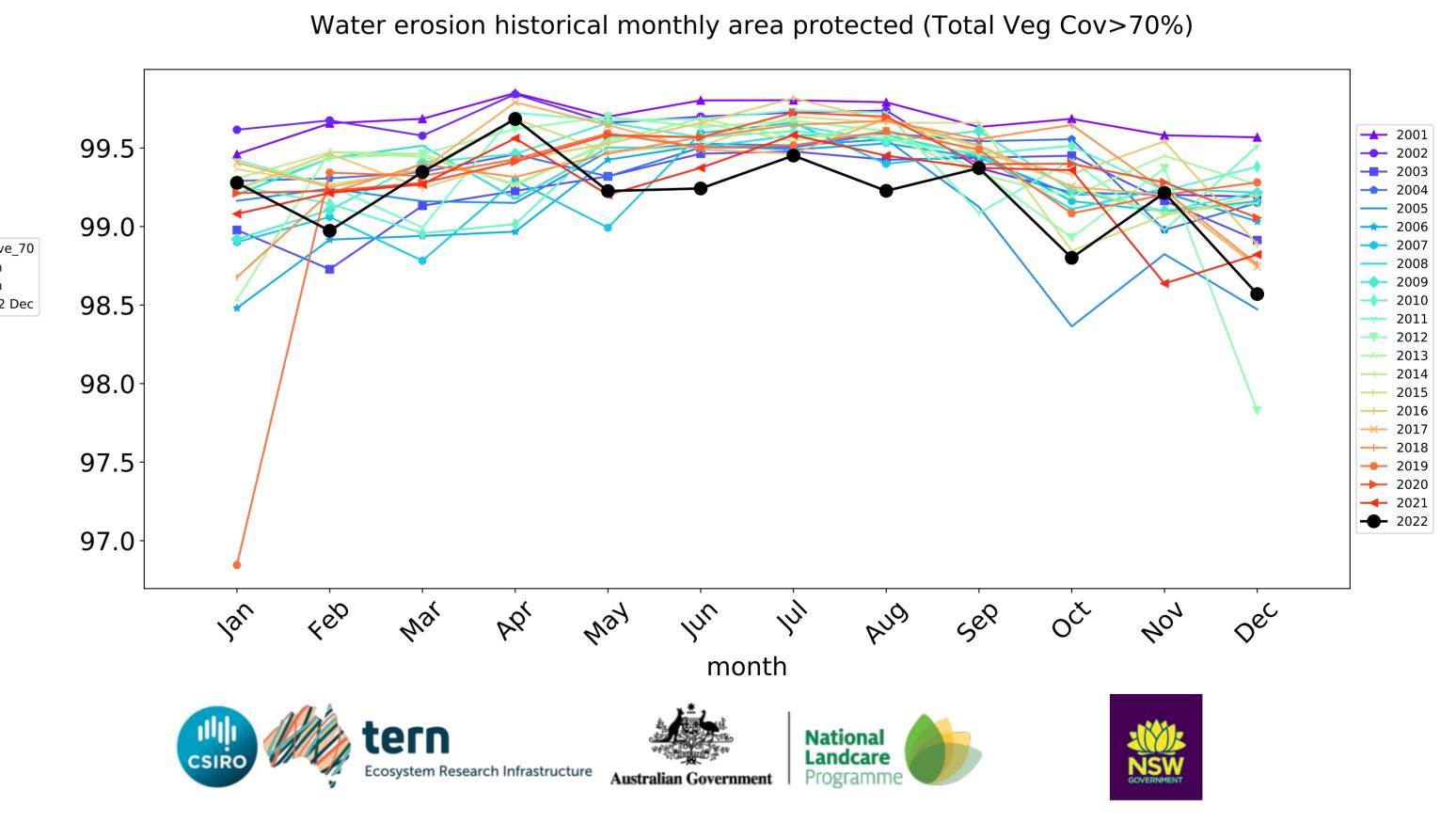


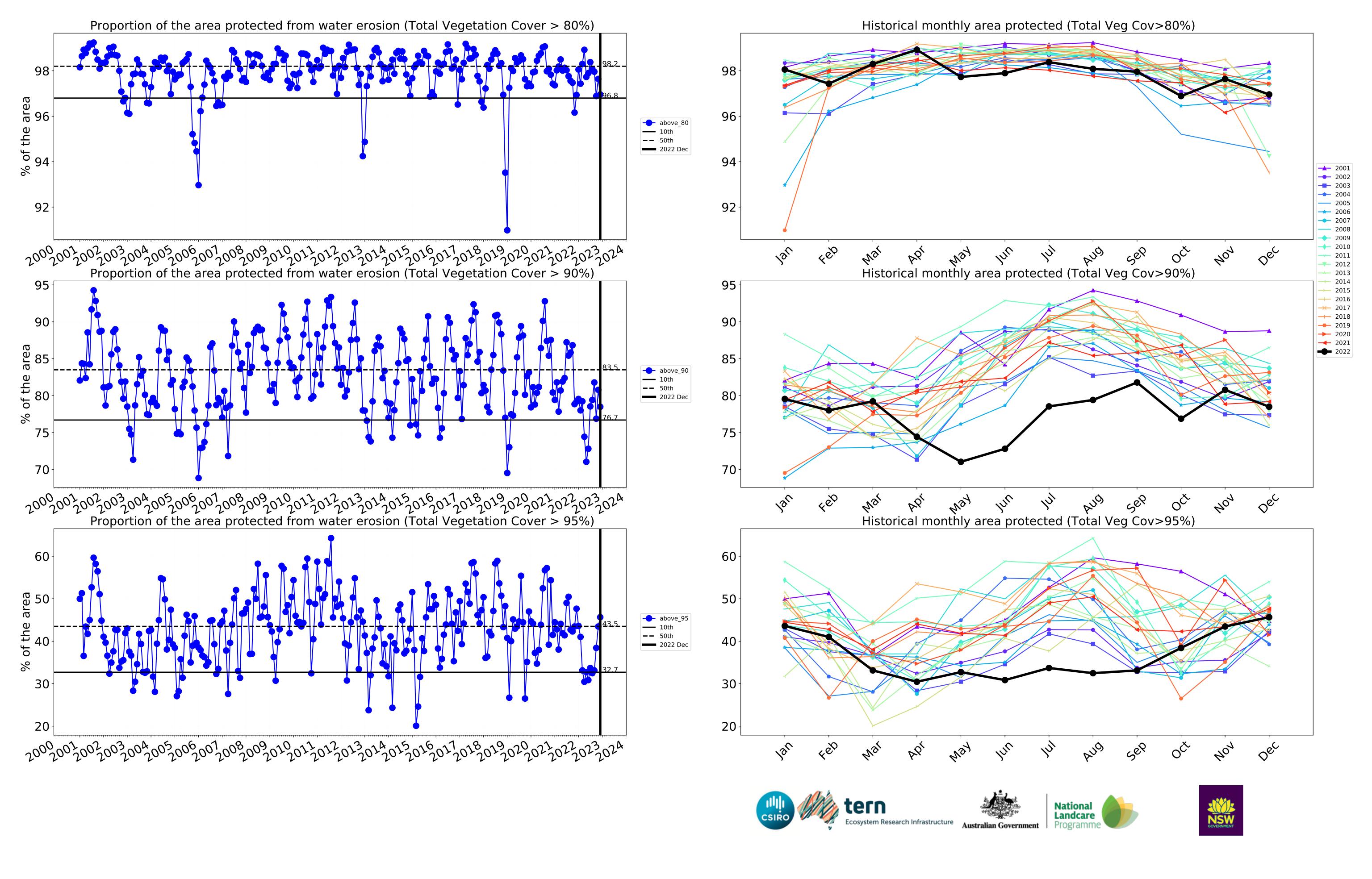
# **Conservation and natural environments timeseries**







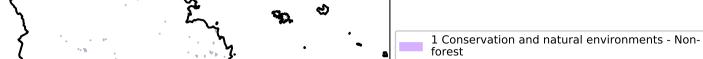




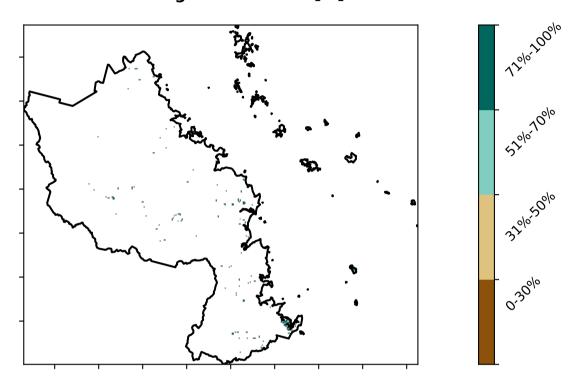
# **Conservation and natural environments non forest**

# Land use and forest cover

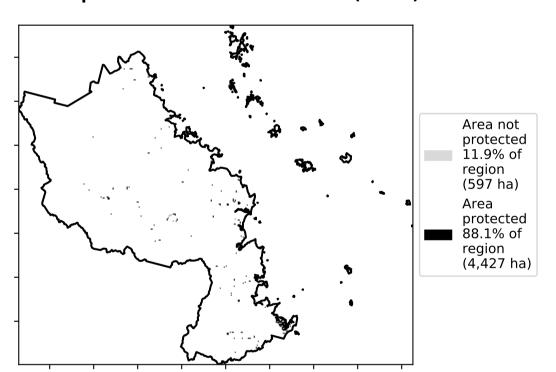
Catchment Scale
Land Use and Forests
of Australia (2018)
Derived from
Catchment Scale Land
Use of Australia
(2018) and Forests
of Australia (2018)



# **Total Vegetation Cover [%]**



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



# Total Vegetation Cover Anomaly [%]

Anomaly show how many percetage points each pixel is from

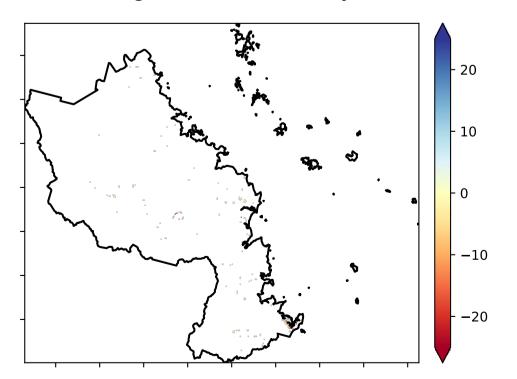
the mean. That

pixel. The mean

using baseline from 2001 to 2019.

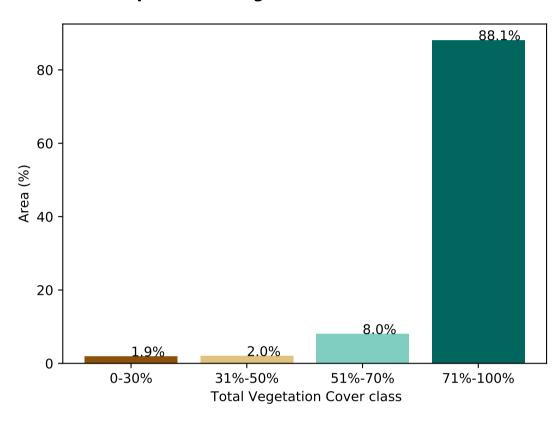
is only for the month of the map

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

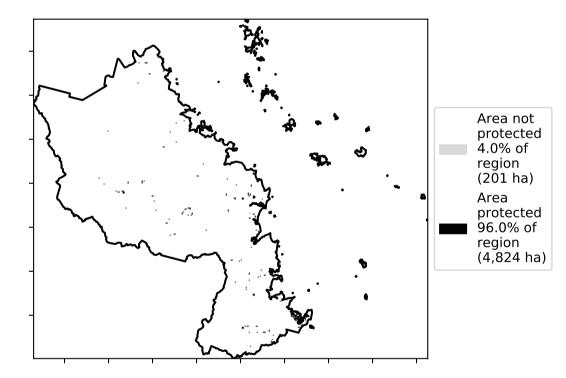


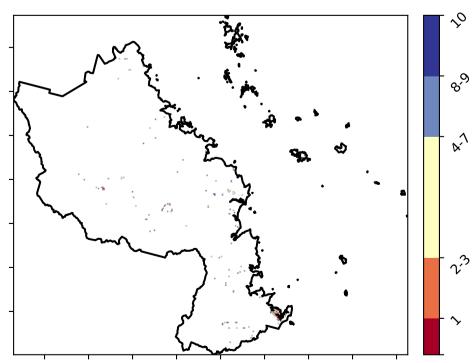
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

# Proportion of vegetation cover class in area



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





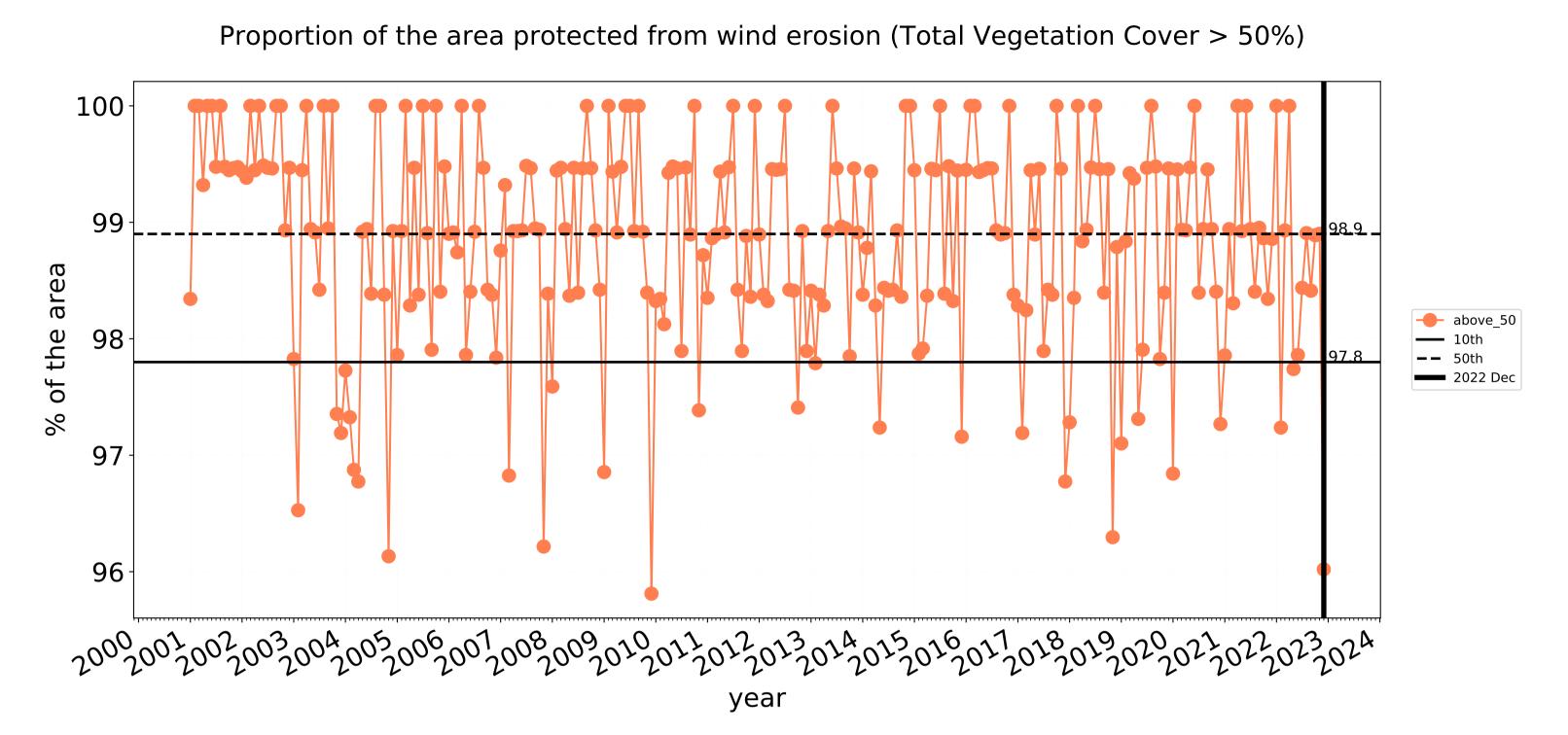


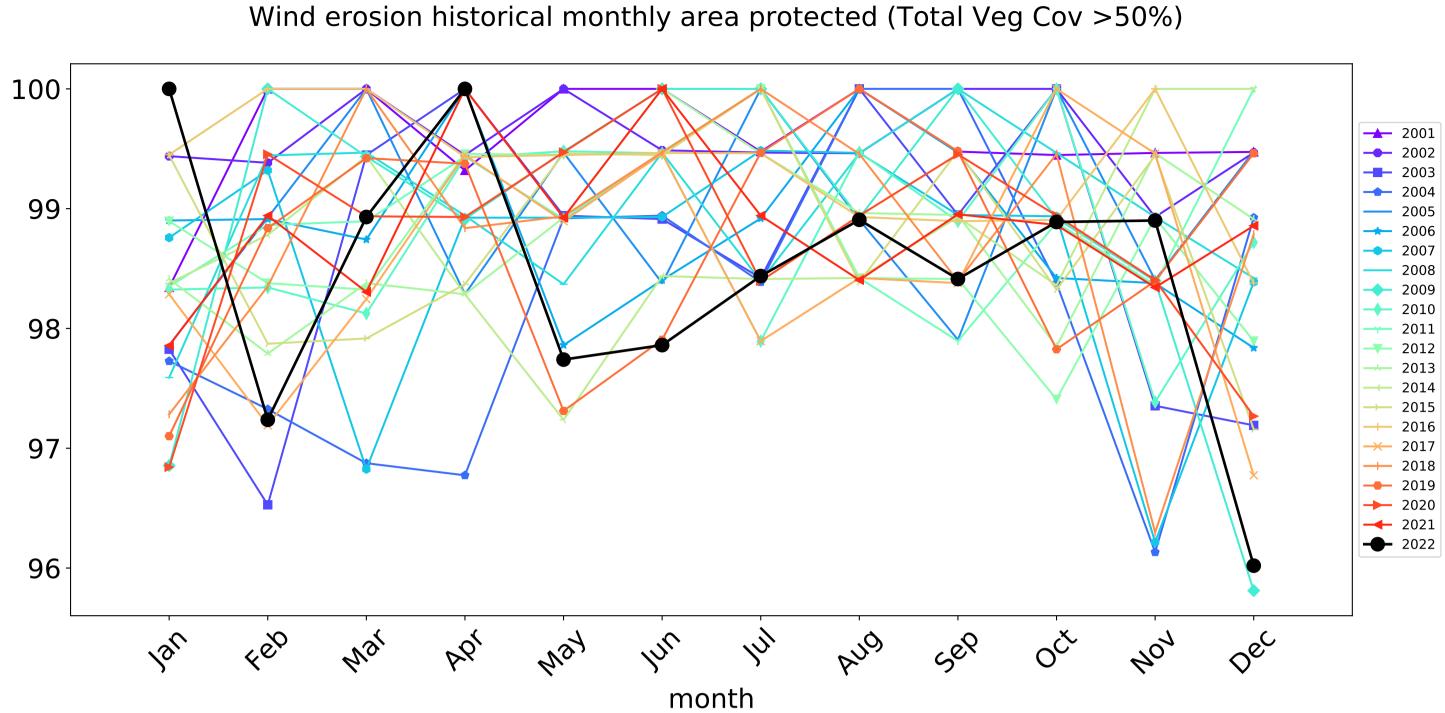


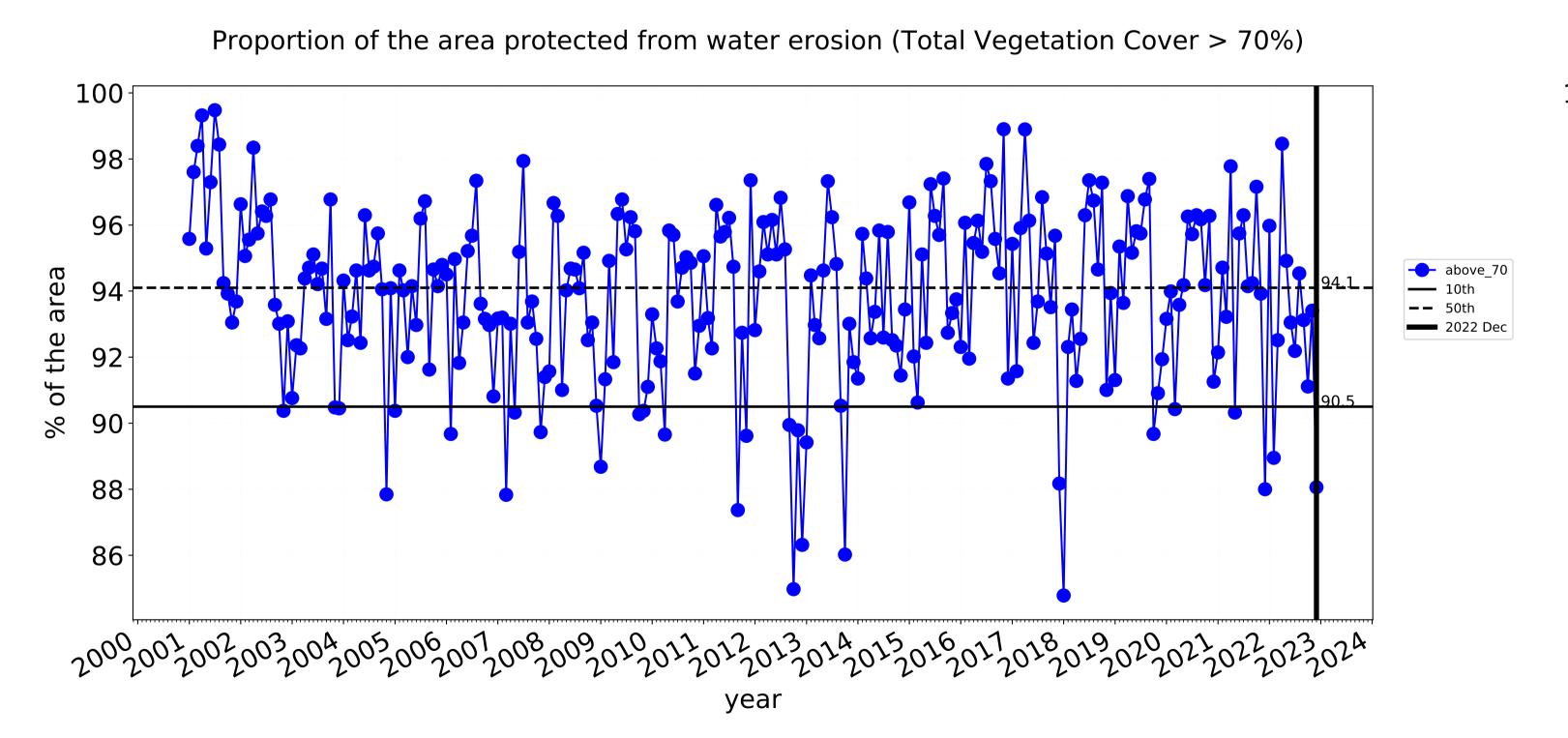


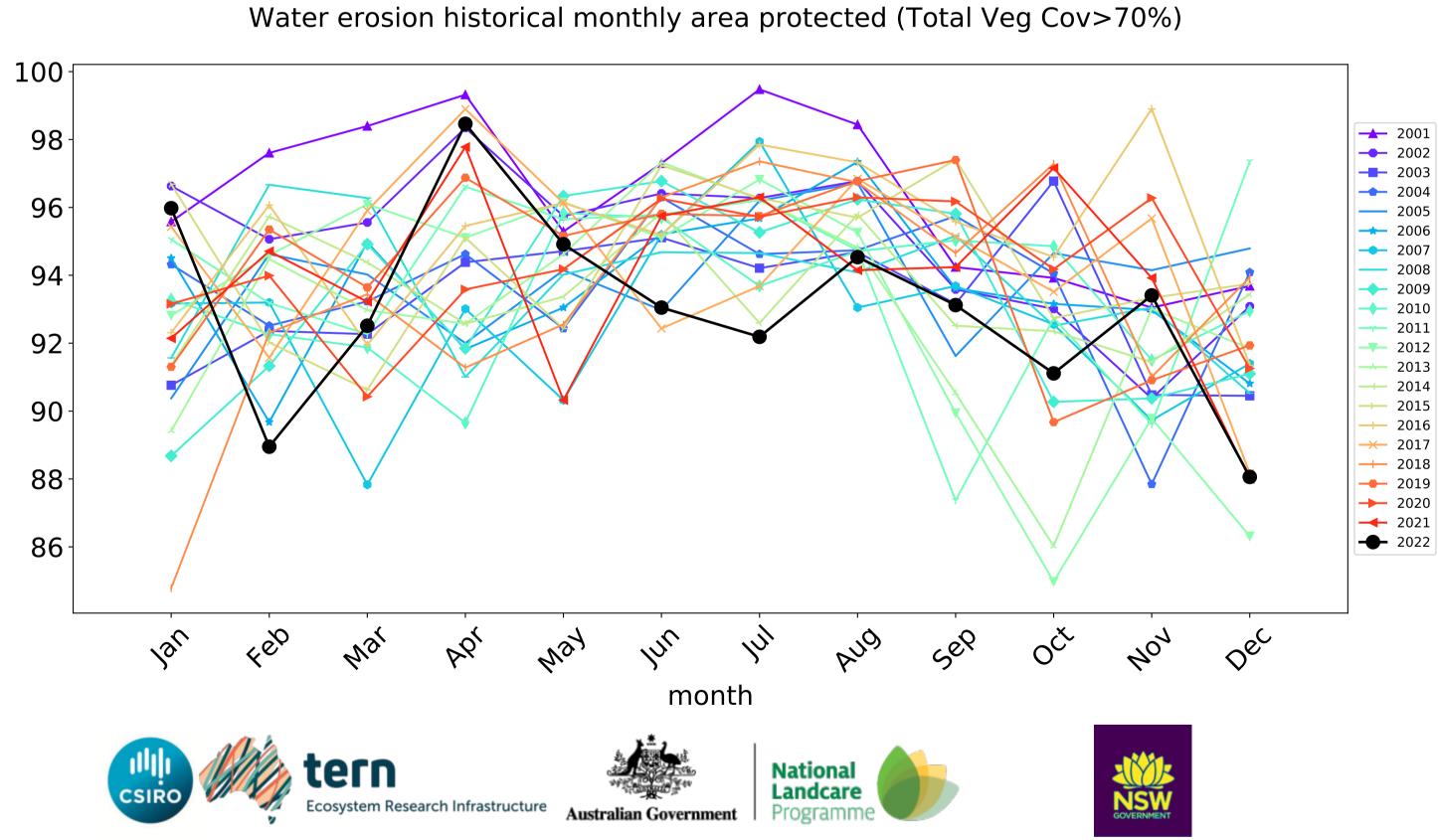


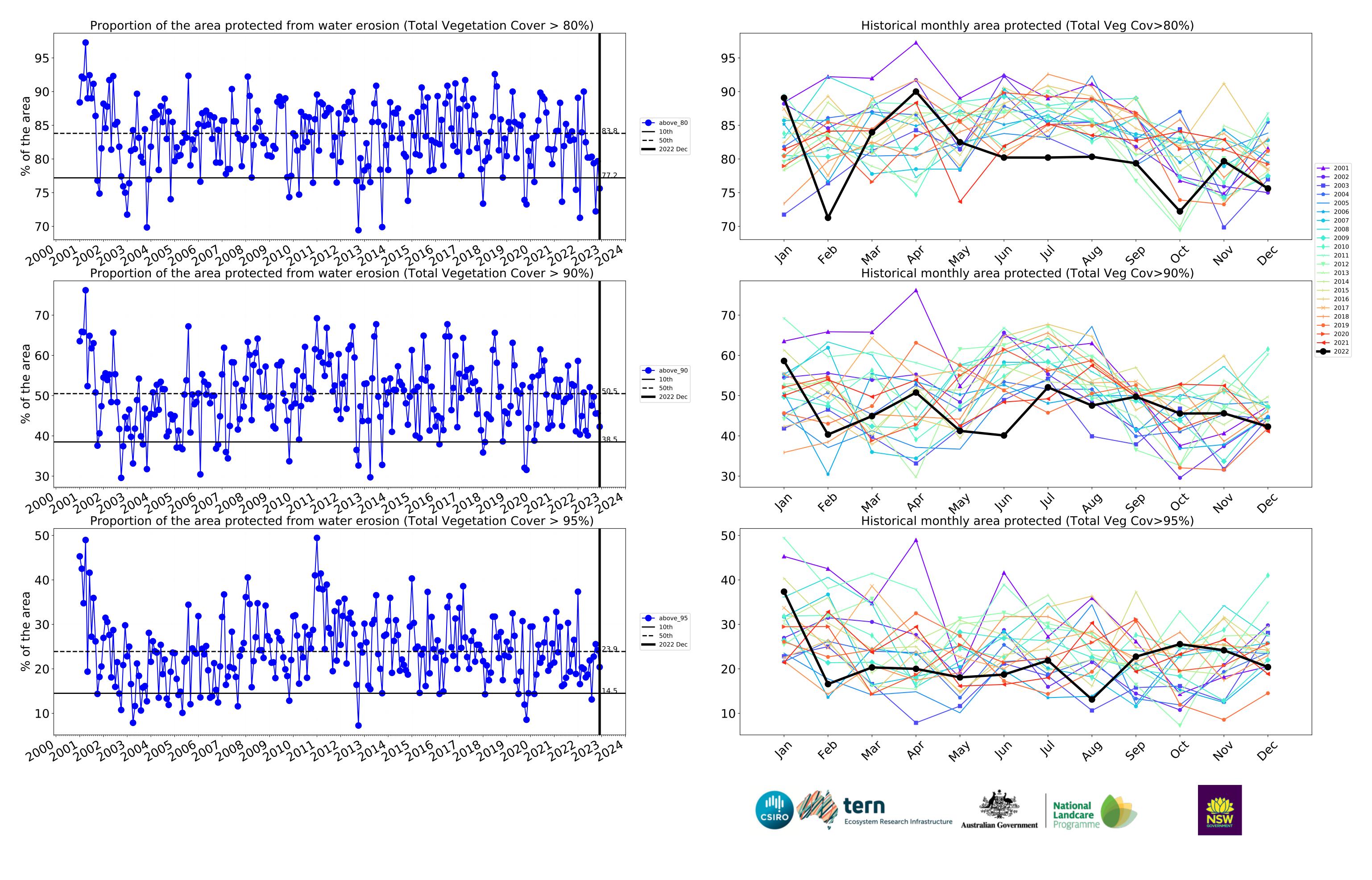
# **Conservation and natural environments non forest timeseries**











# **Conservation and natural environments Woodland forest**

# Land use and forest cover 1 Conservation and natural environments - Woodland

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

Catchment Scale Land Use and Forests of Australia (2018)

Catchment Scale Land

Derived from

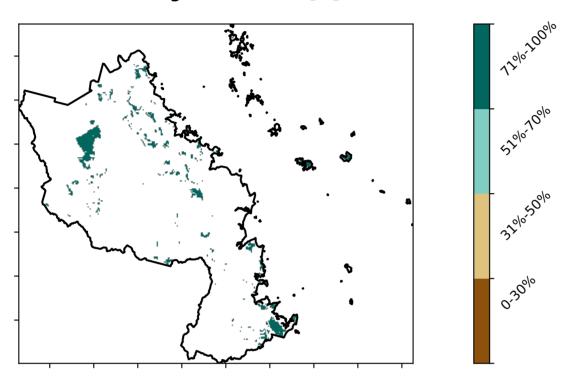
the mean. That

is, red pixels are about 20% lower than the

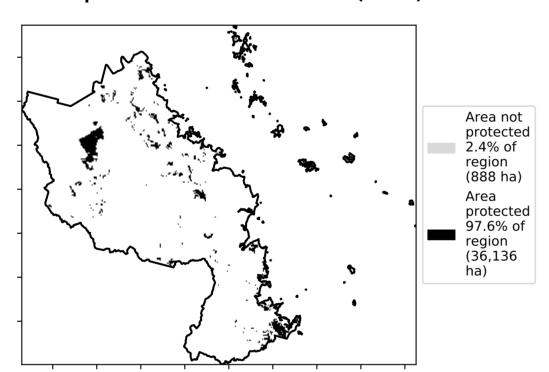
mean of that pixel. The mean is only for the month of the map

using baseline from 2001 to 2019.

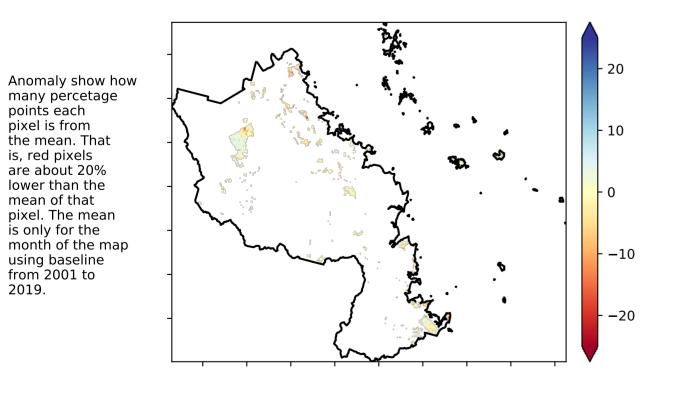
**Total Vegetation Cover [%]** 



% Area protected from water erosion (>70%)

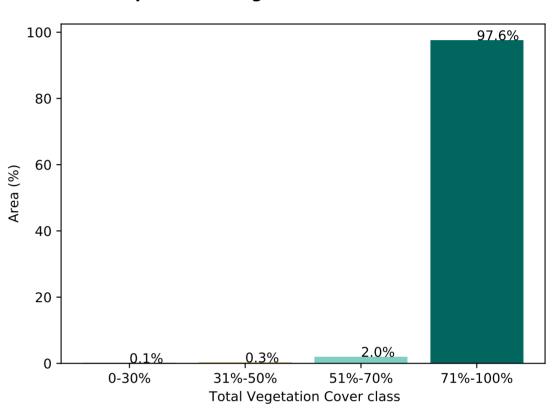


**Total Vegetation Cover Anomaly [%]** 

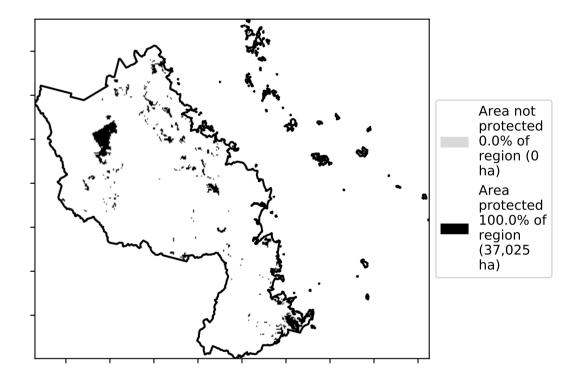


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

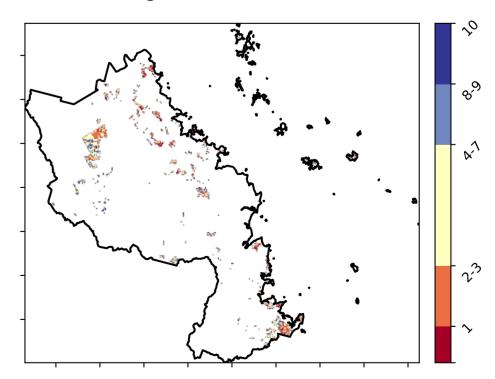
# Proportion of vegetation cover class in area



% Area protected from wind erosion (>50%)



**Total Vegetation Cover Decile [%]** 



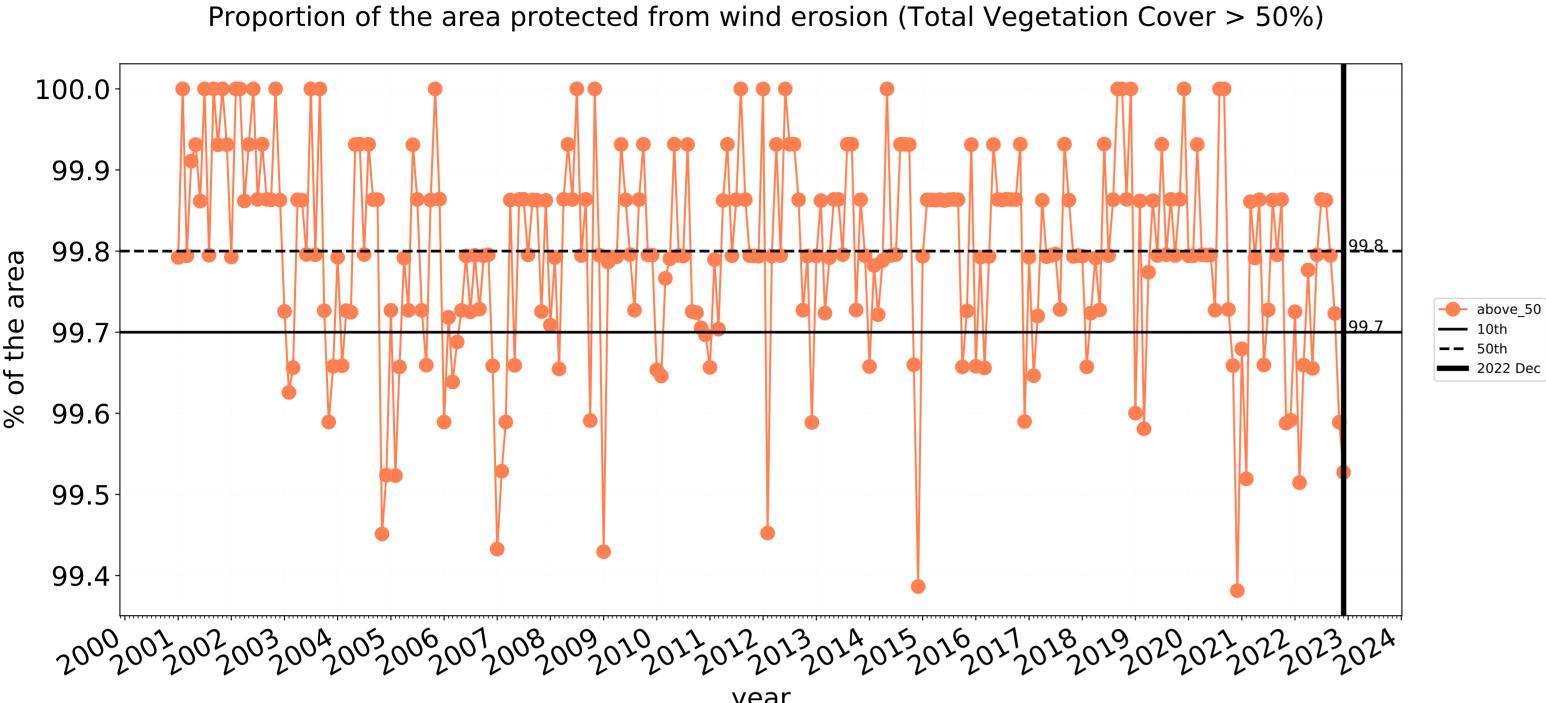


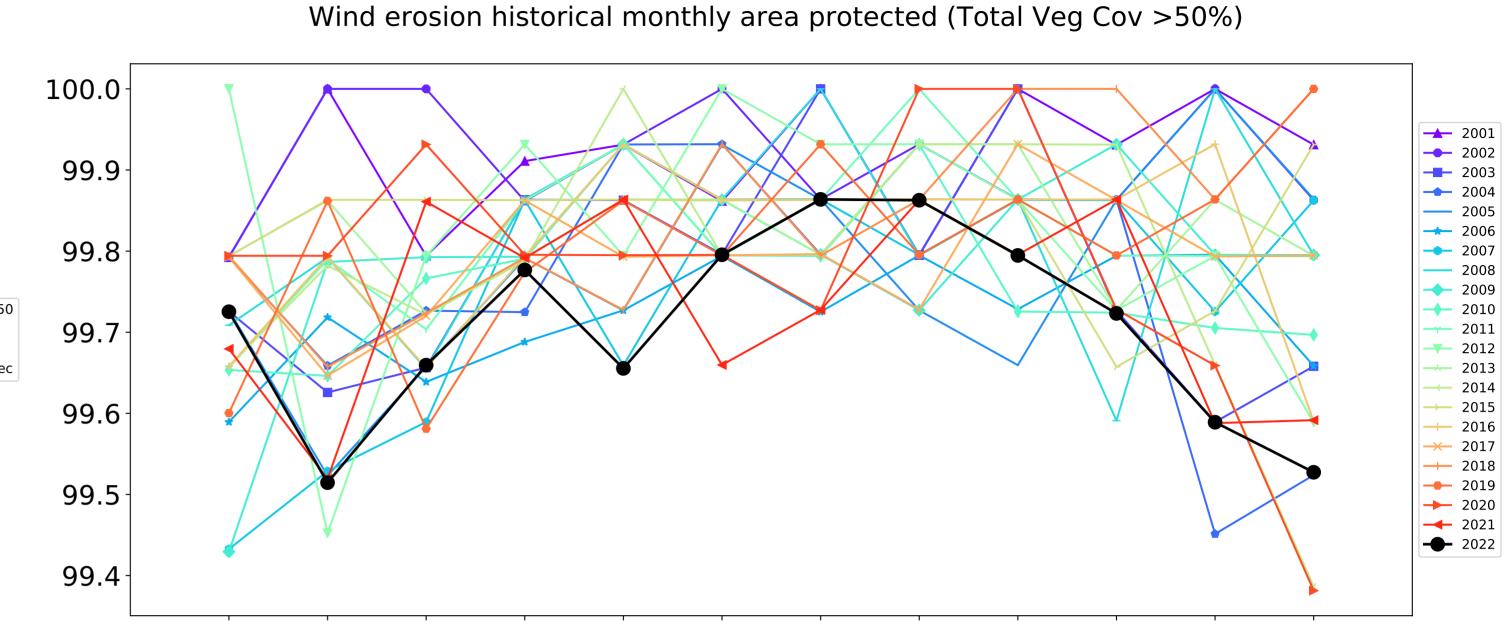




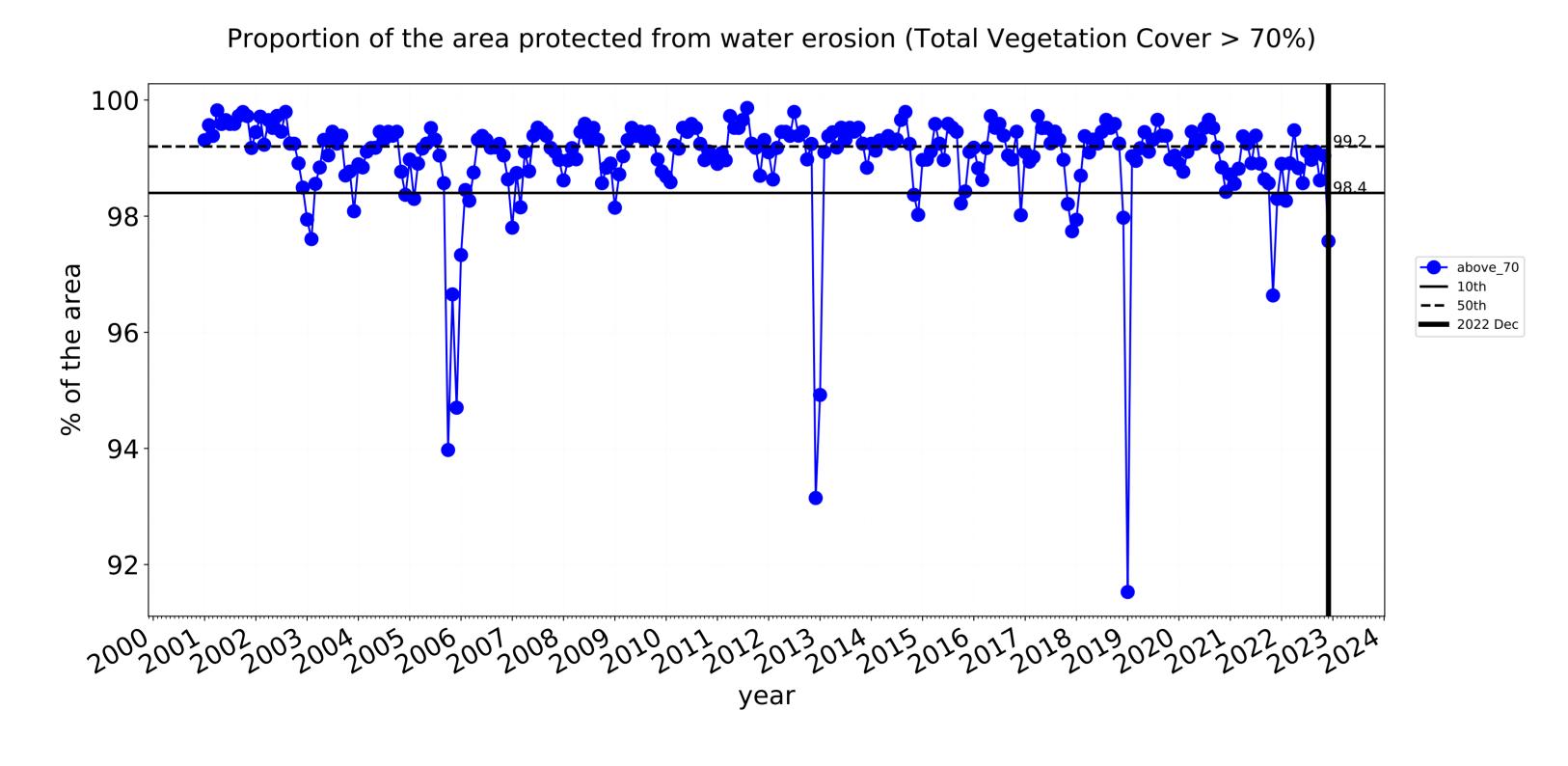


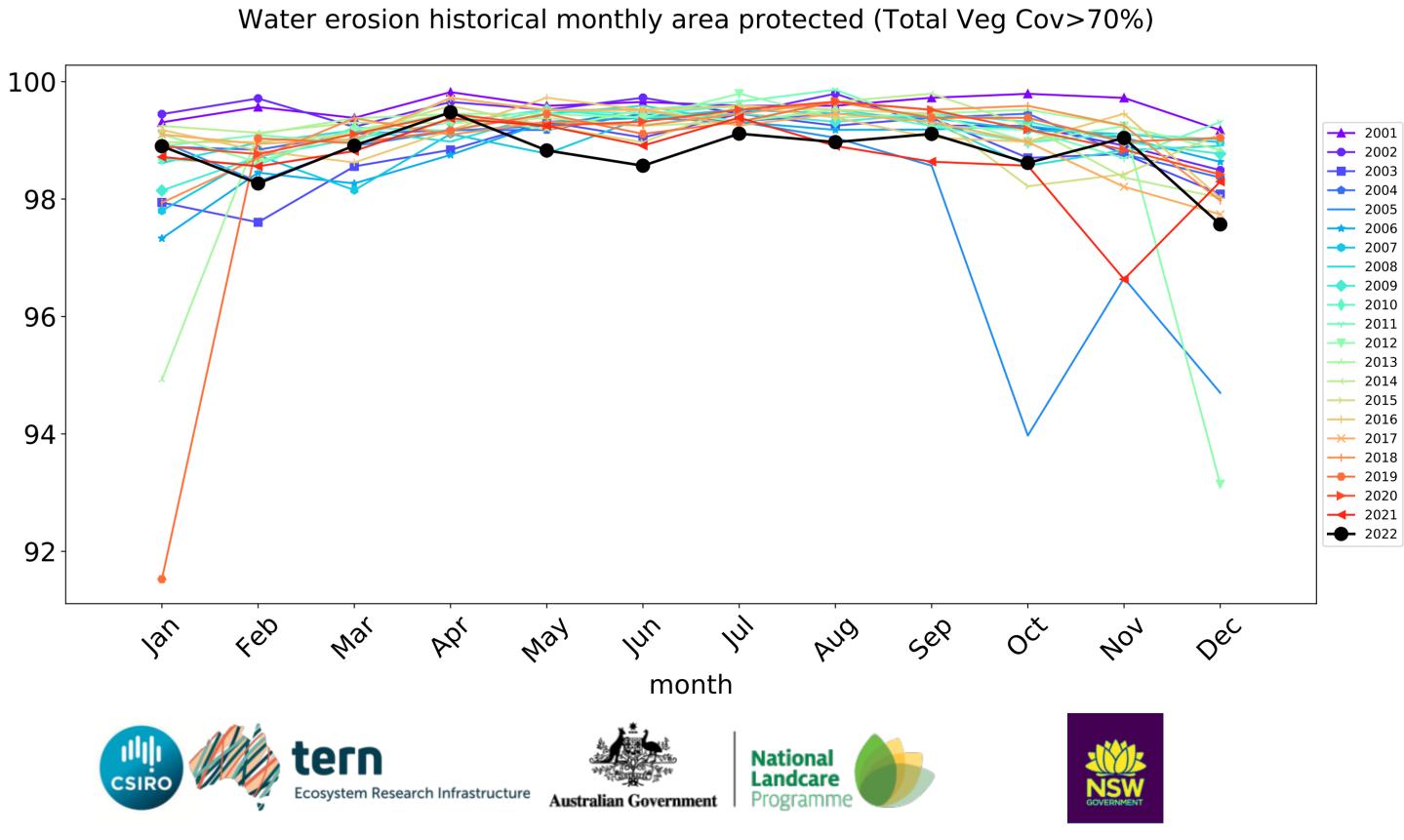
# **Conservation and natural environments Woodland forest timeseries**

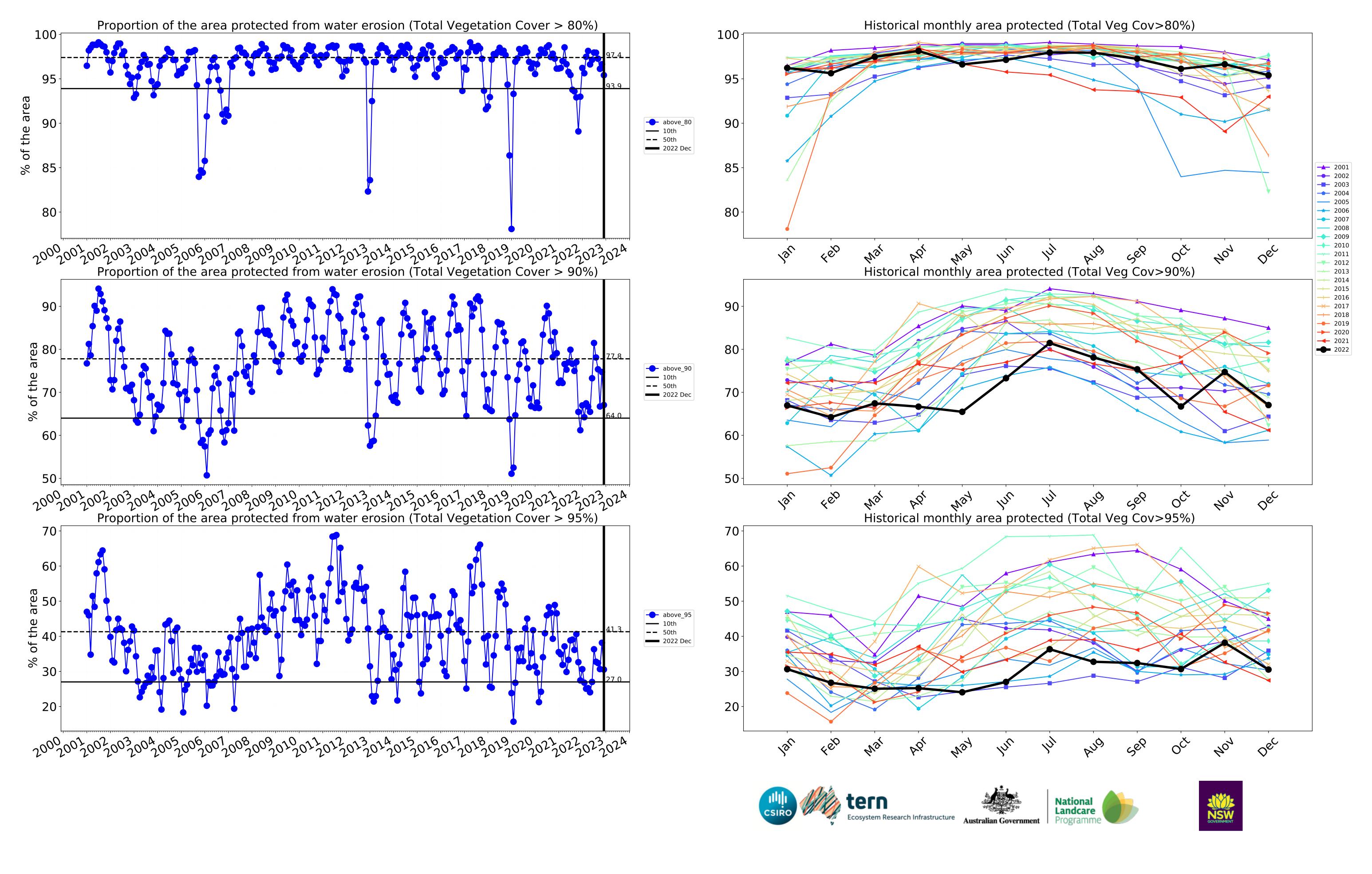




month

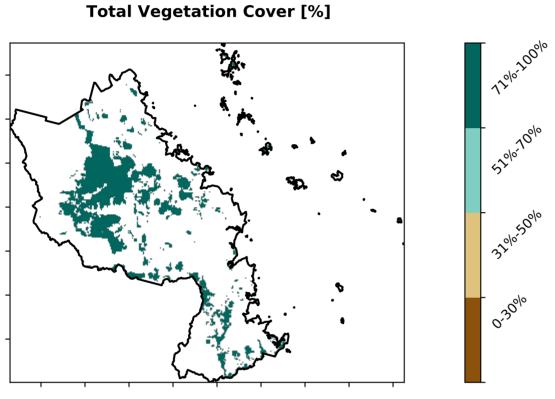




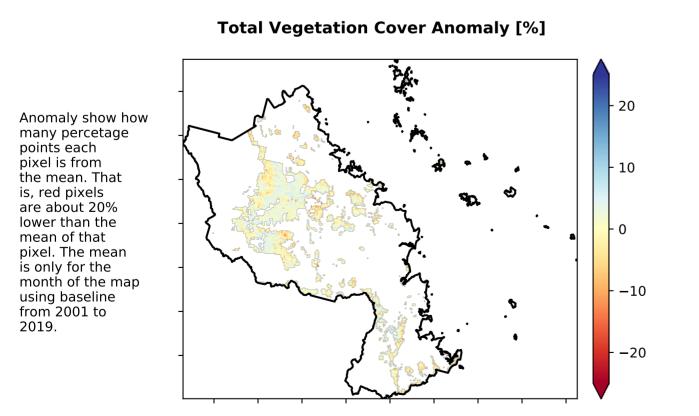


# **Conservation and natural environments Forest (non woodland)**

# Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from 1 Conservation and natural environments - Non-woodland forest Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

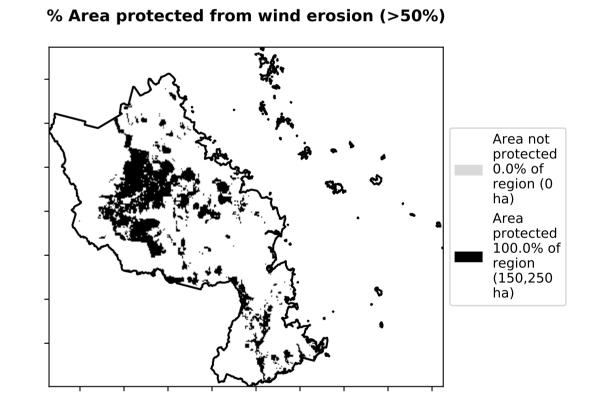


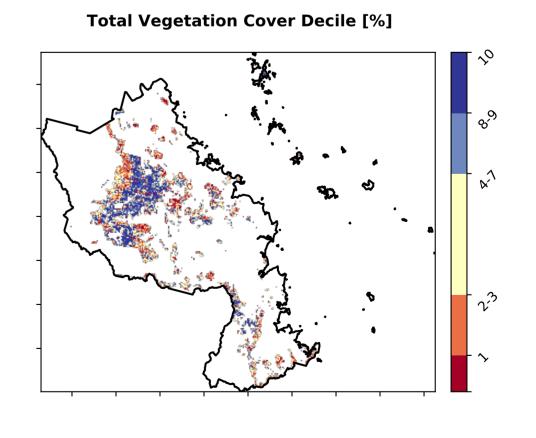
# % Area protected from water erosion (>70%) Area not protected 0.8% of region (1,202 ha) Area protected 99.2% of region (149,048 ha)



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 man using baseline. the map using baseline from 2001 to 2019.

# Proportion of vegetation cover class in area 99.2% 100 80 20 -0-30% 31%-50% 51%-70% 71%-100% **Total Vegetation Cover class**



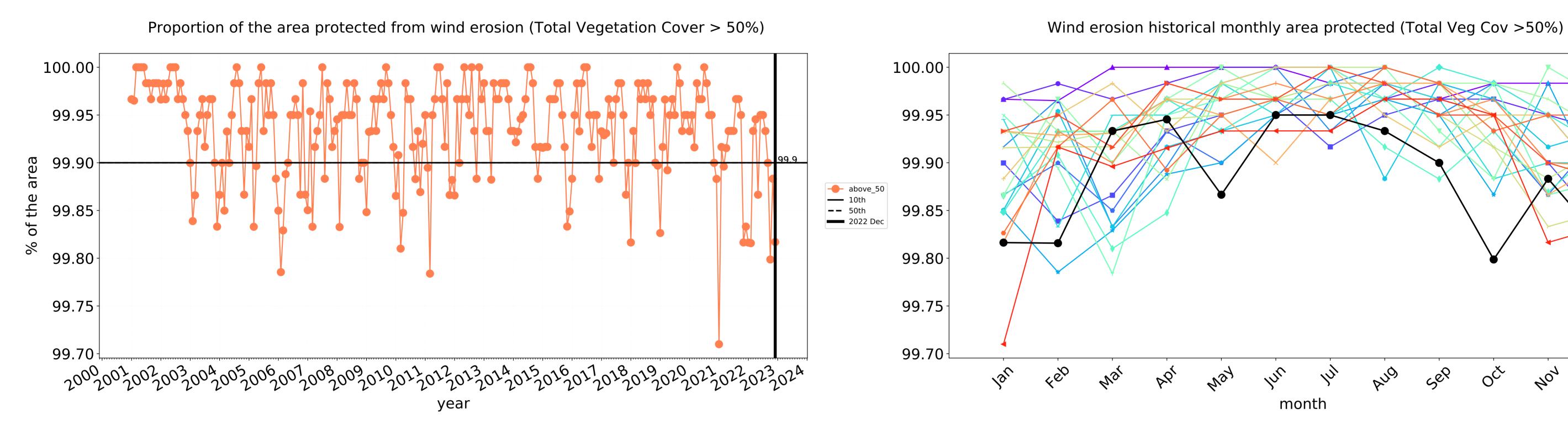


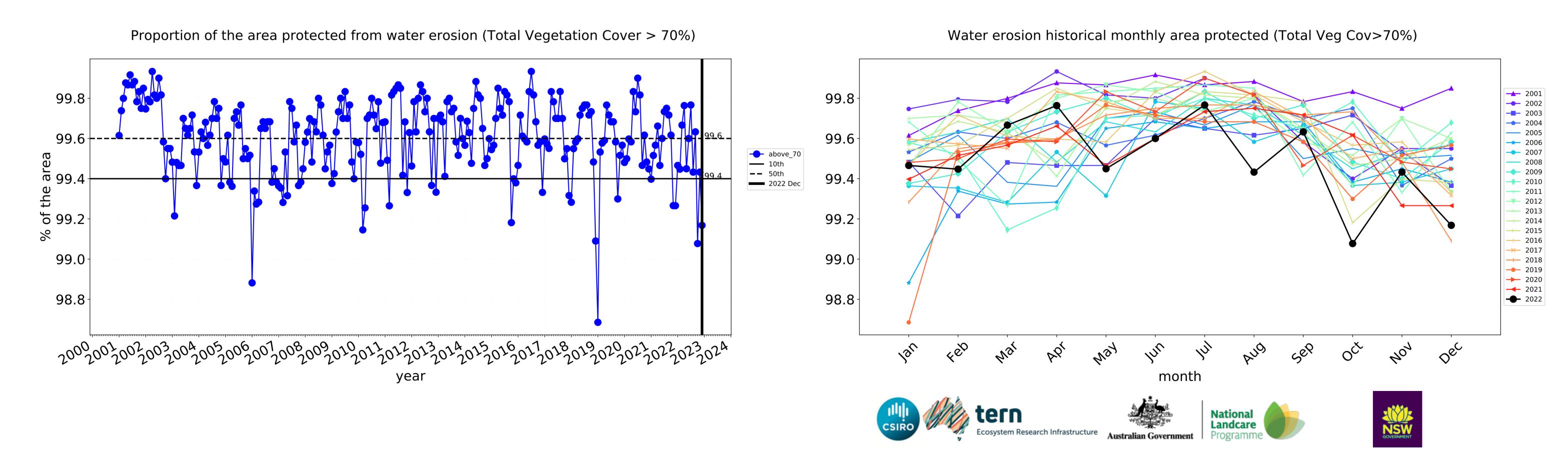












2004

<del>----</del> 2007

2011

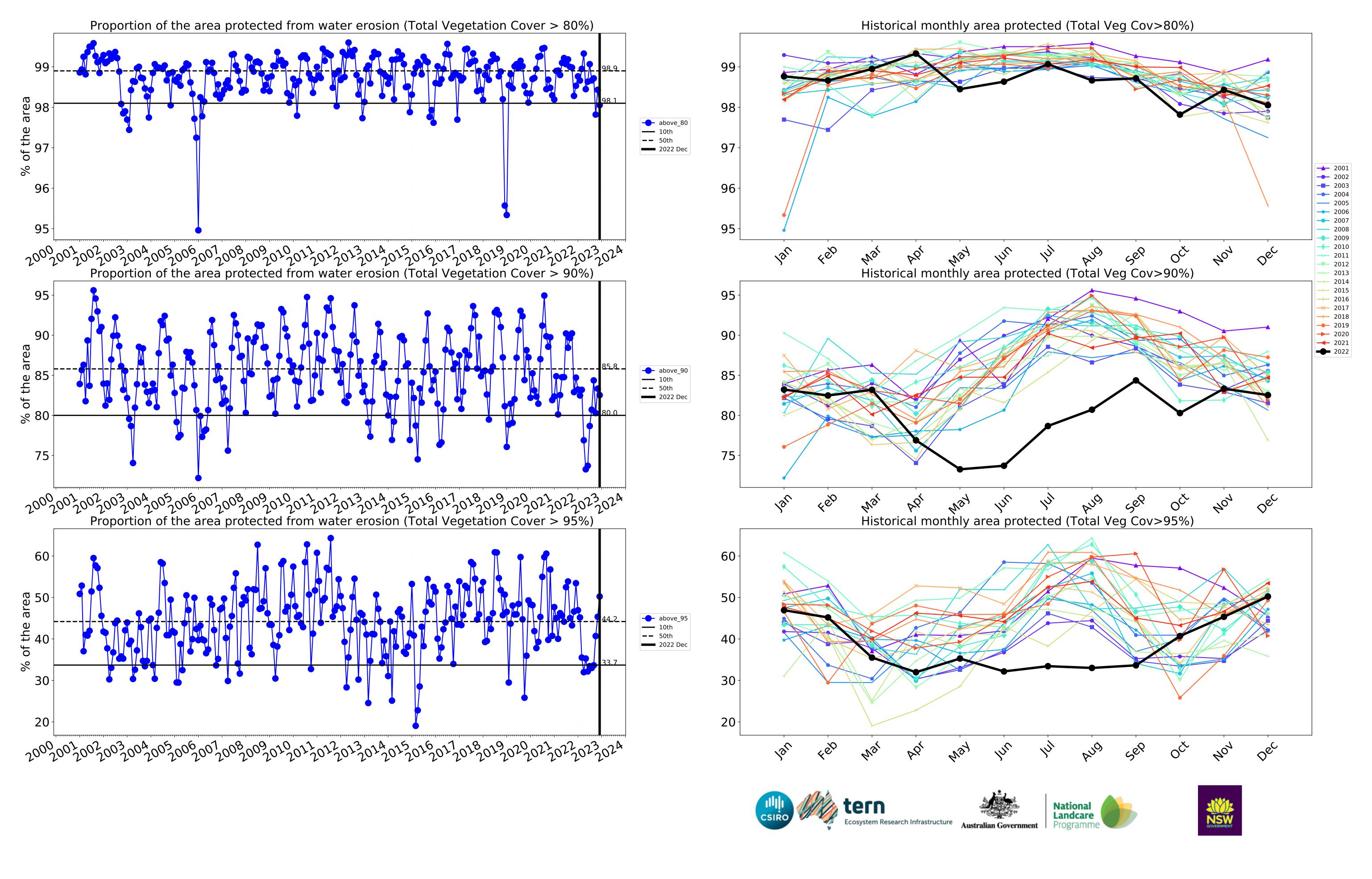
2013

→ 2014 → 2015

→ 2016 → 2017

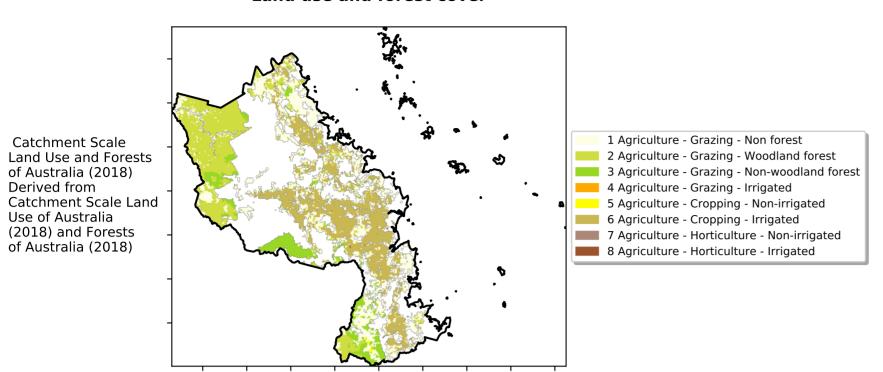
2018 2019 2020

2021 2022

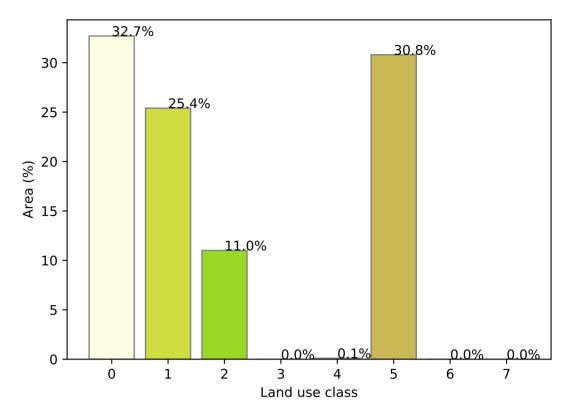


# **Agriculture**

# Land use and forest cover



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



# **Total Vegetation Cover [%]**

of Australia (2018)

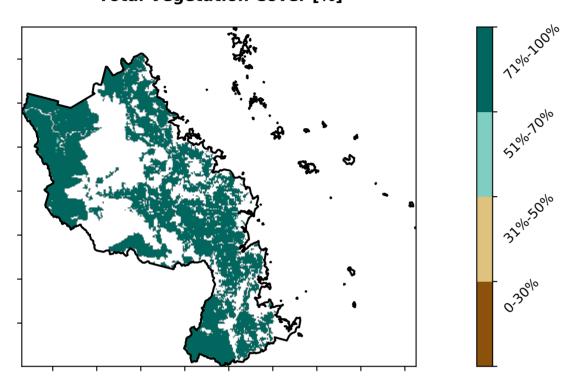
the mean. That

pixel. The mean

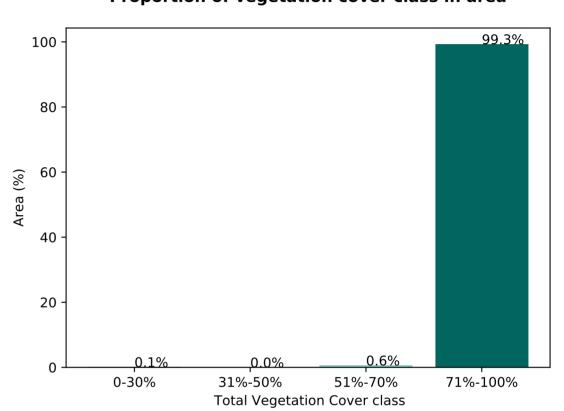
using baseline from 2001 to 2019.

is only for the month of the map

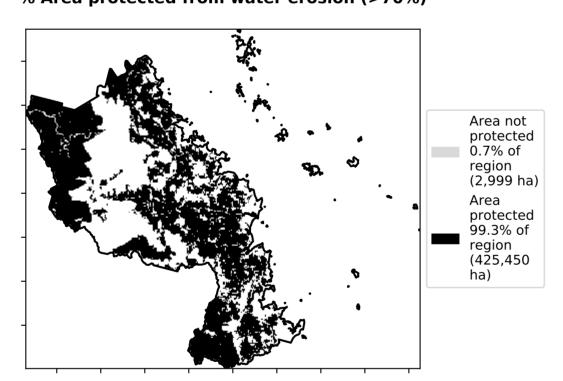
is, red pixels are about 20% lower than the mean of that



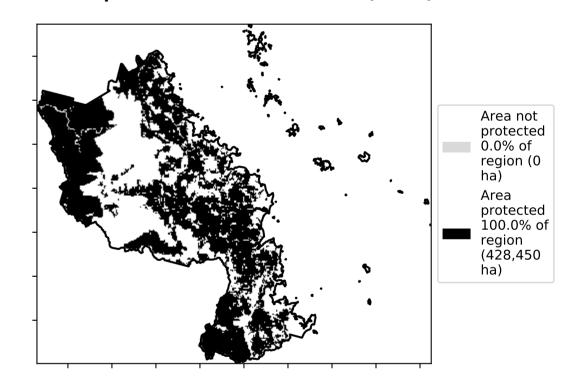
Proportion of vegetation cover class in area



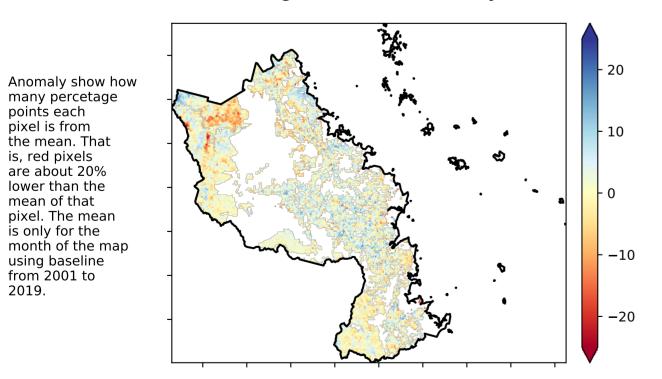
# % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

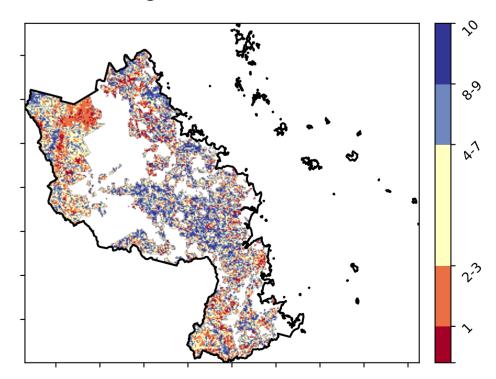


# **Total Vegetation Cover Anomaly [%]**



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

**Total Vegetation Cover Decile [%]** 



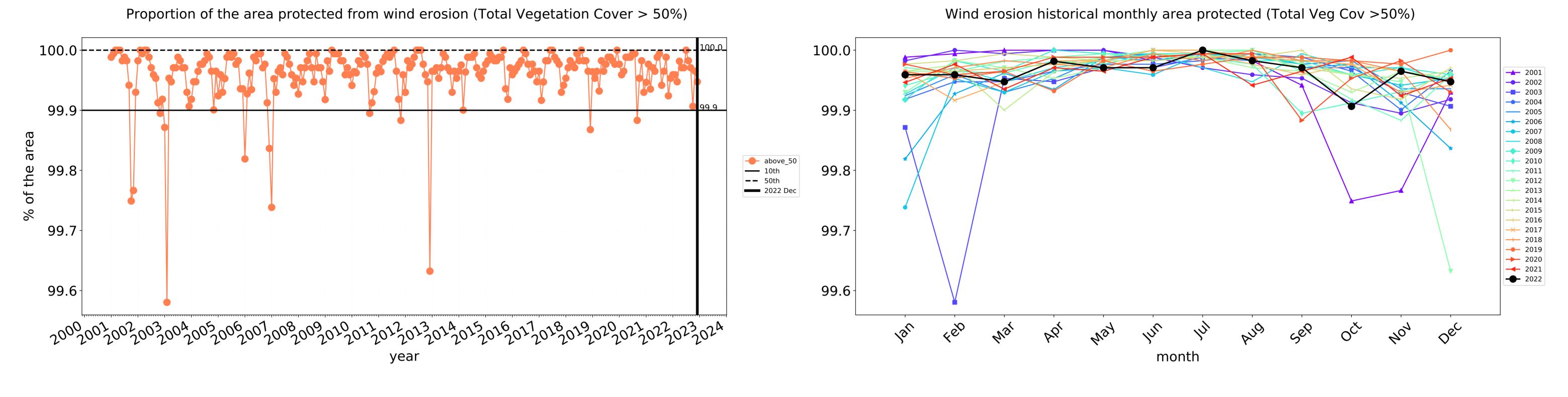


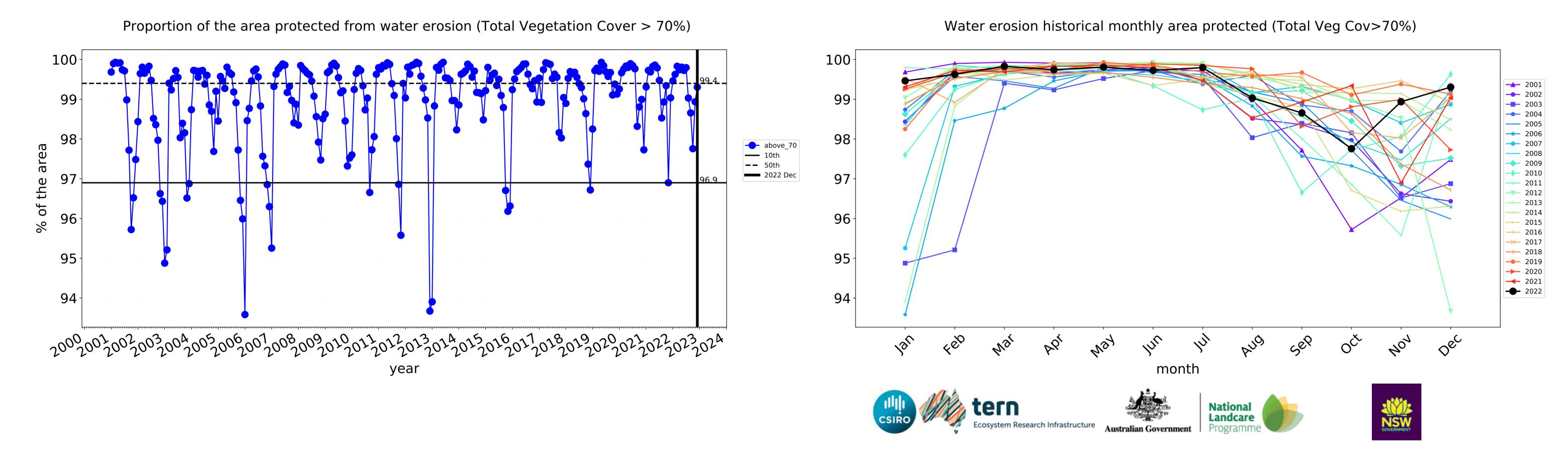


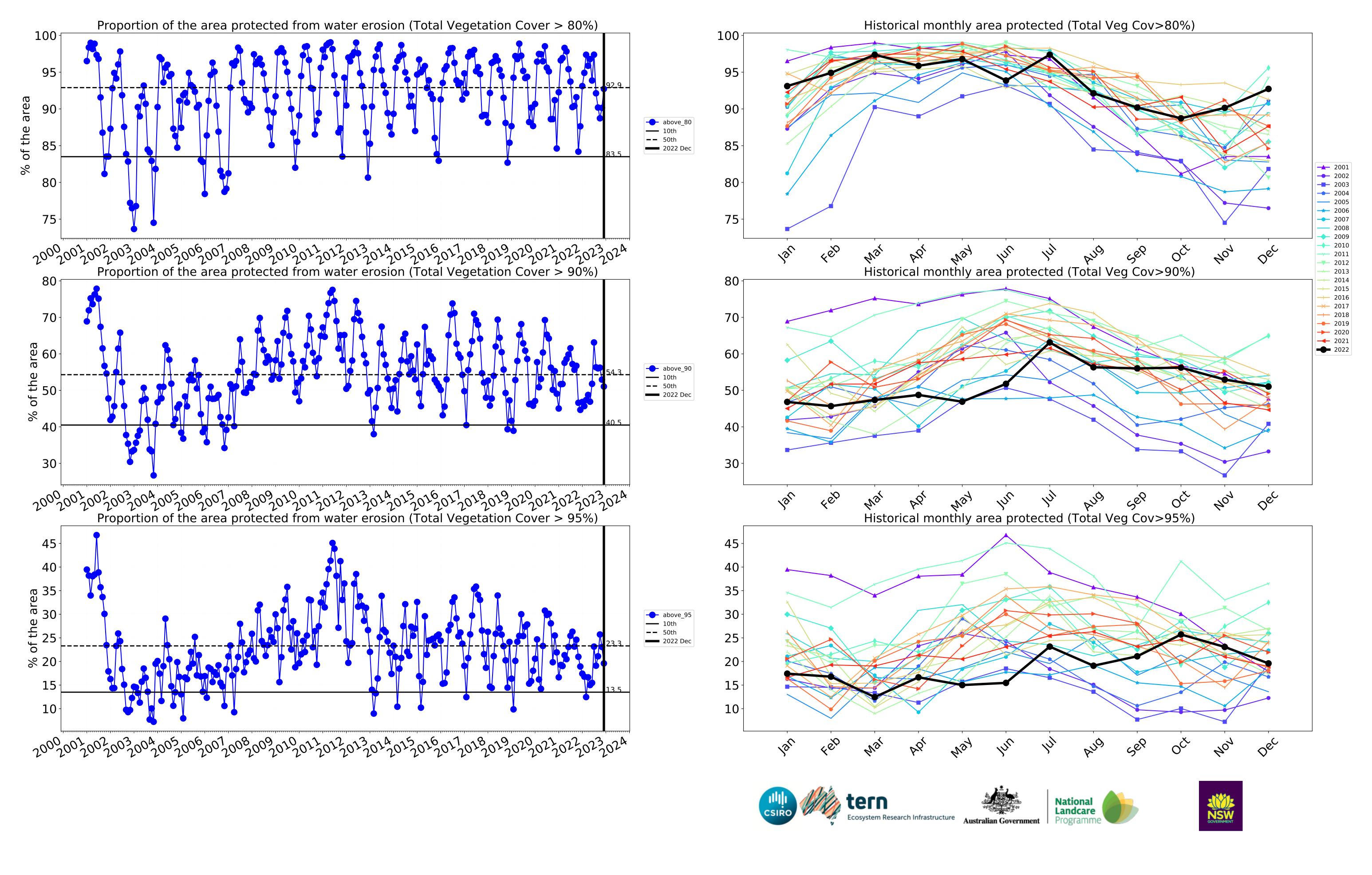




# **Agriculture timeseries**





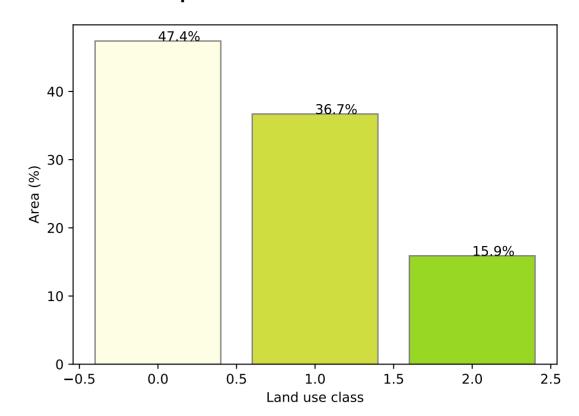


# **Grazing**

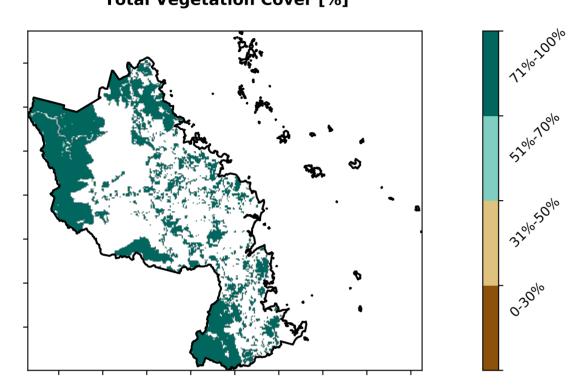
# Land use and forest cover

# 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

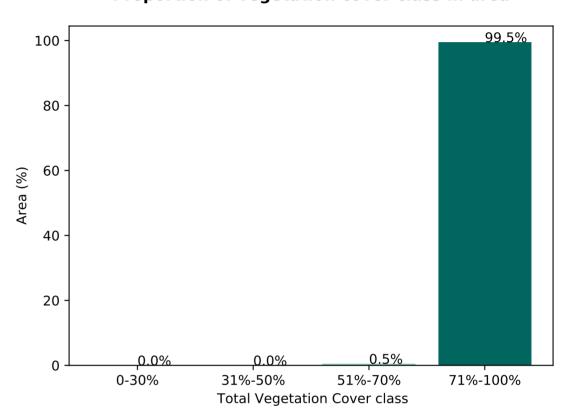
# **Proportion of each land class in area**

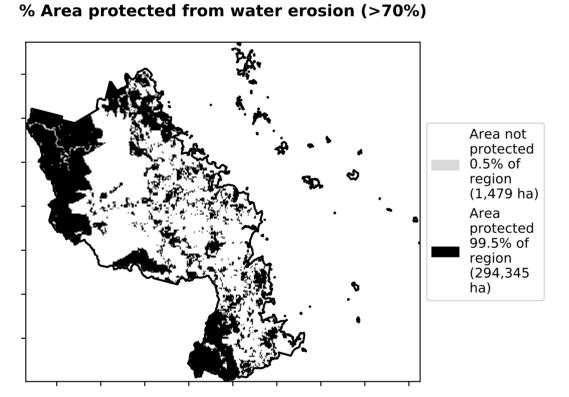


# **Total Vegetation Cover [%]**

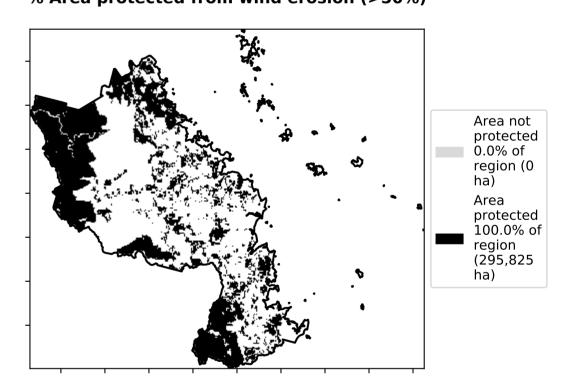


Proportion of vegetation cover class in area





% Area protected from wind erosion (>50%)

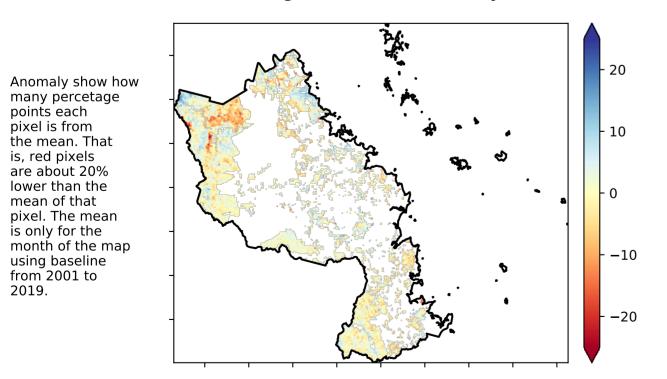


# **Total Vegetation Cover Anomaly [%]**

lower than the

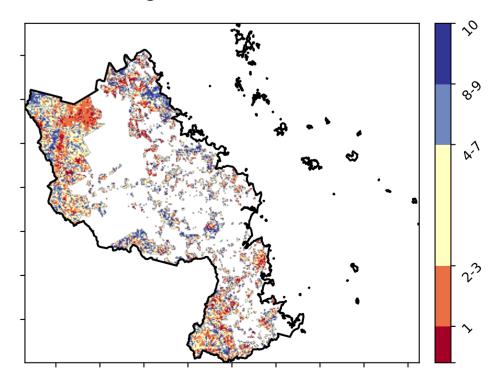
using baseline from 2001 to 2019.

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



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 [%]** 



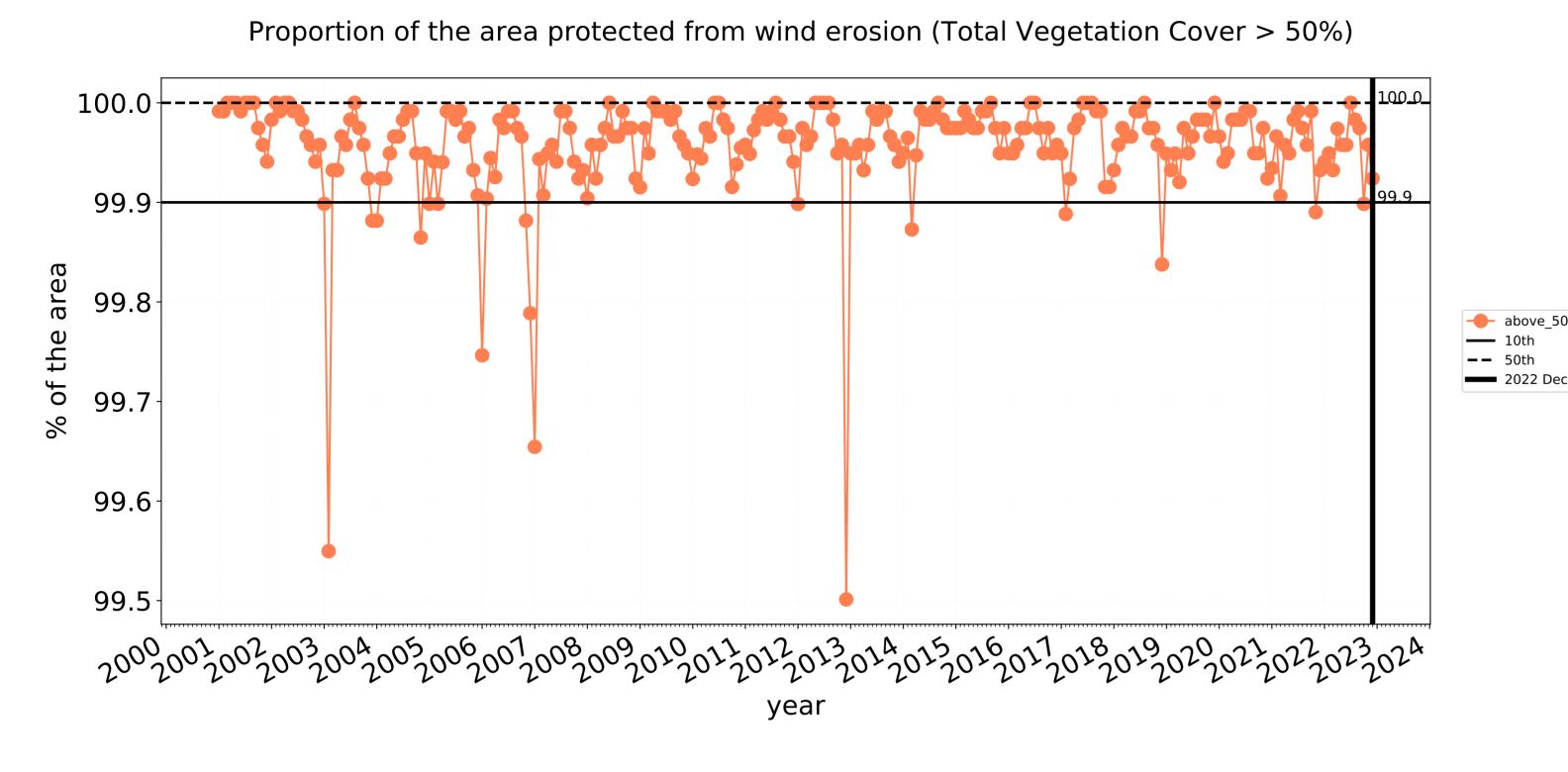


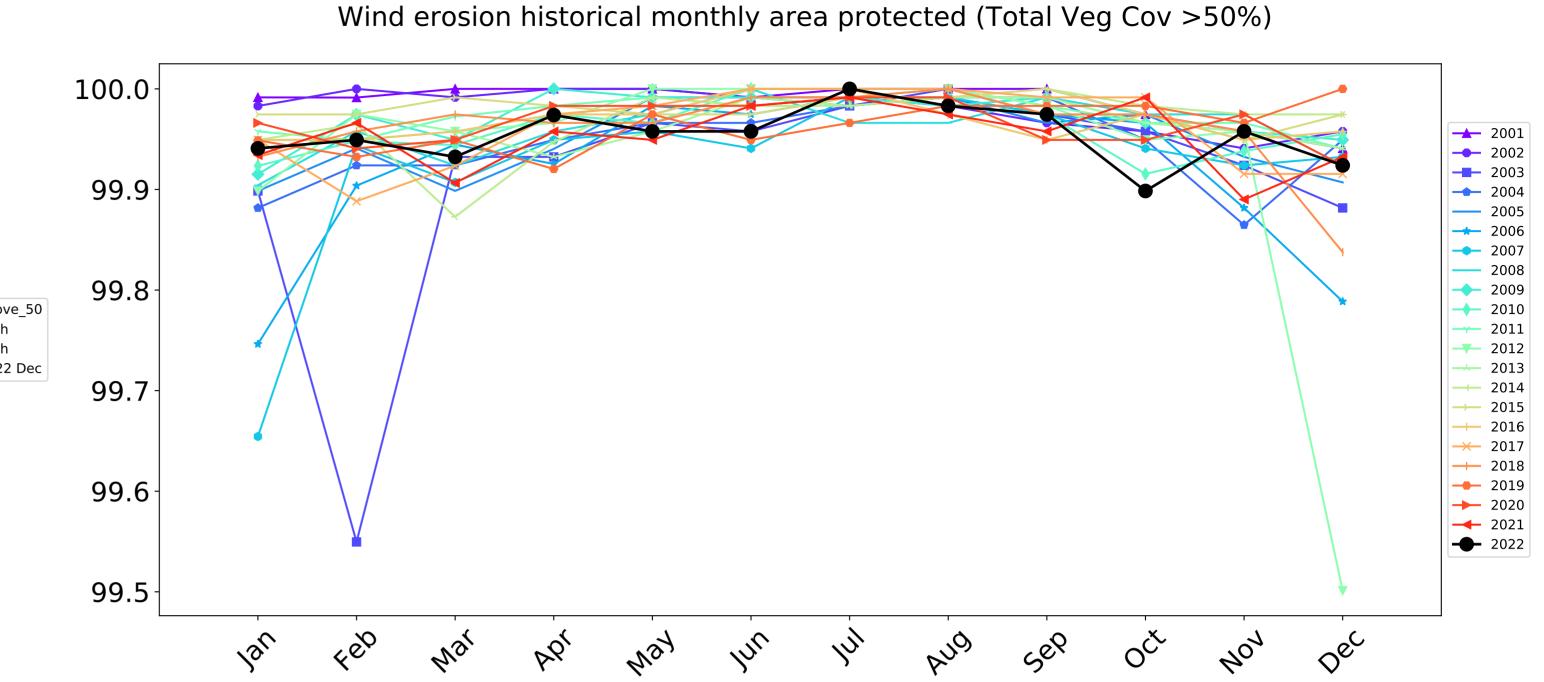






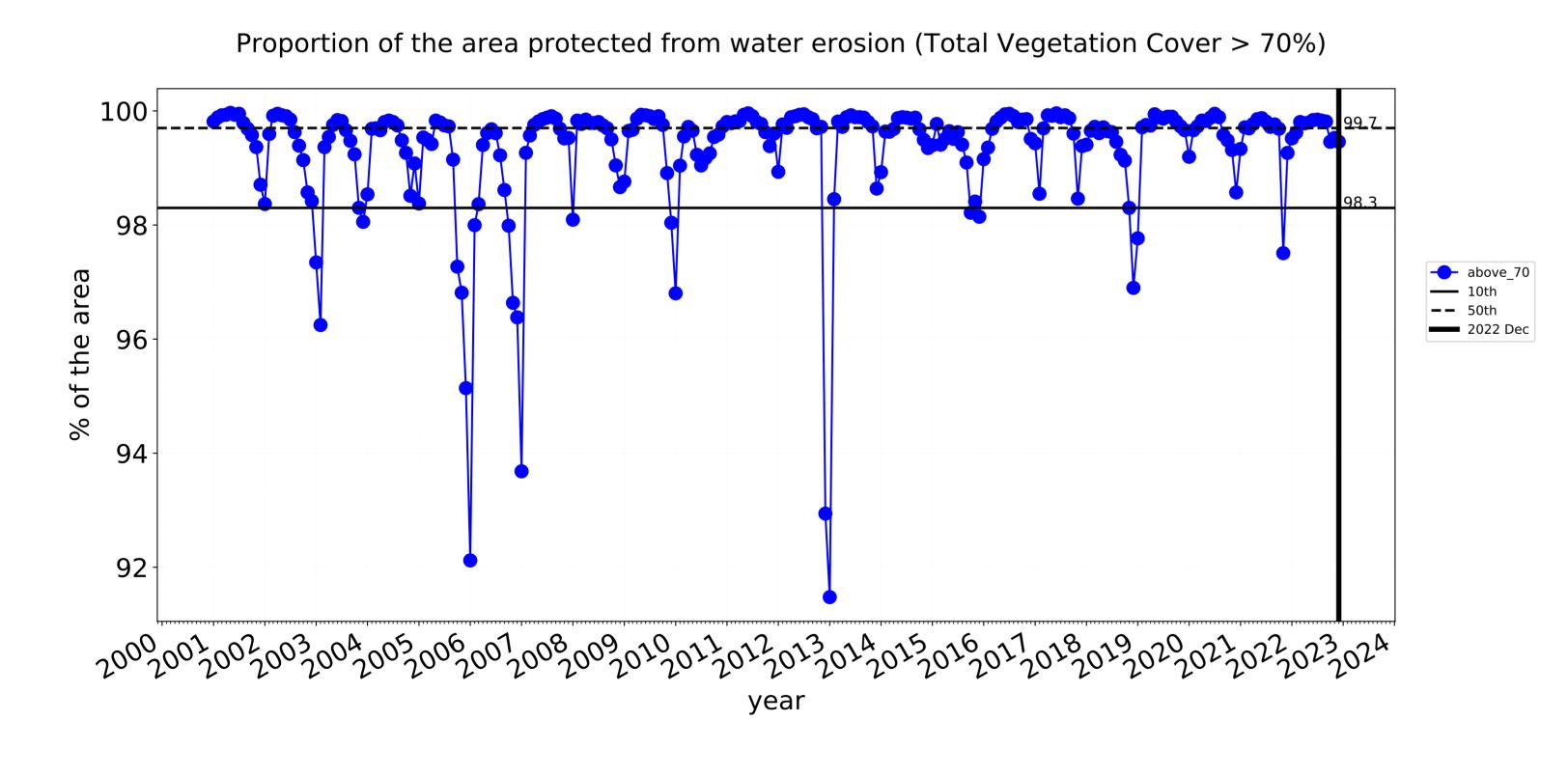
# **Grazing timeseries**

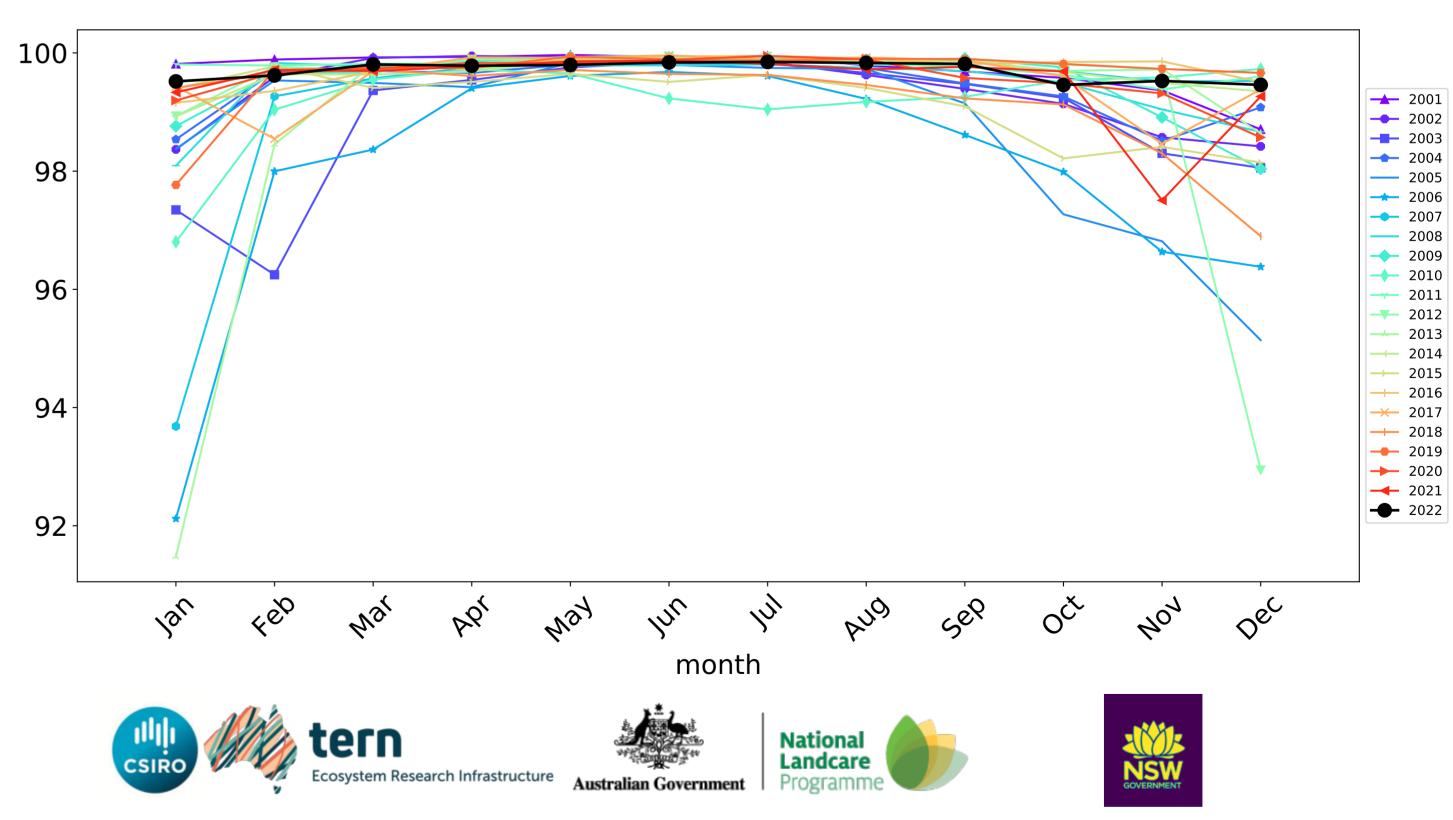


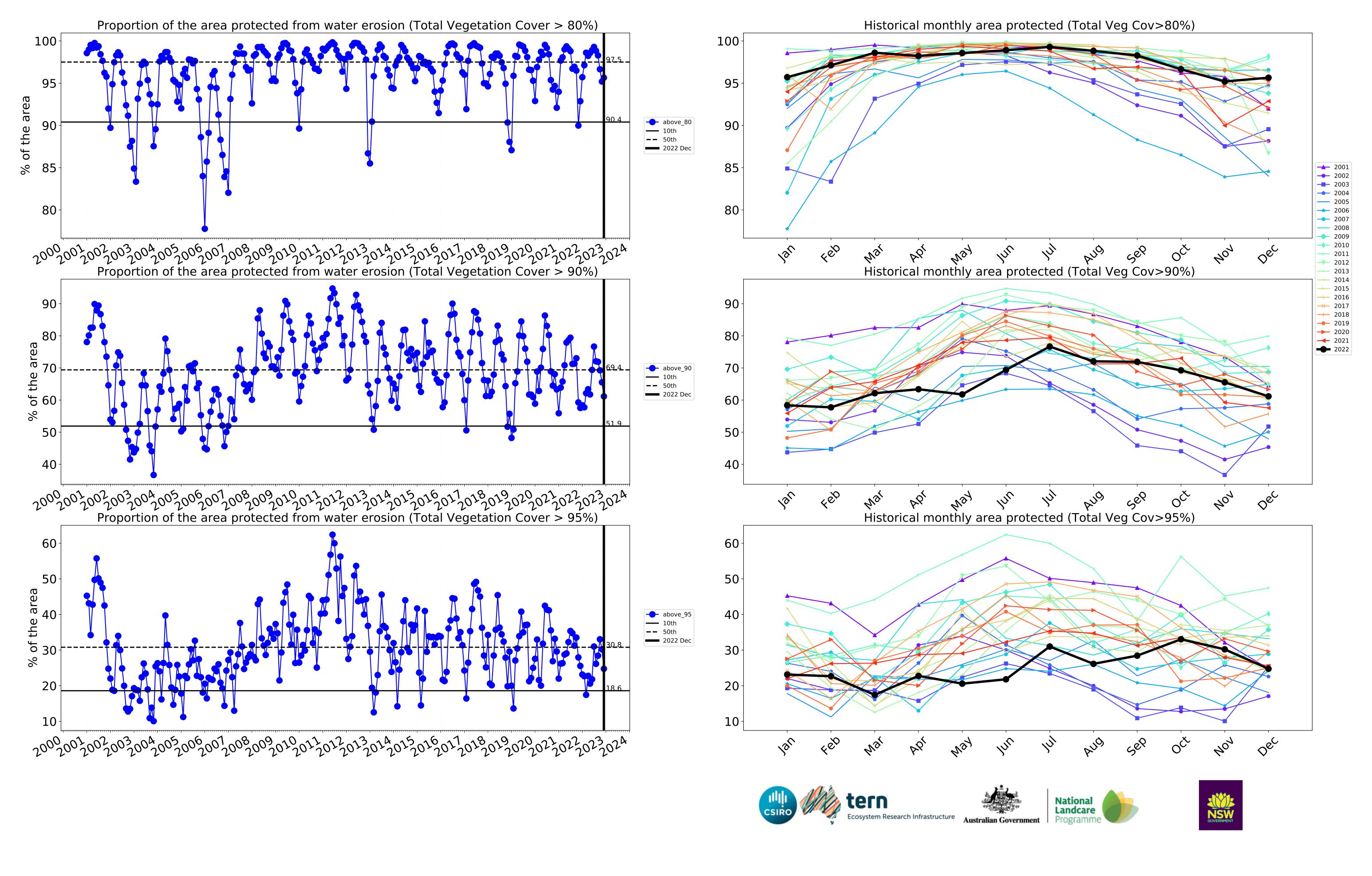


month

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





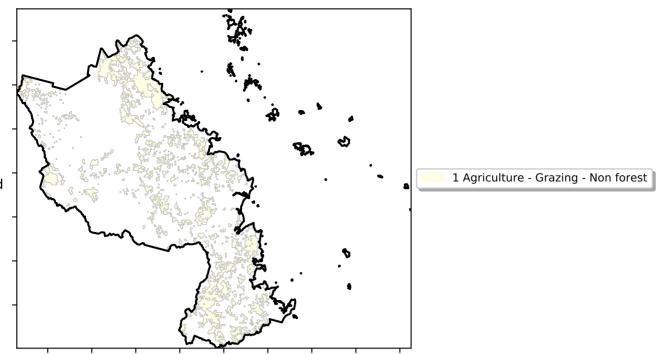


# **Grazing non forest**

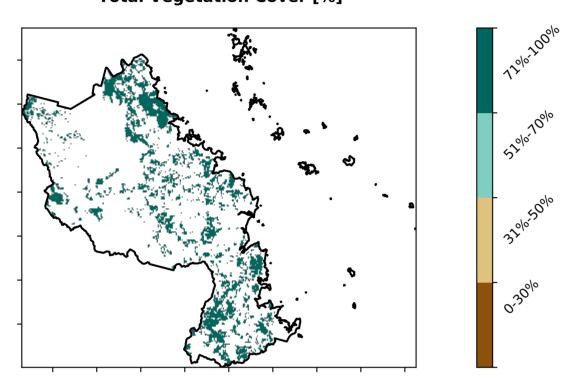
# Land use and forest cover

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

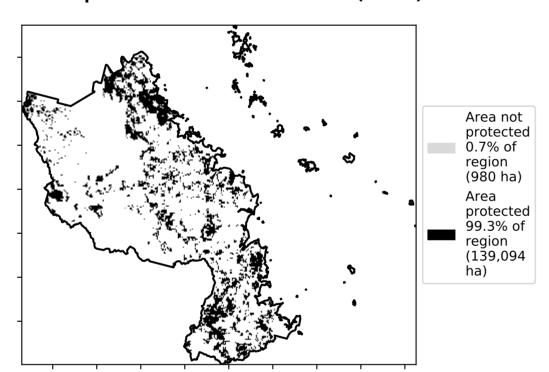
lower than the mean of that



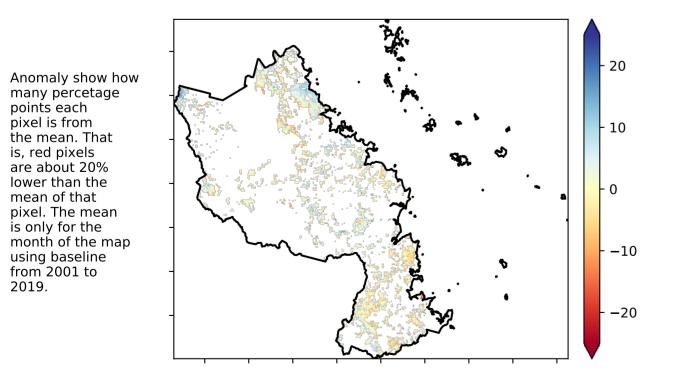
# **Total Vegetation Cover [%]**



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

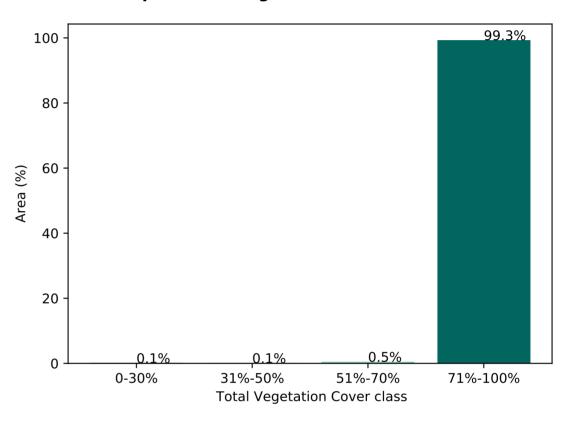


# **Total Vegetation Cover Anomaly [%]**

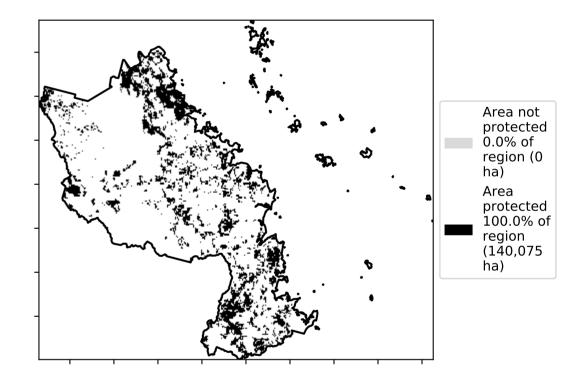


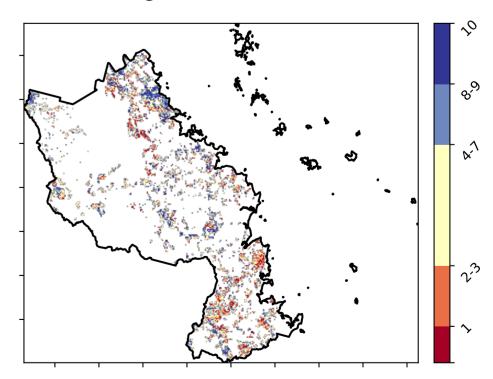
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





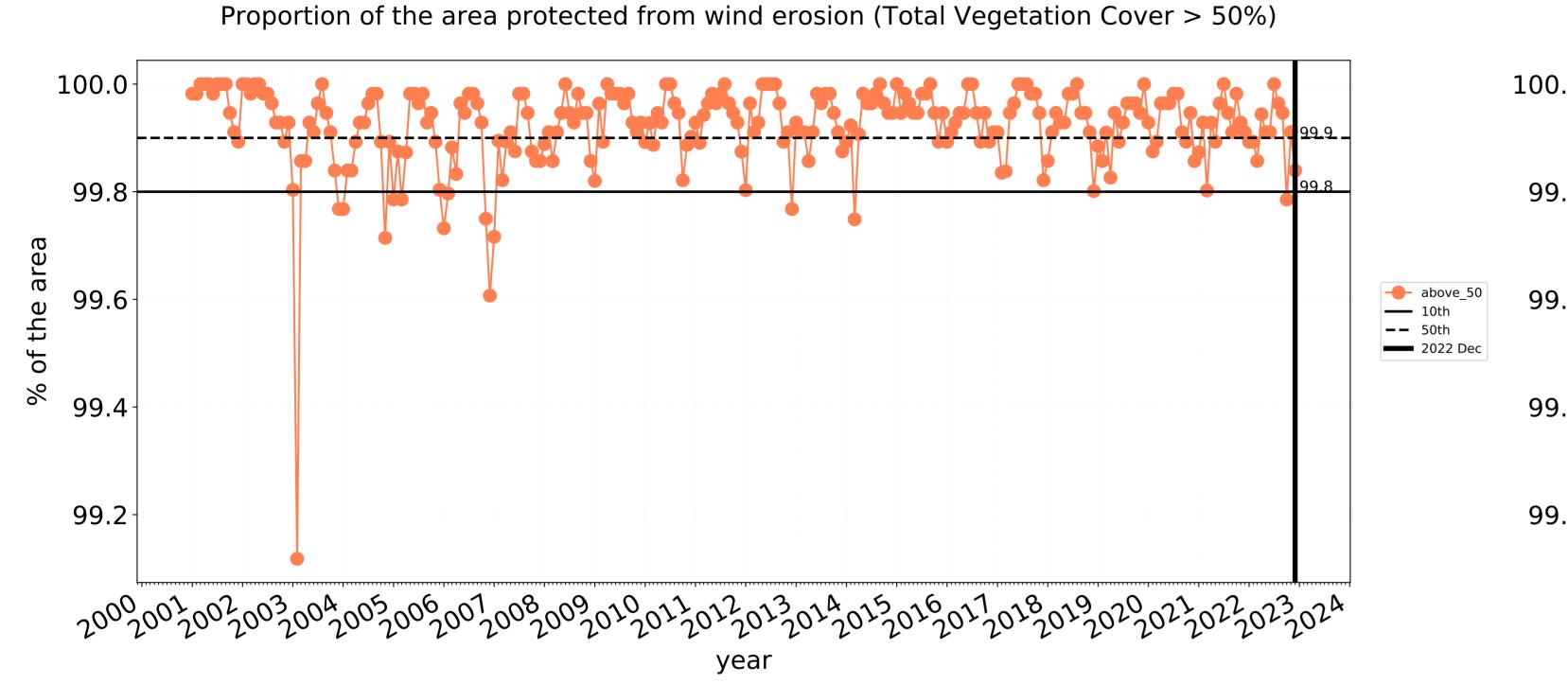


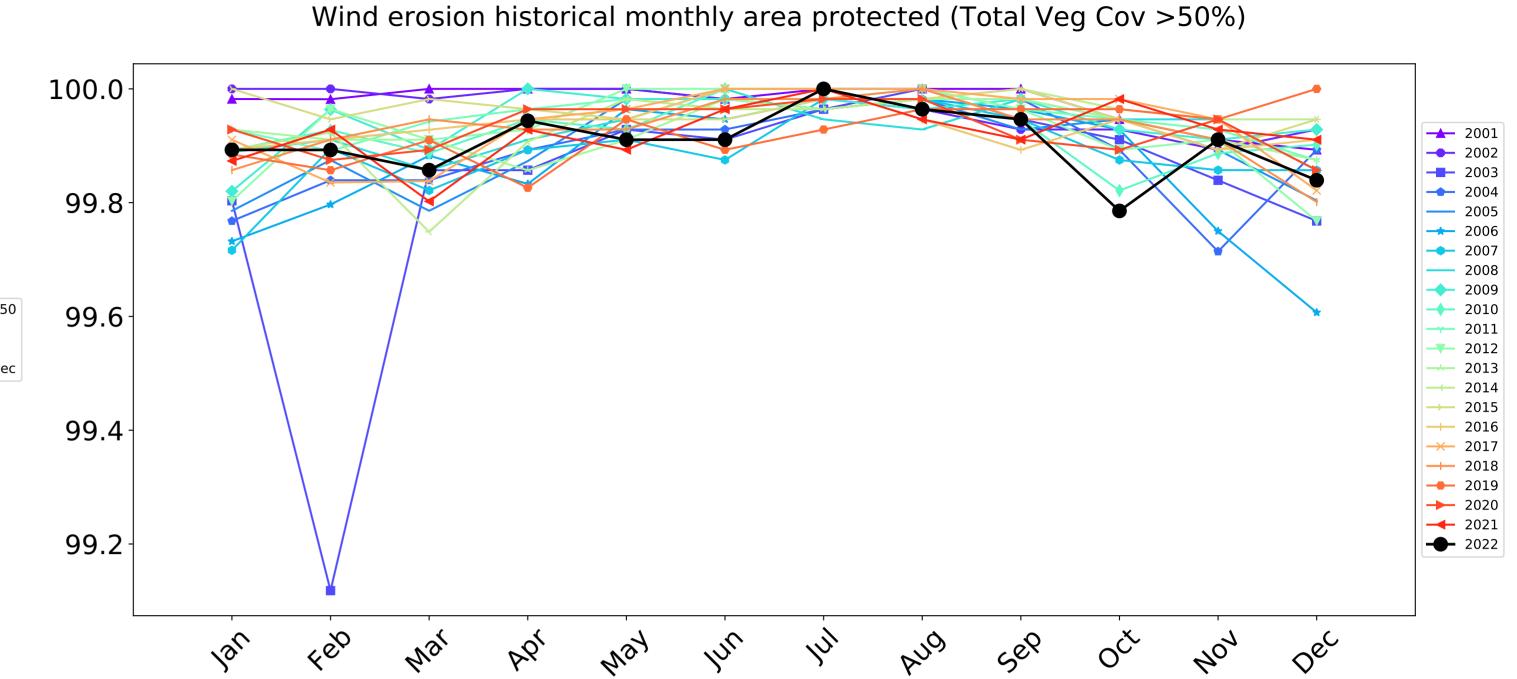




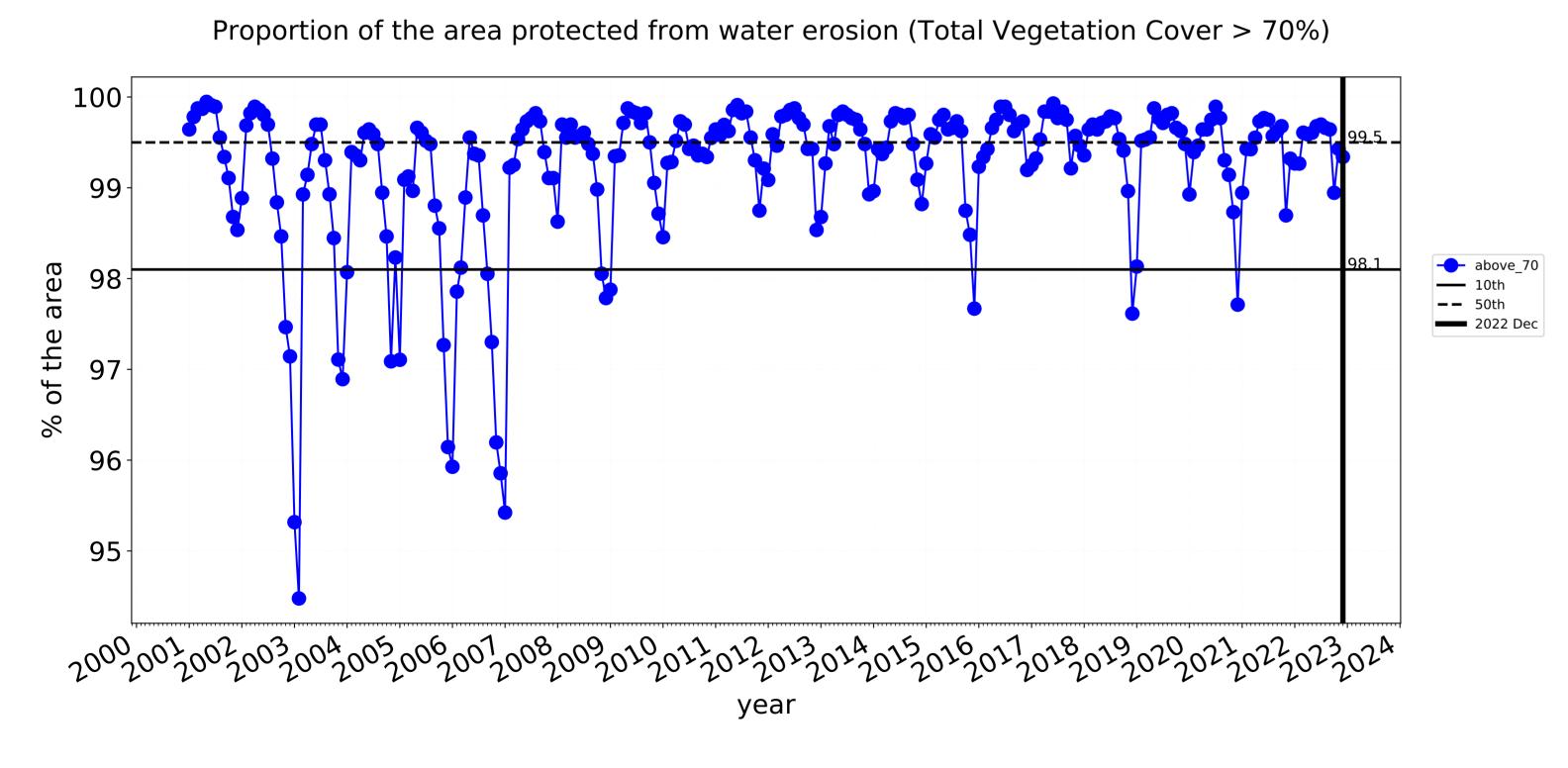


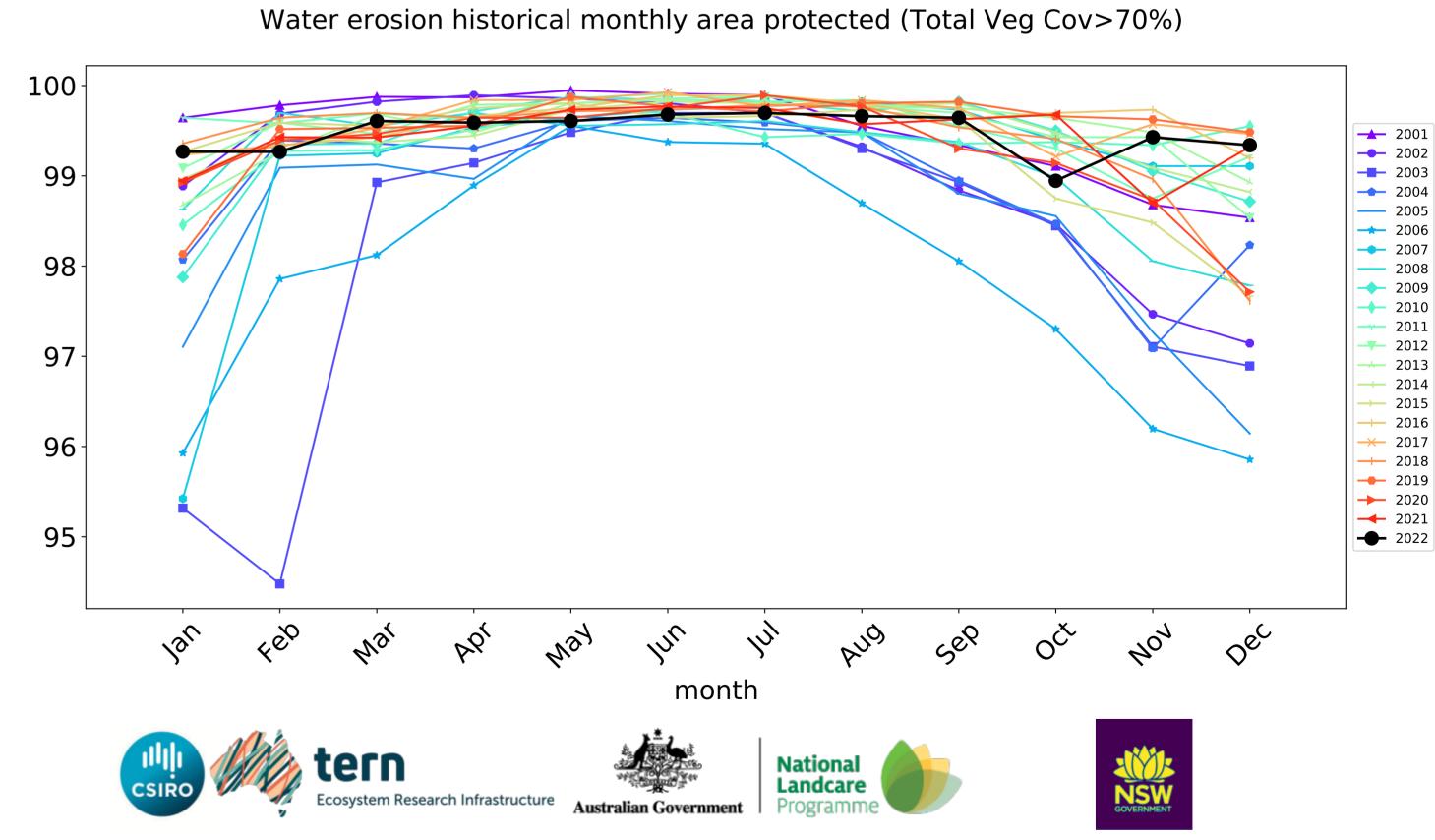
# **Grazing non forest timeseries**

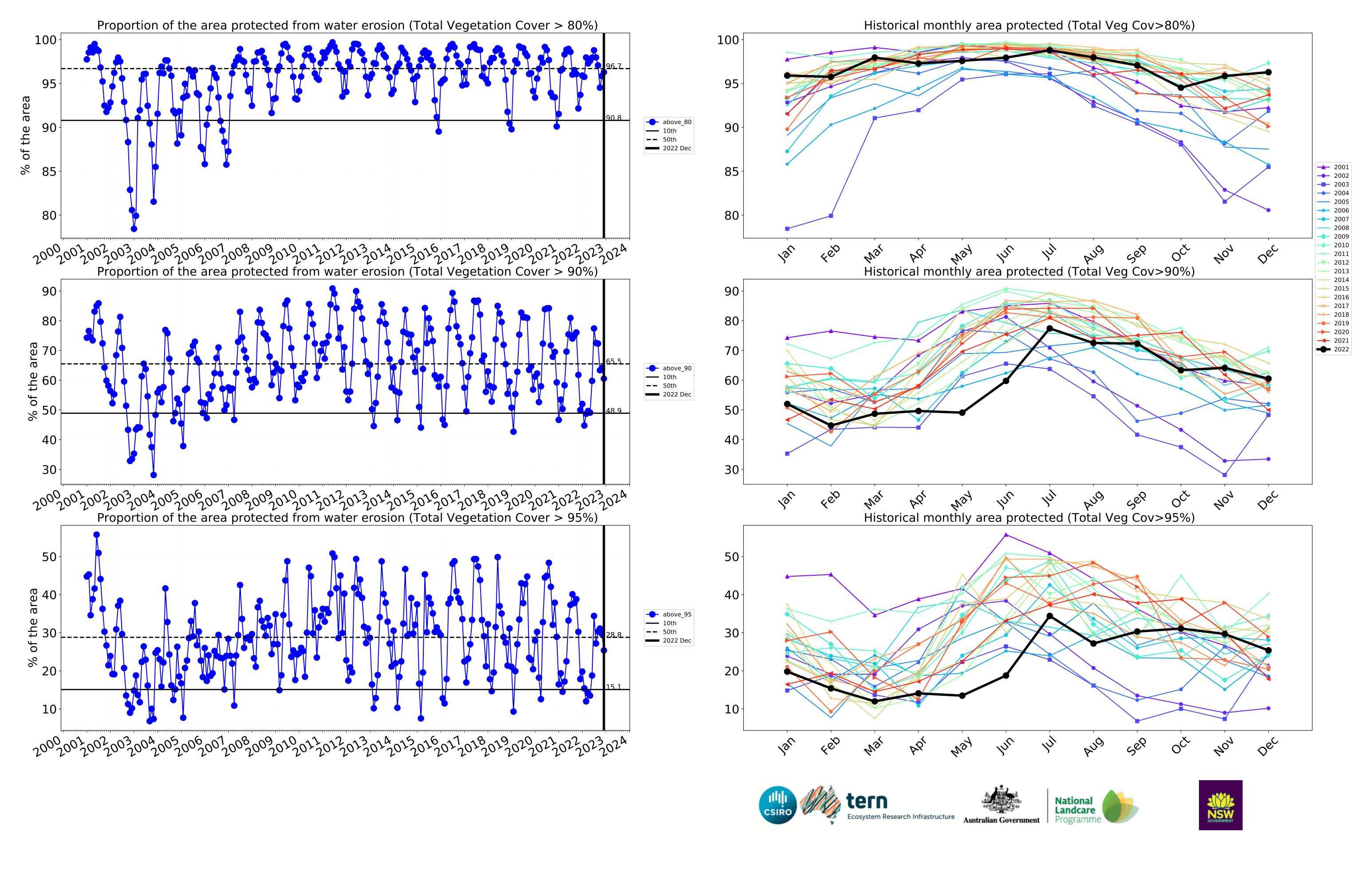




month







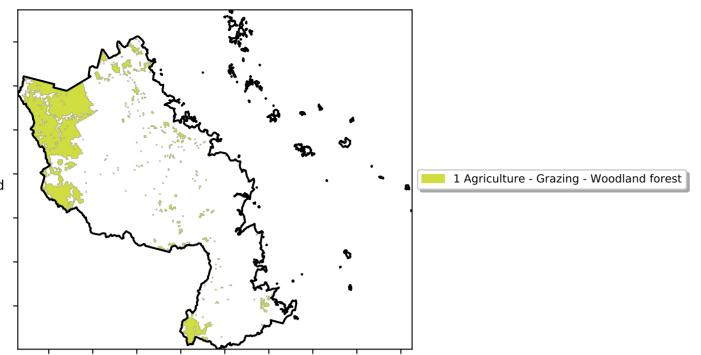
# **Grazing Woodland forest**

# Land use and forest cover

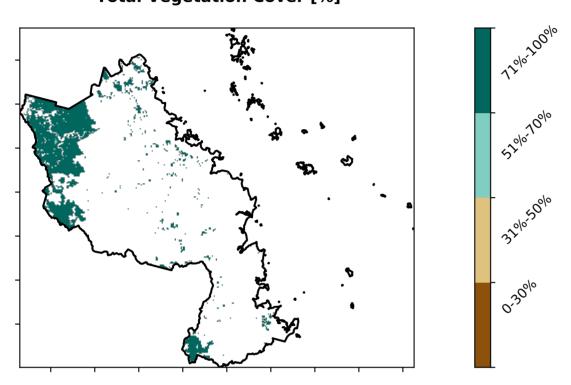
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

lower than the mean of that pixel. The mean

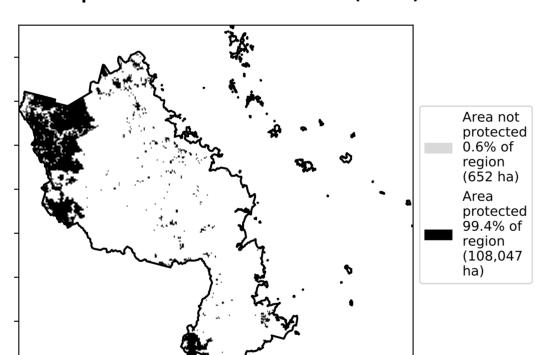
using baseline from 2001 to 2019.



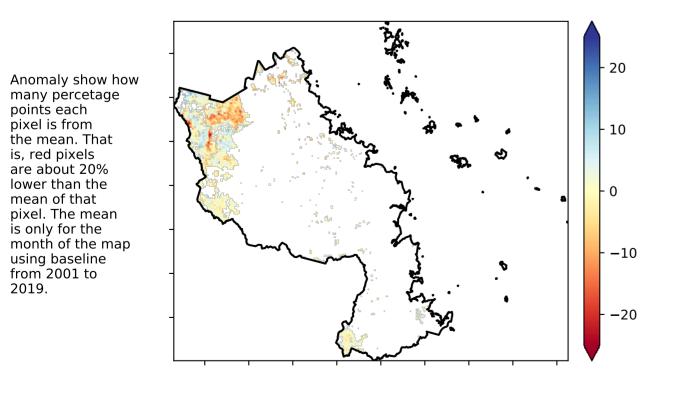
# **Total Vegetation Cover [%]**



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

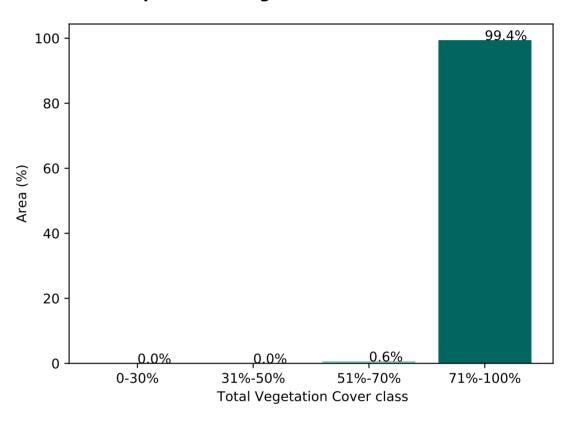


# **Total Vegetation Cover Anomaly [%]**

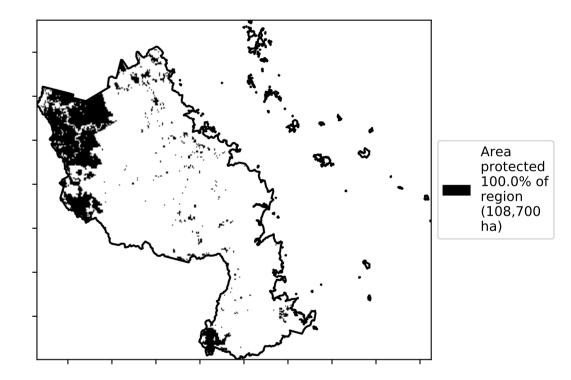


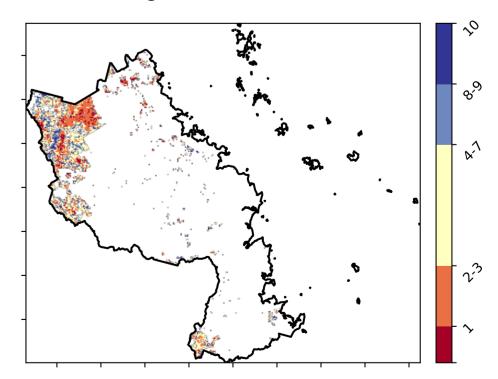
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





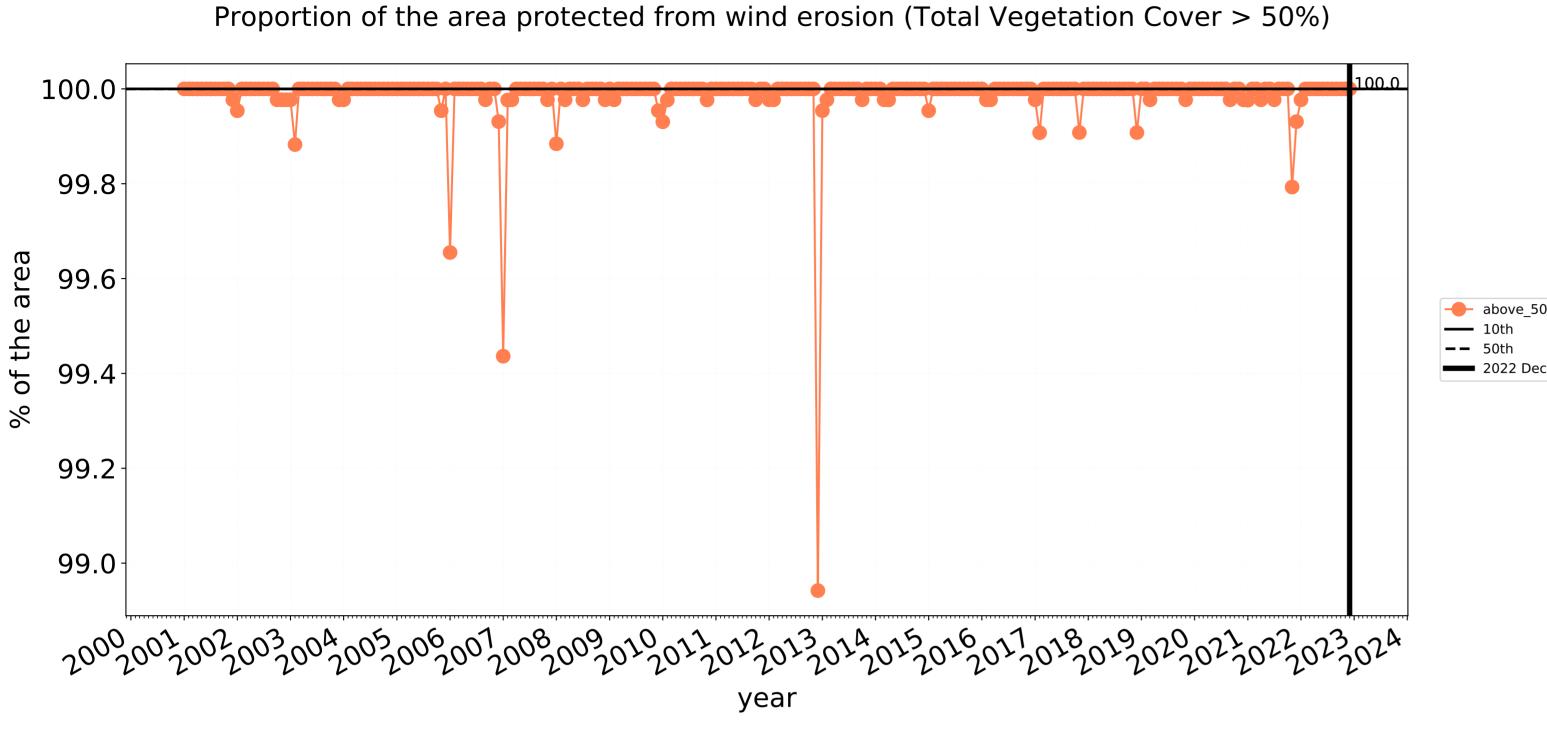


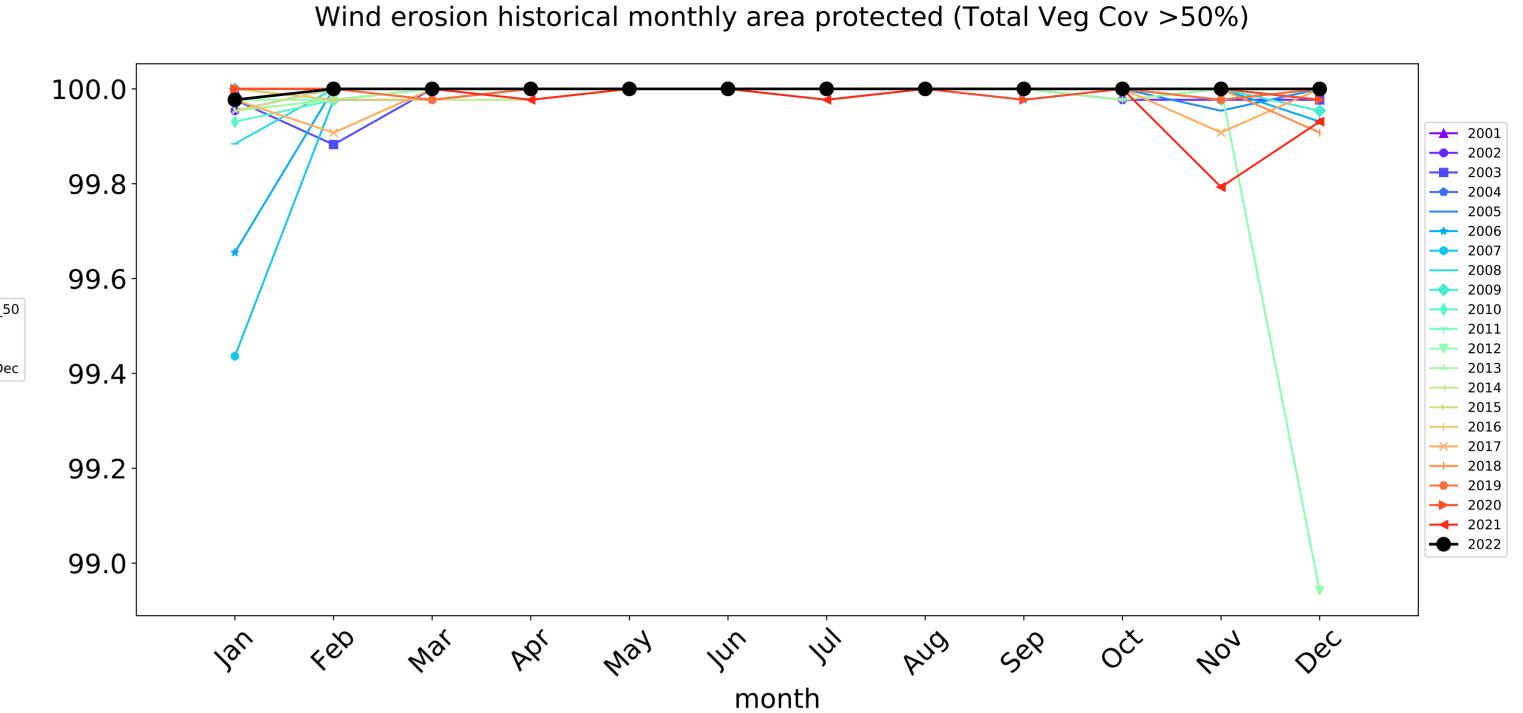


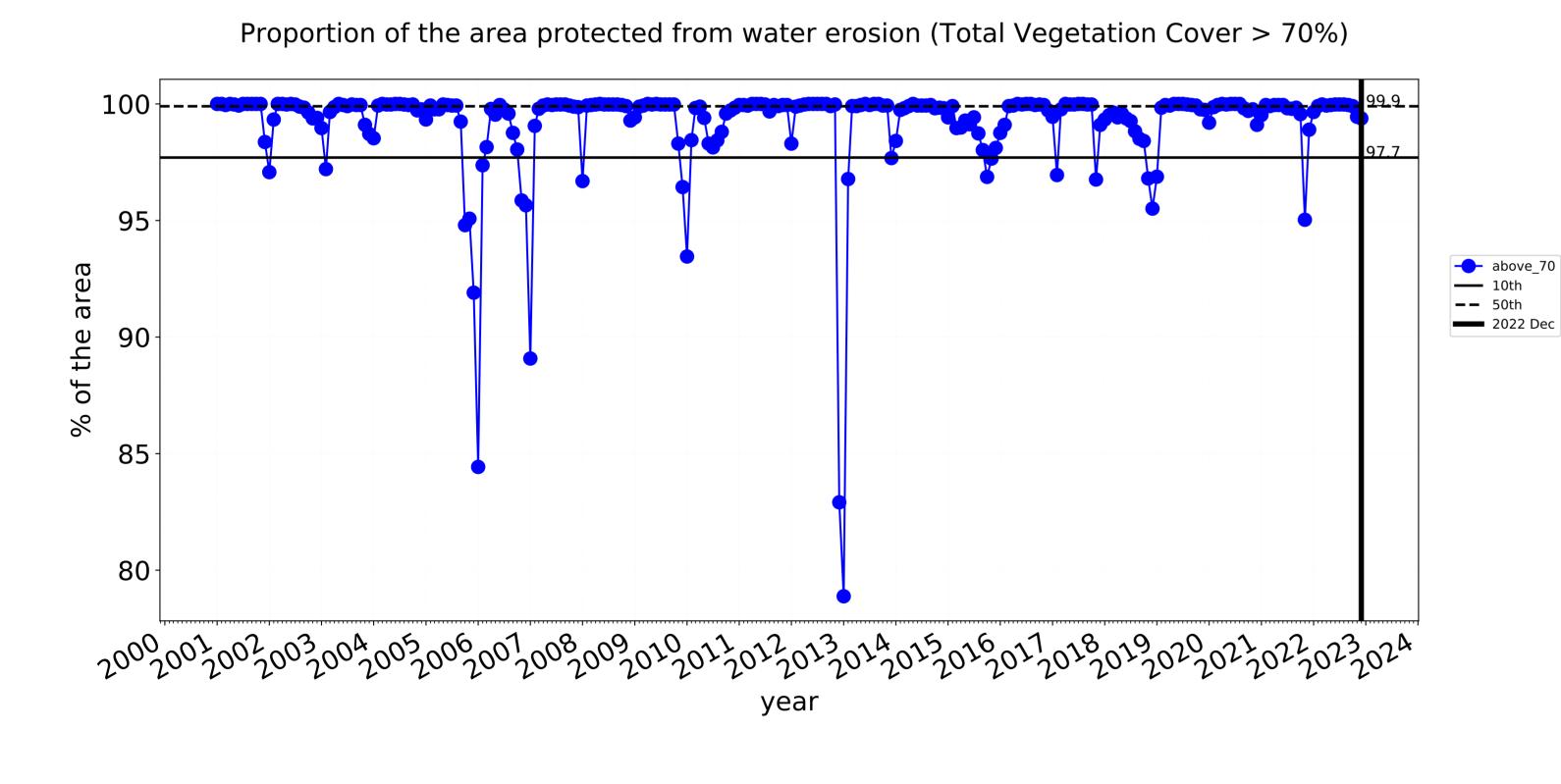


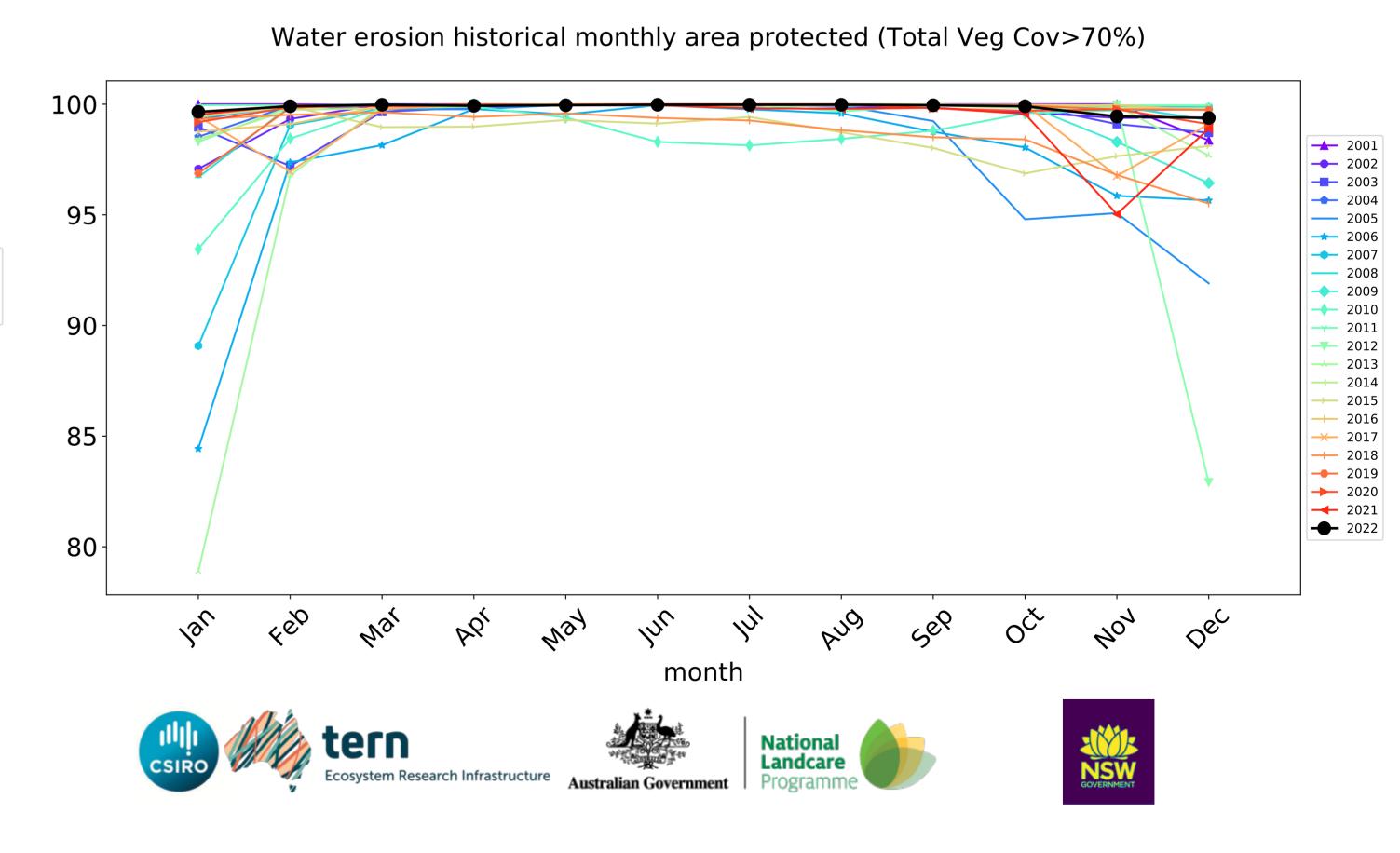


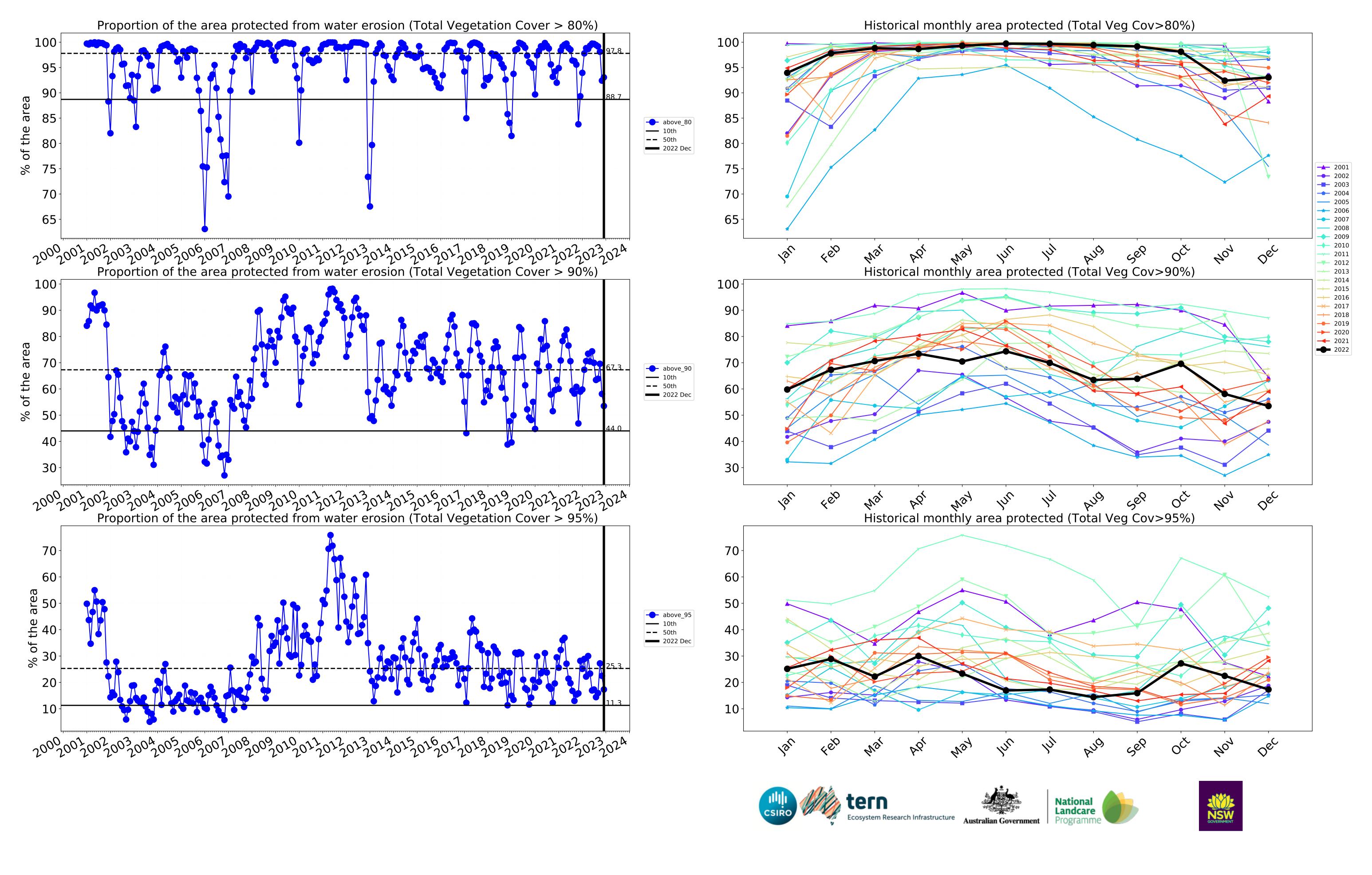
# **Grazing Woodland forest timeseries**











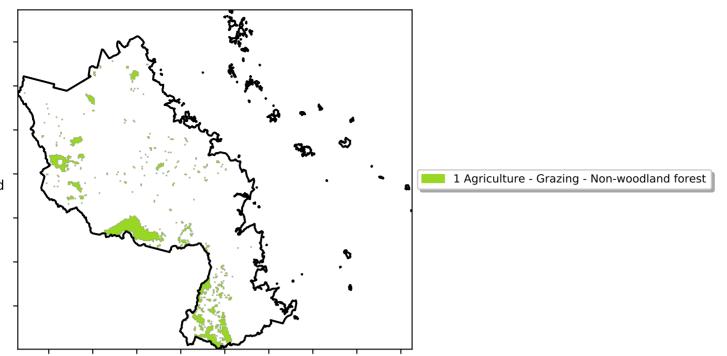
# **Grazing - Forest (non woodland)**

# Land use and forest cover

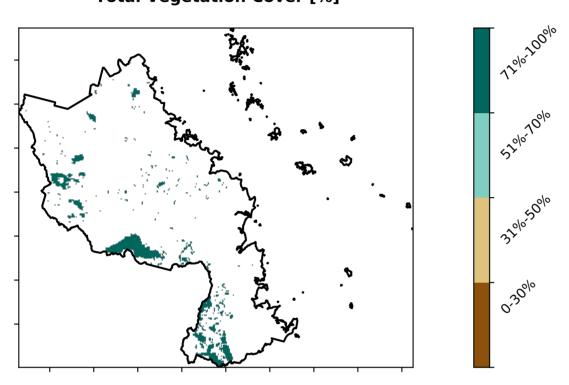
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

lower than the mean of that pixel. The mean is only for the month of the map

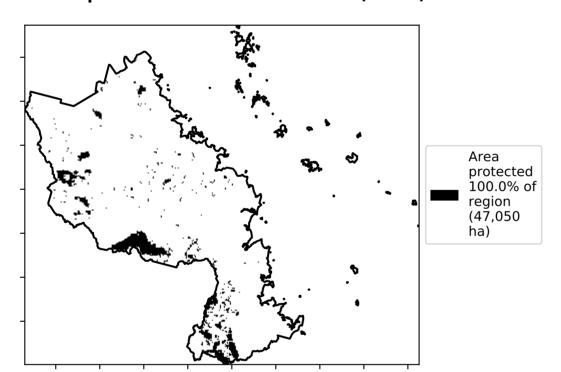
using baseline from 2001 to 2019.



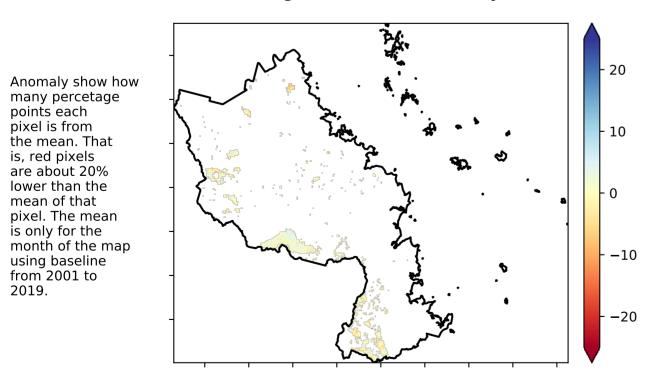
# **Total Vegetation Cover [%]**



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

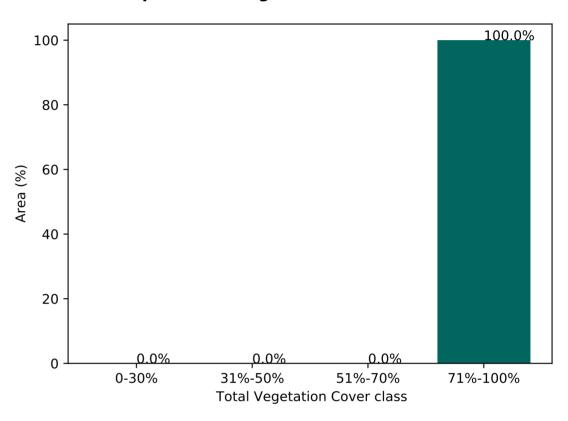


# **Total Vegetation Cover Anomaly [%]**

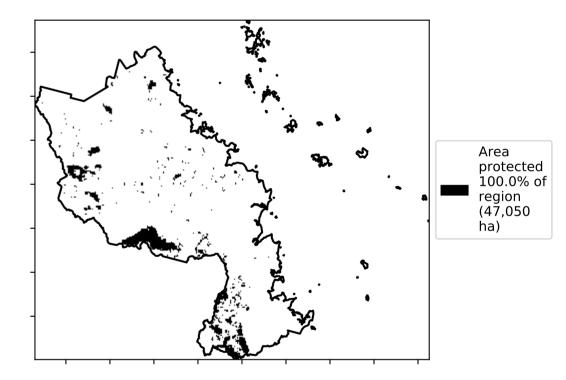


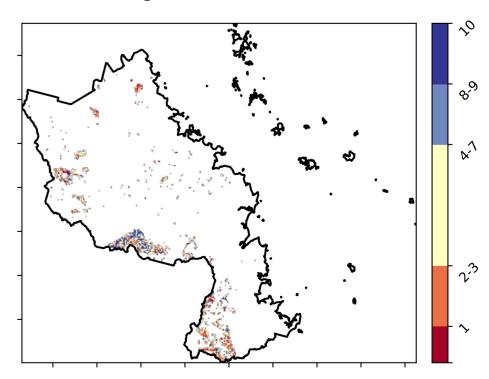
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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



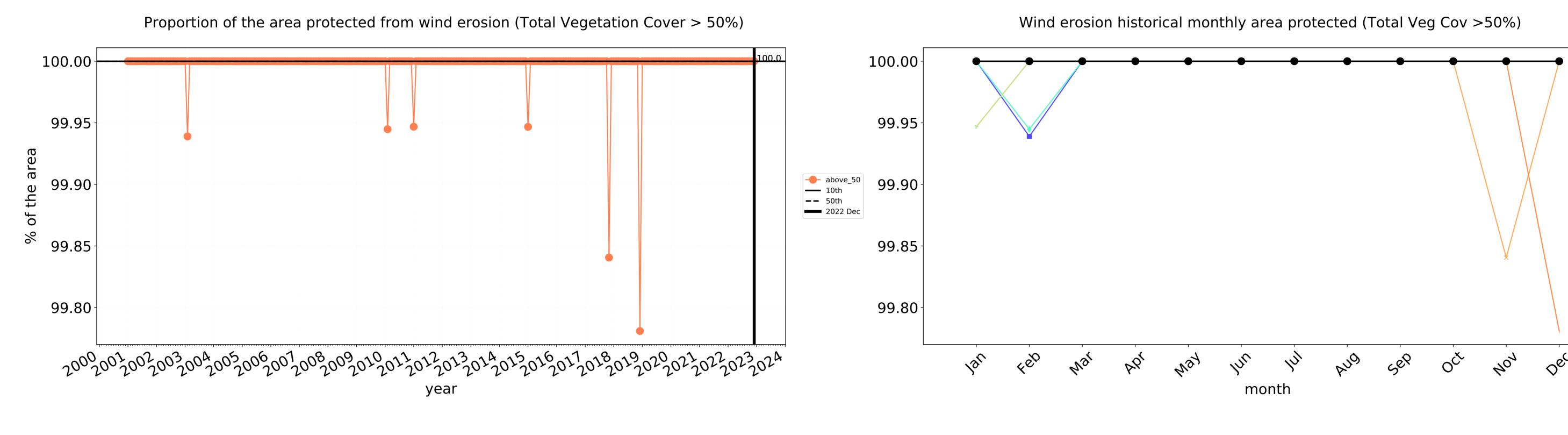


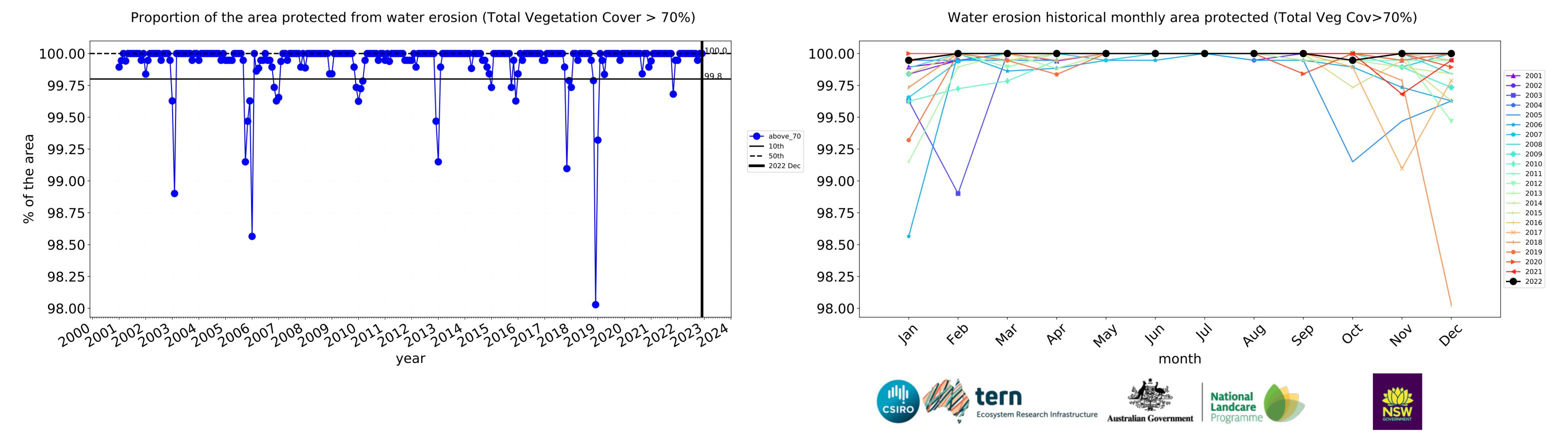




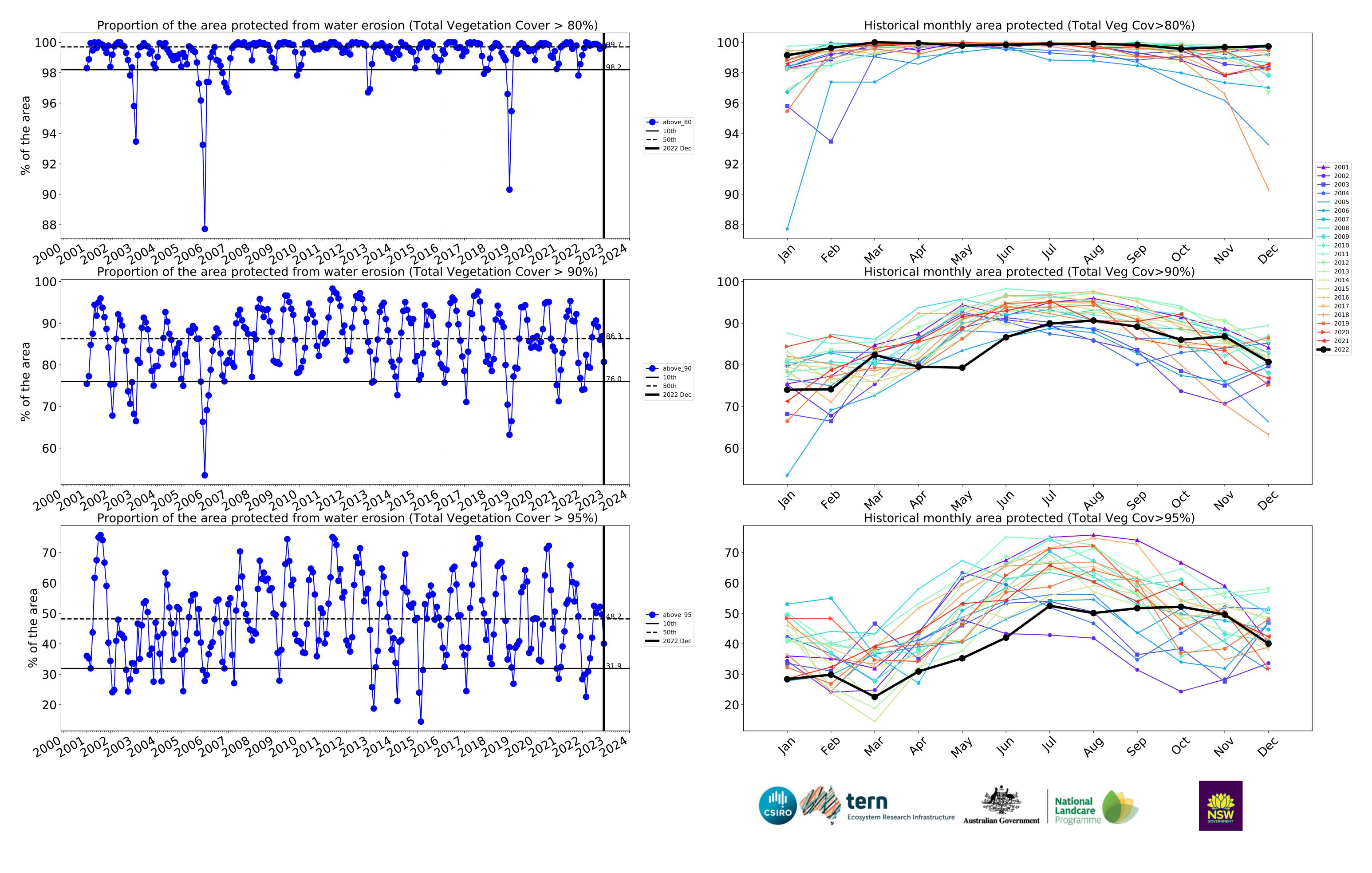








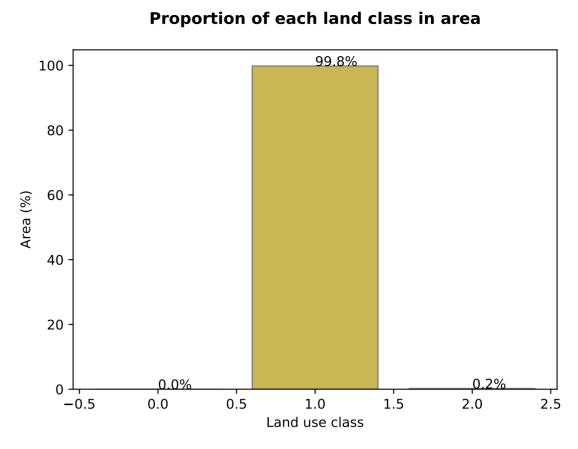
<del>----</del> 2013

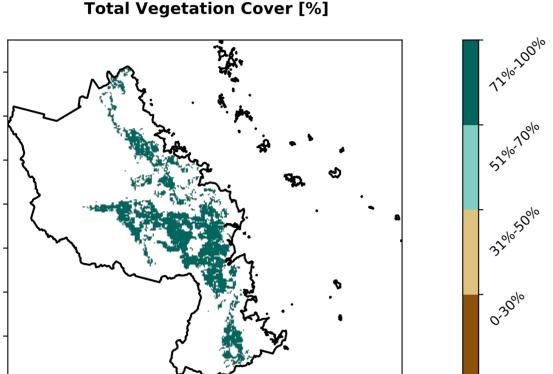


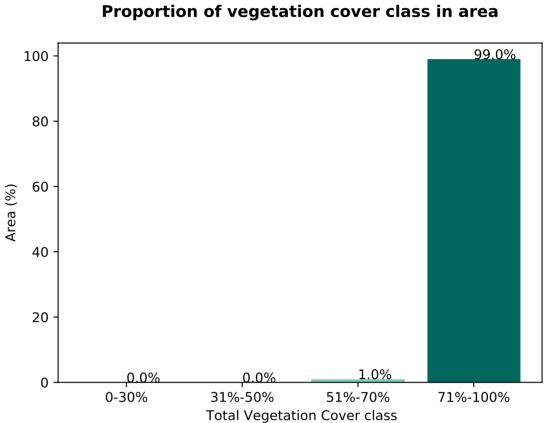
# **Irrigation**

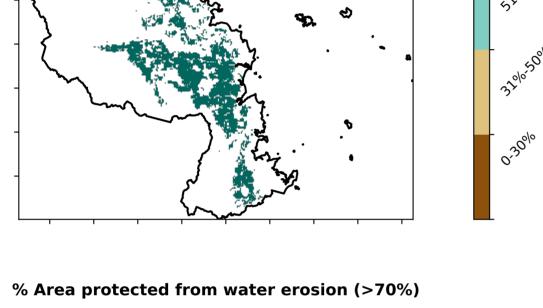
# Land use and forest cover Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018) 1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated

# **Total Vegetation Cover [%]**

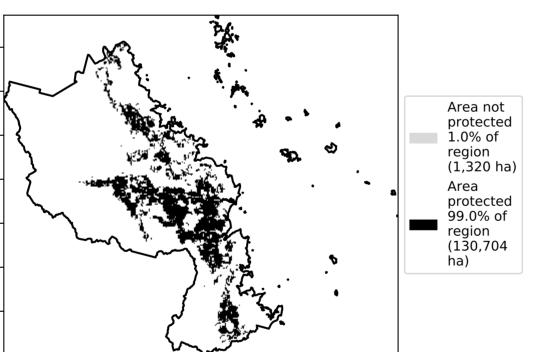


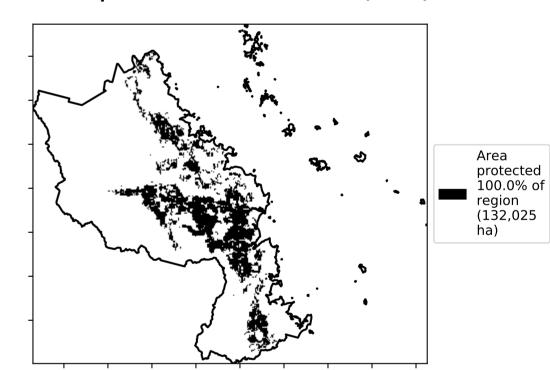






% Area protected from wind erosion (>50%)







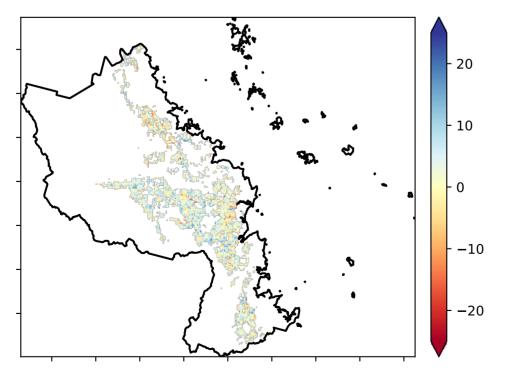
Anomaly show how many percetage points each pixel is from the mean. That is, red pixels

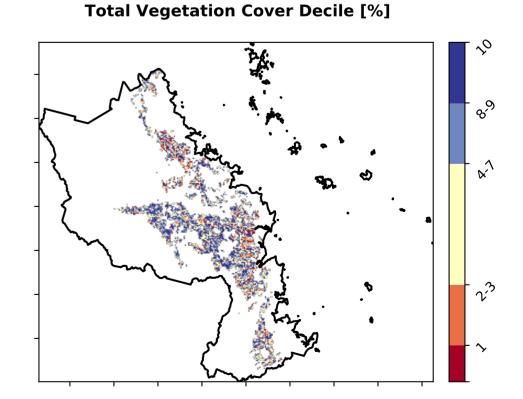
are about 20% lower than the

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

using baseline from 2001 to 2019.

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



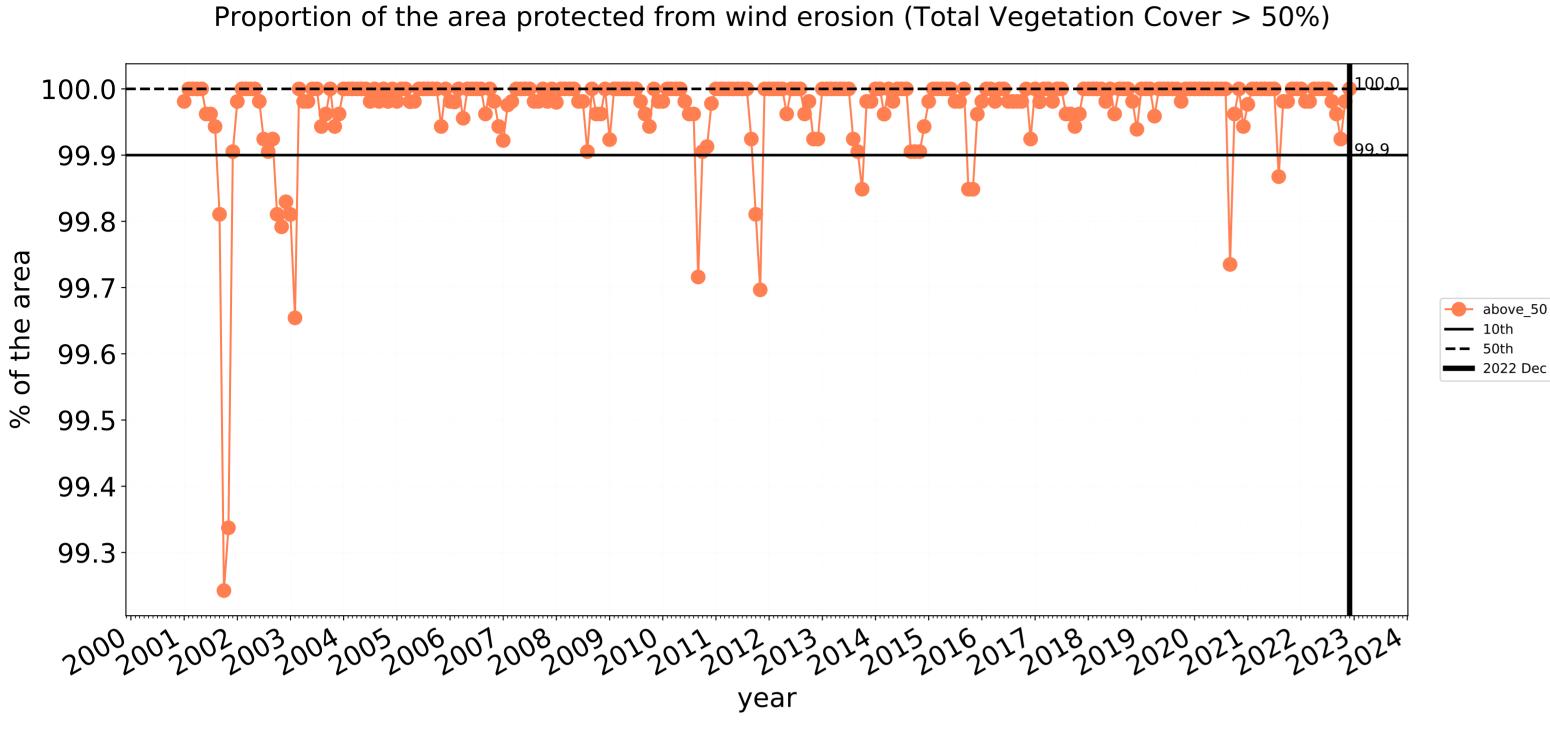


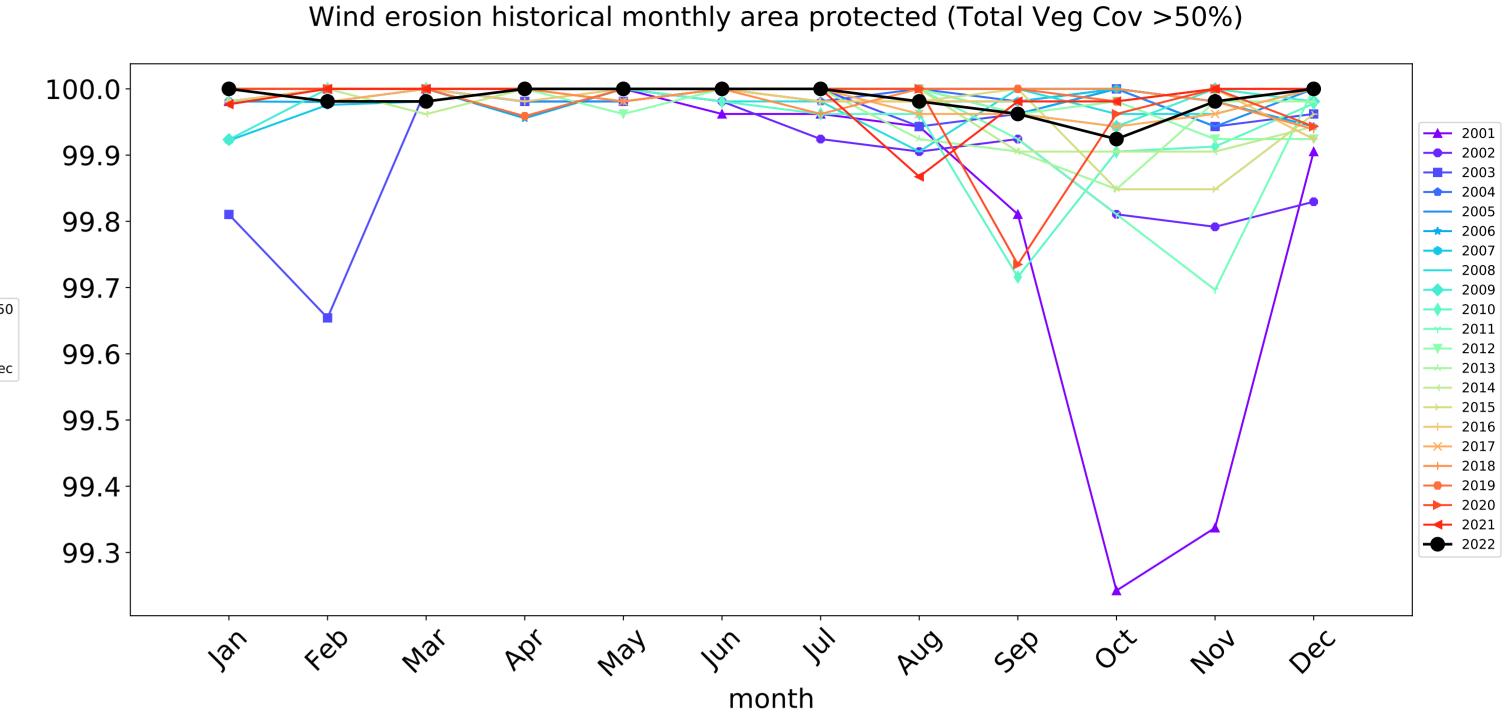


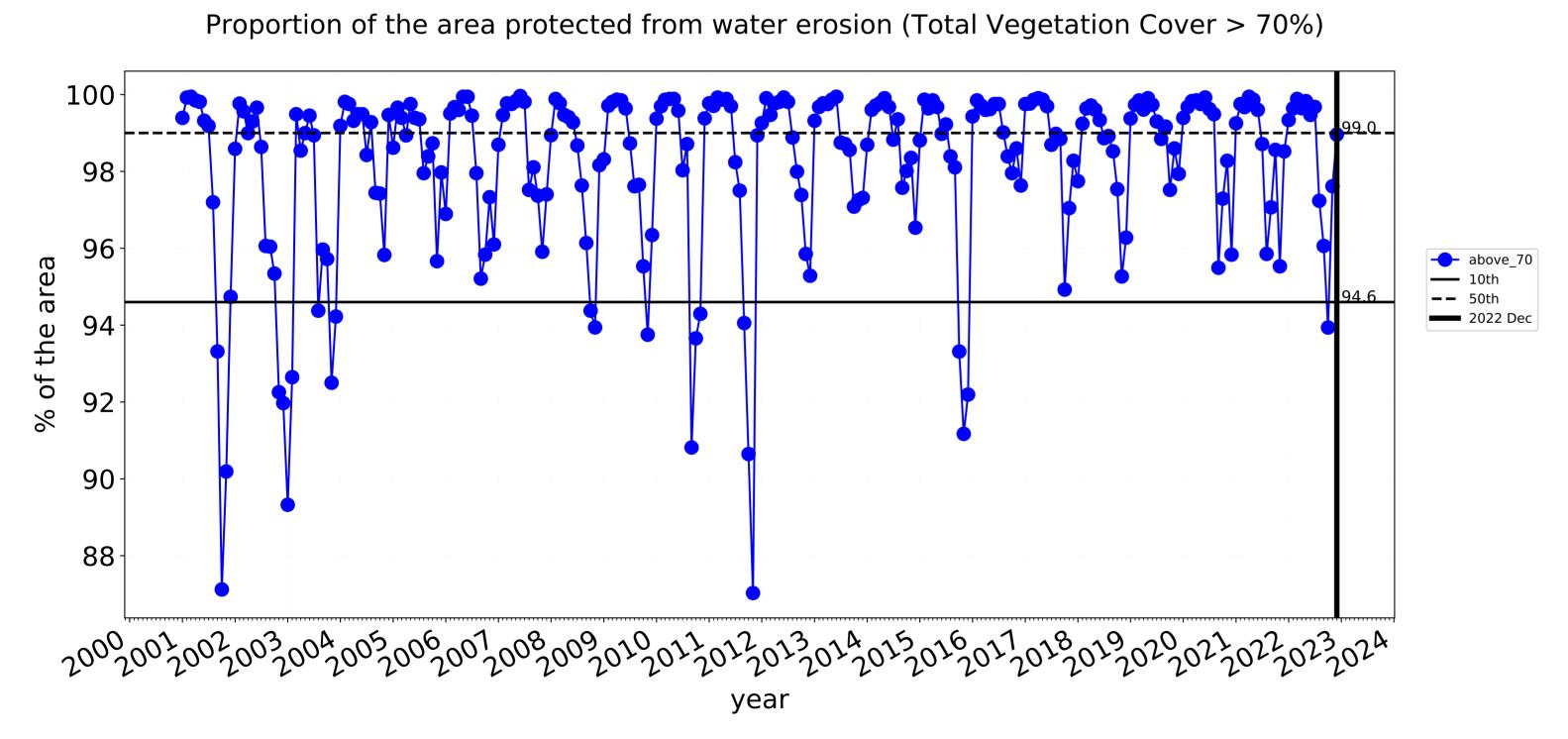


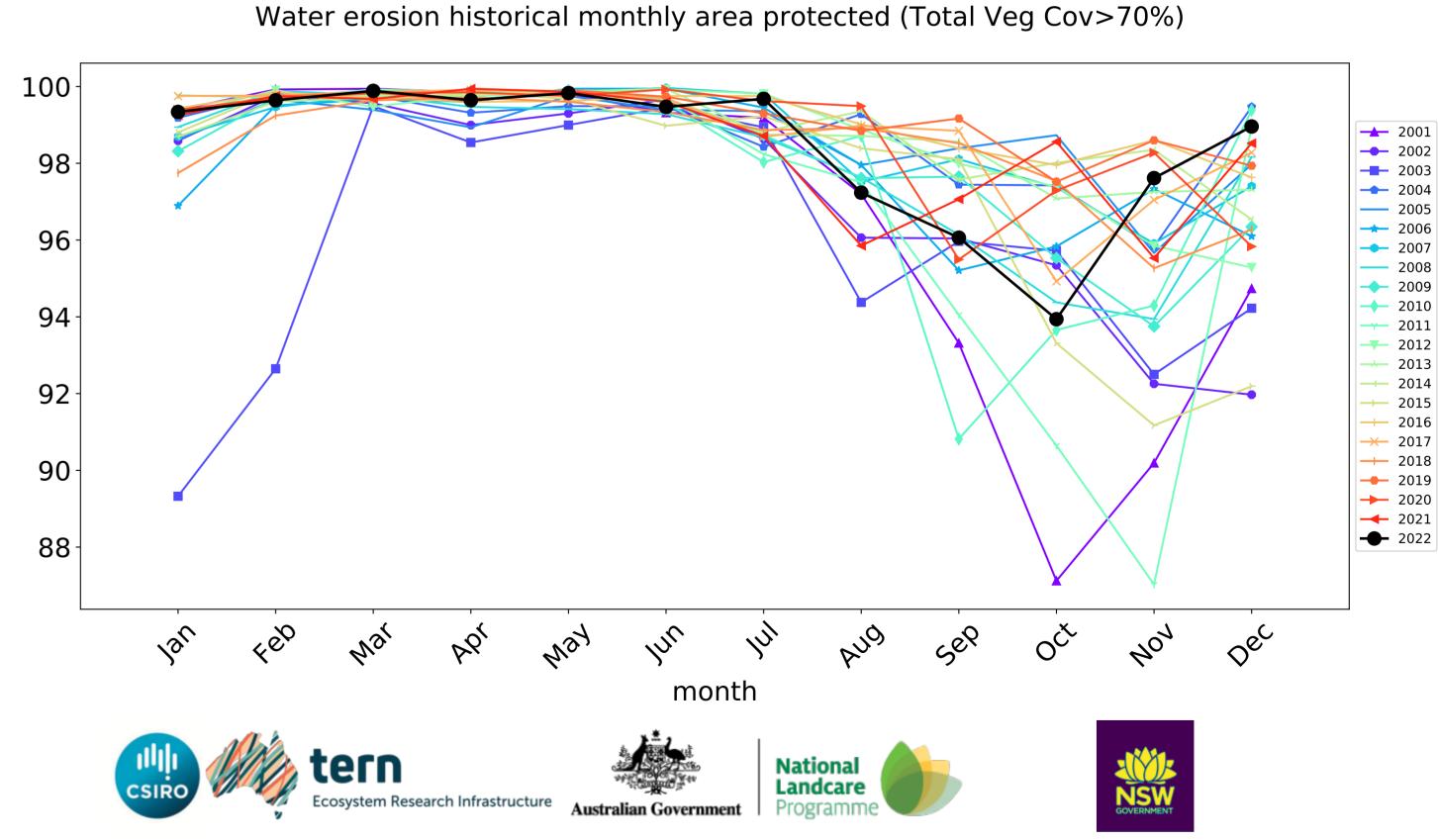


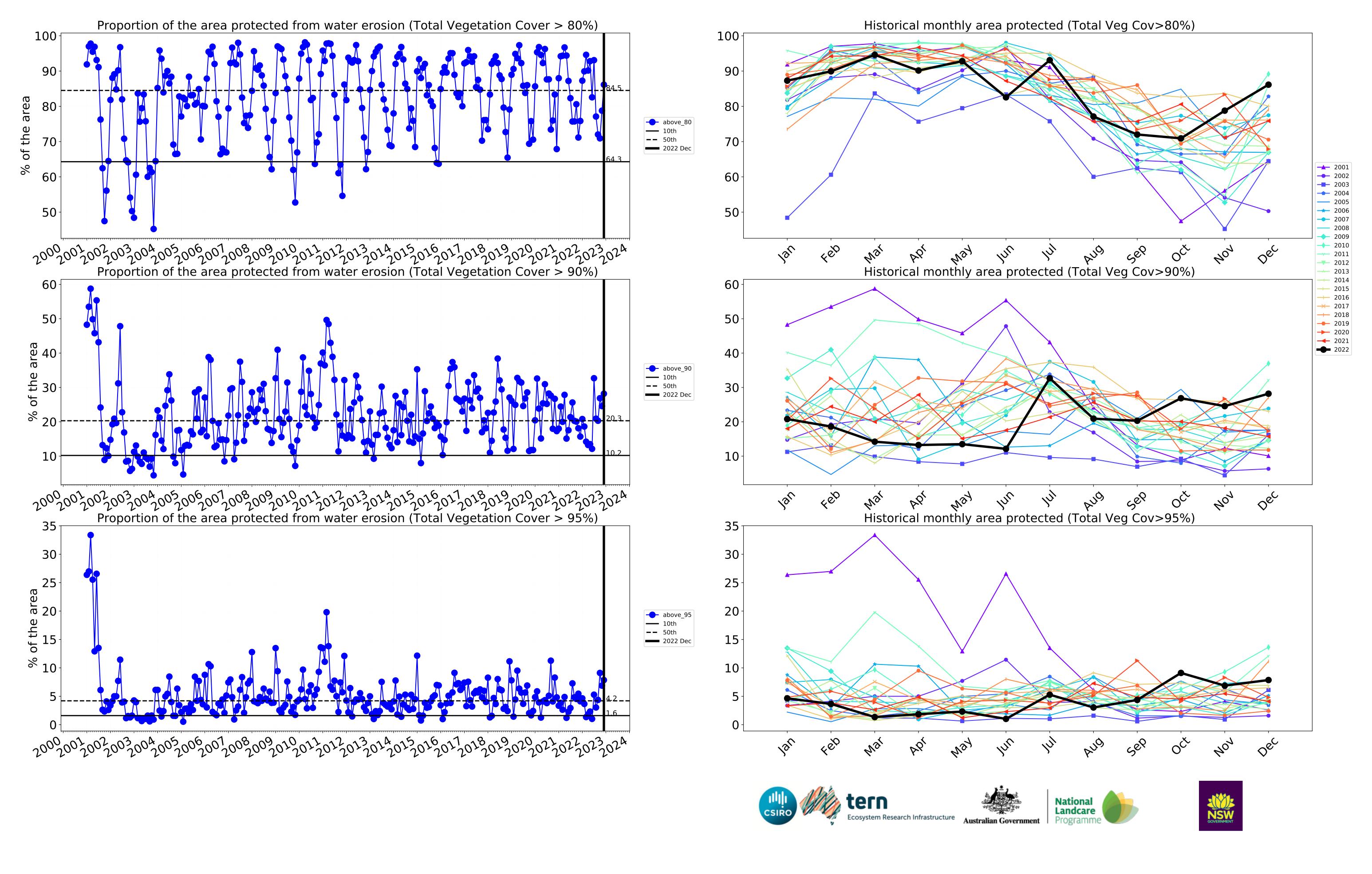
# Irrigation timeseries











# **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)

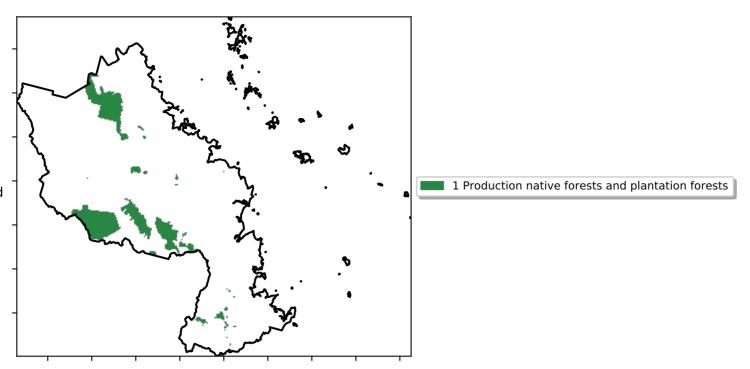
Anomaly show how many percetage points each pixel is from

the mean. That

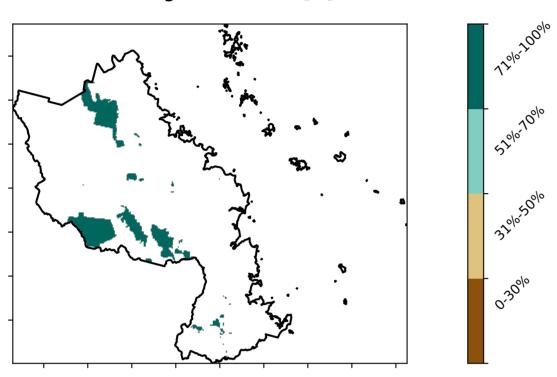
is, red pixels are about 20% lower than the

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

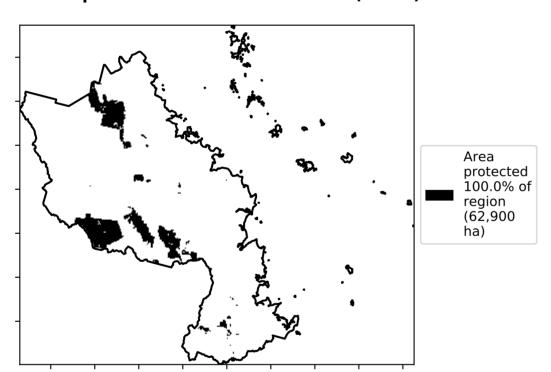
using baseline from 2001 to 2019.



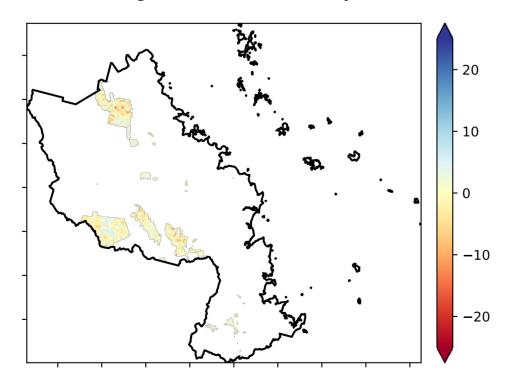
# **Total Vegetation Cover [%]**



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

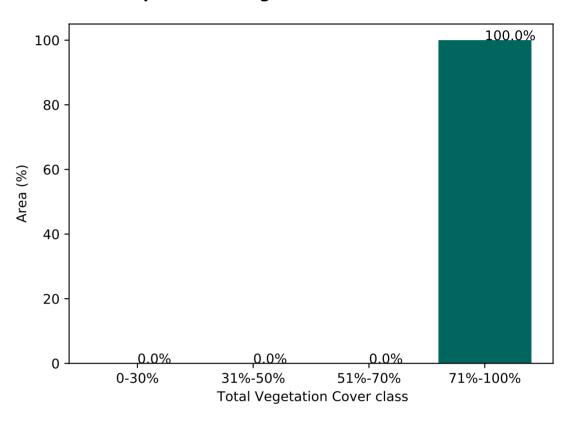


# **Total Vegetation Cover Anomaly [%]**

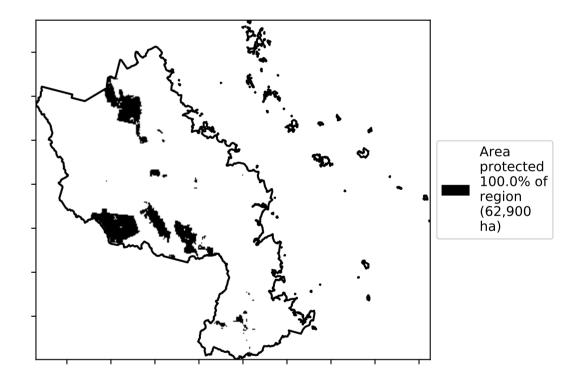


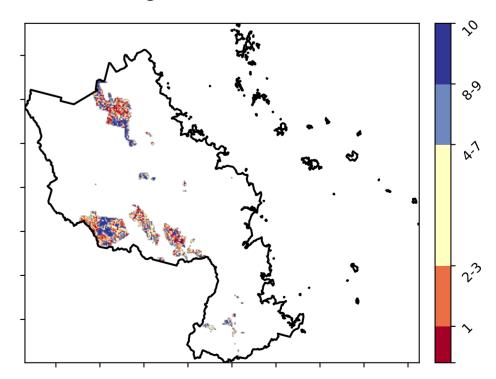
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





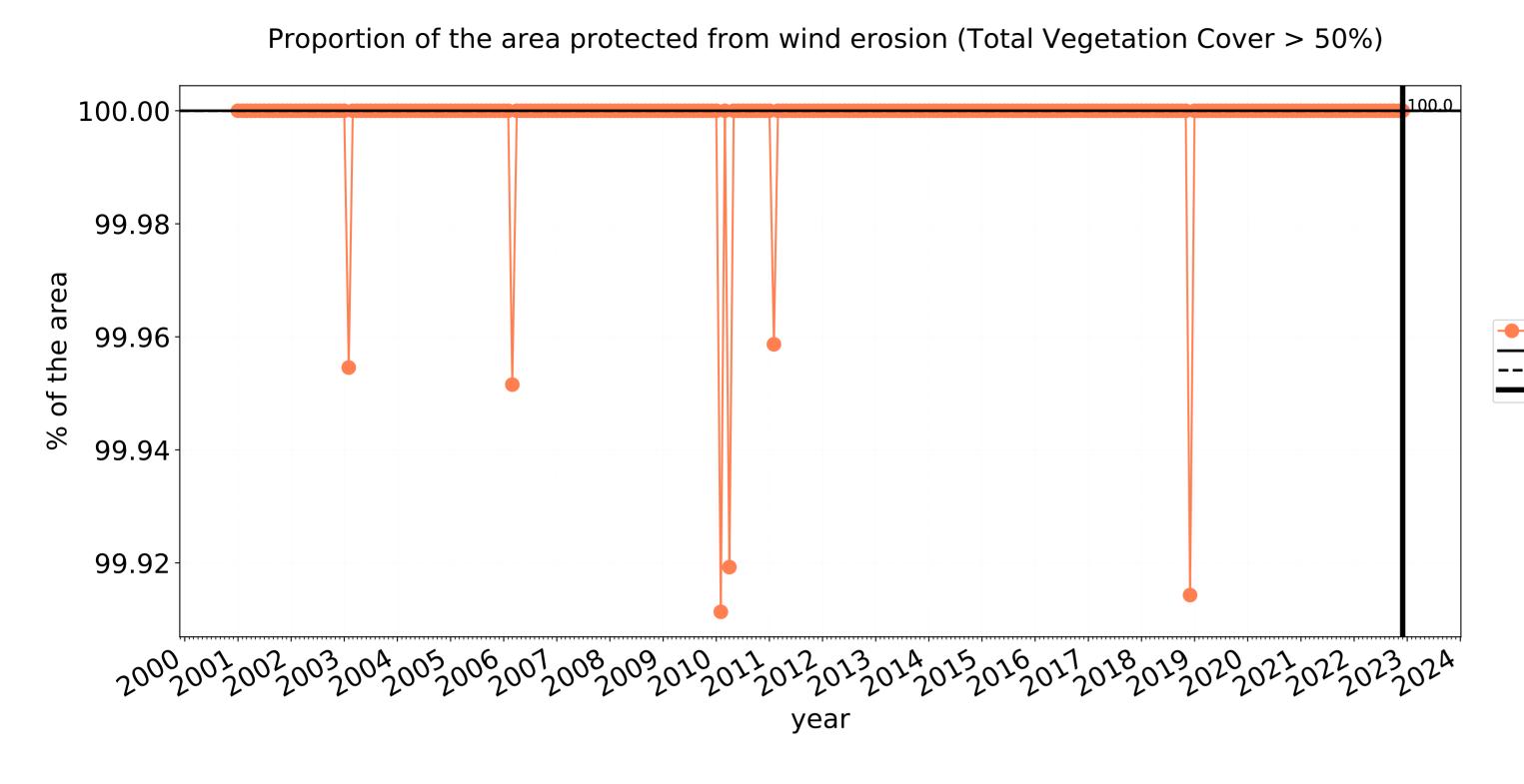


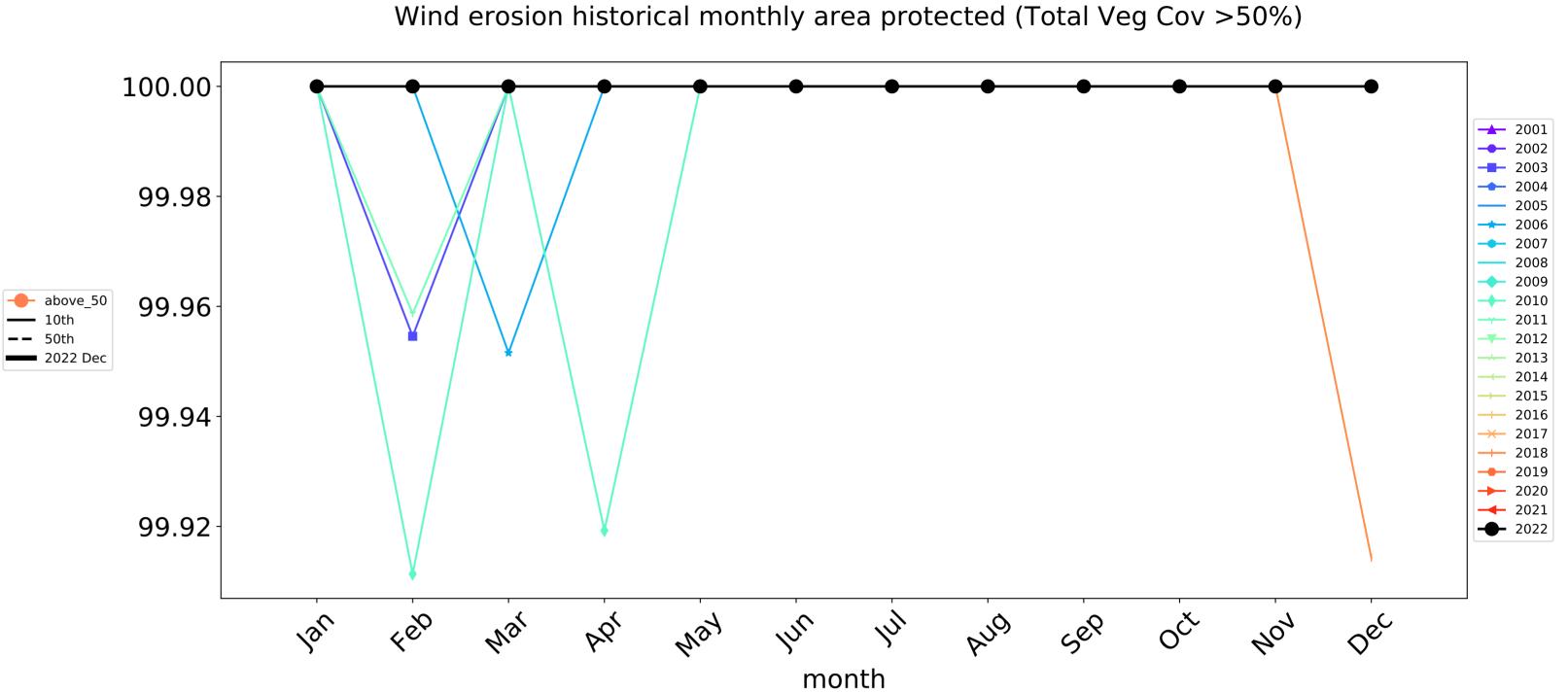


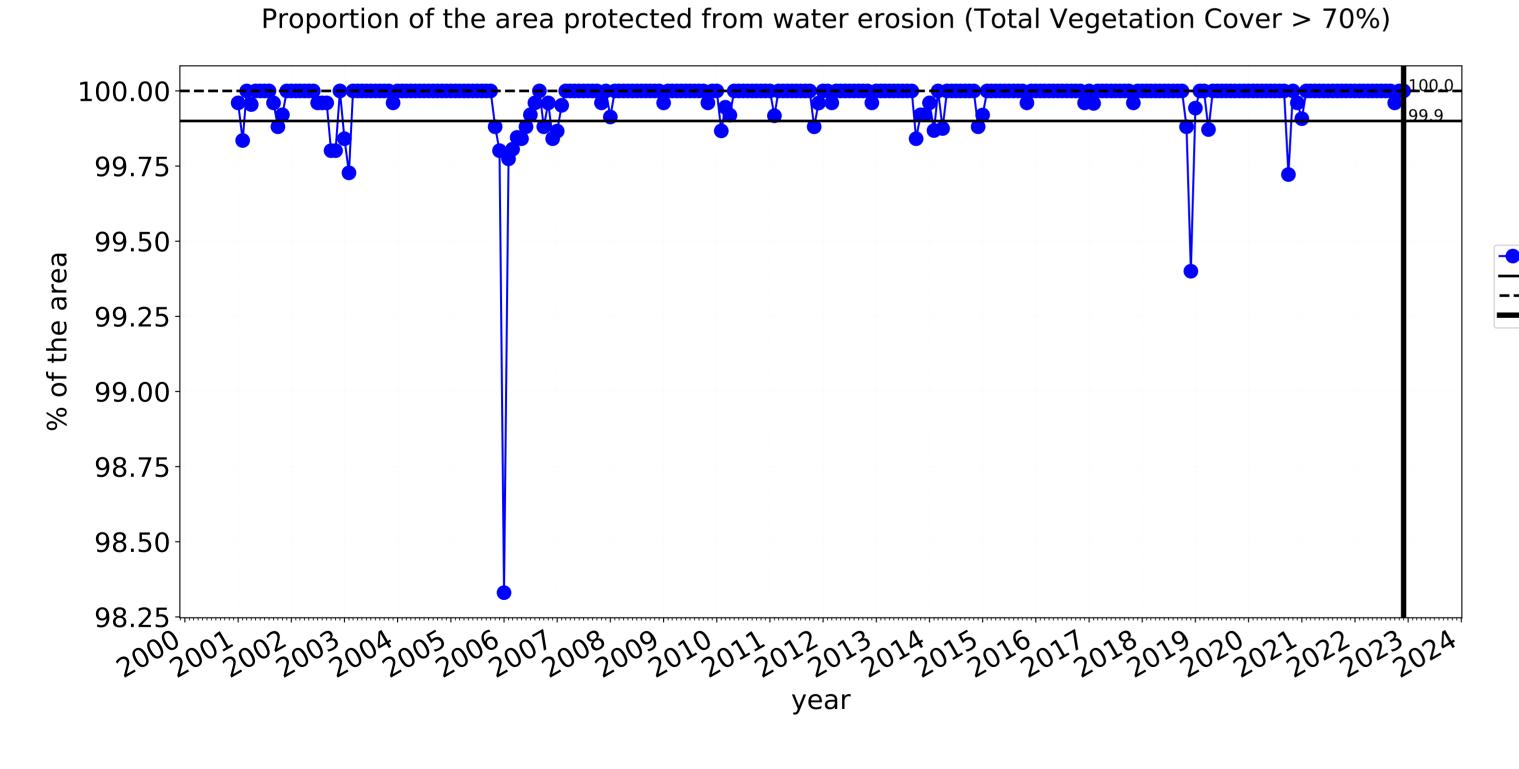


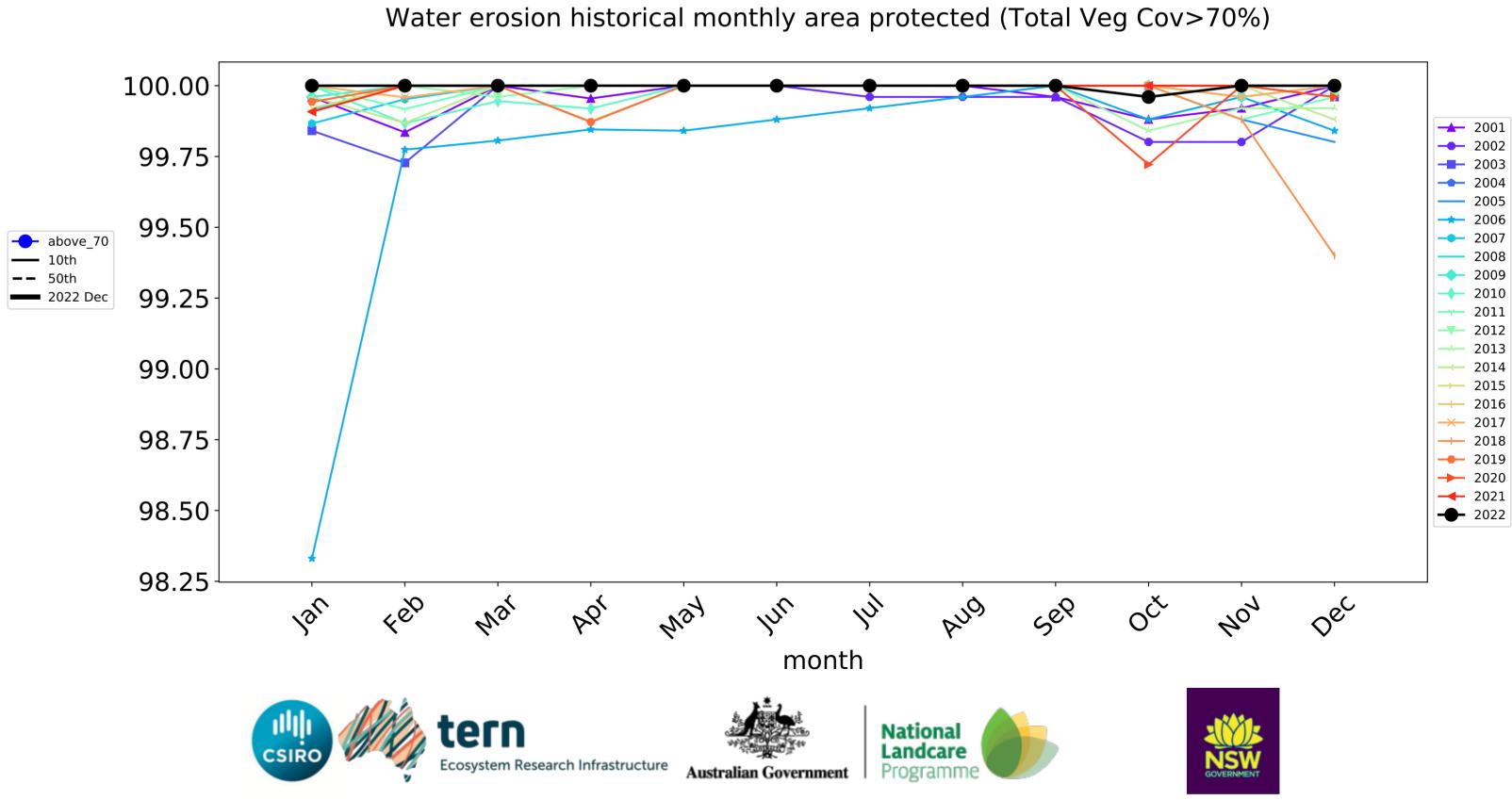


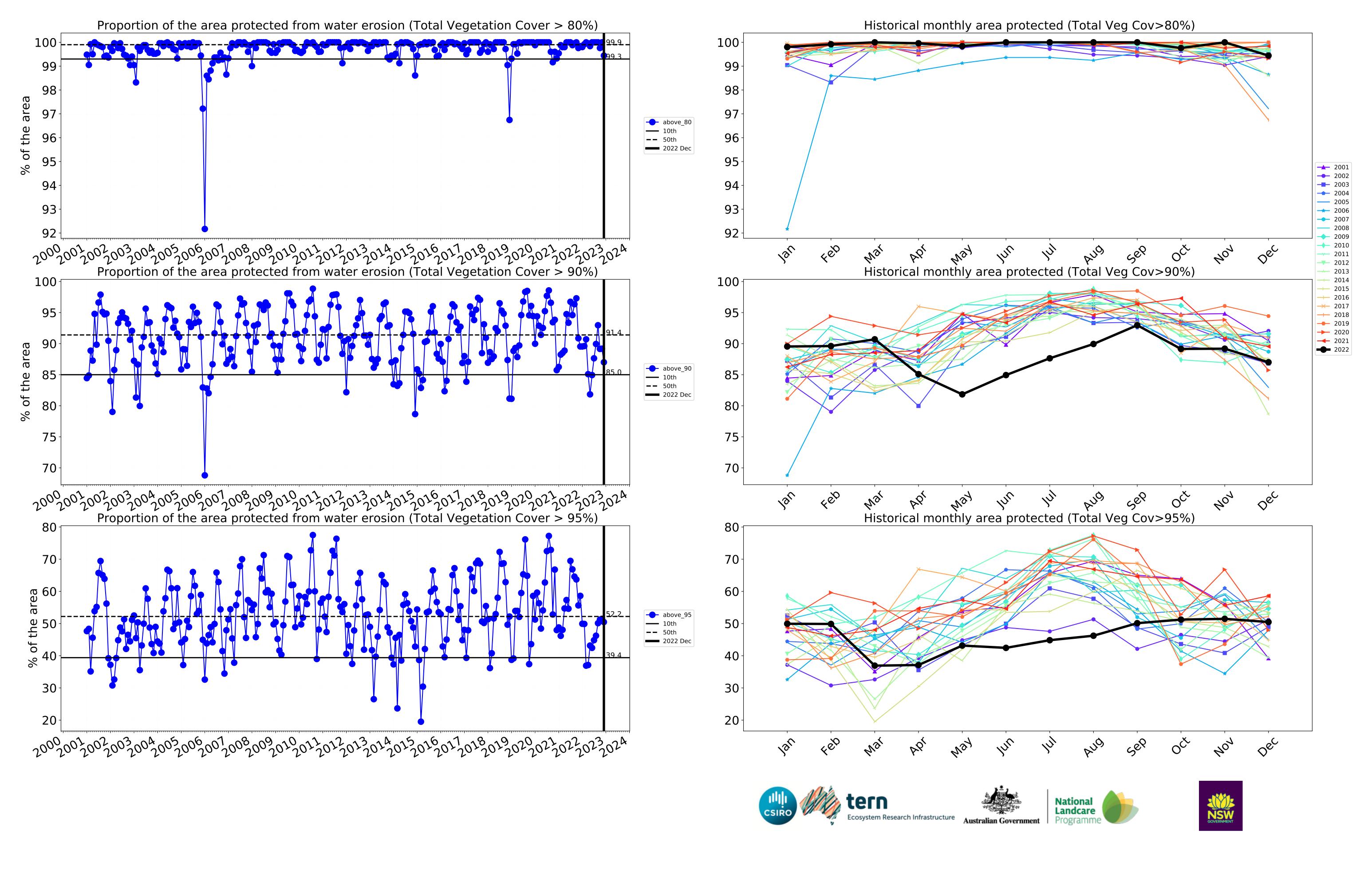
# **Production native forests and plantation forests timeseries**











# Mackay\_(R) (749,250 ha and no data 12,061 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	749,250	99.9% 748,625	99.7% 746,825	98.1% 735,275	92.1% 689,975	59.2% 443,400	28.2% 211,150
Conservation and natural environments	192,300	99.9% 192,050	99.7% 191,650	98.6% 189,550	97.0% 186,450	78.5% 150,950	45.7% 87,800
Conservation and natural environments non forest	5,025	98.0% 4,925	96.0% 4,825	88.1% 4,425	75.6% 3,800	42.3% 2,125	20.4% 1,025
Conservation and natural environments Woodland forest	37,025	99.8% 36,950	99.5% 36,850	97.6% 36,125	95.4% 35,325	67.0% 24,825	30.5% 11,300
Conservation and natural environments Forest (non woodland)	150,250	100.0% 150,175	99.8% 149,975	99.2% 149,000	98.1% 147,325	82.5% 124,000	50.2% 75,475
Agriculture	428,450	100.0% 428,325	99.9% 428,225	99.3% 425,475	92.7% 397,275	51.0% 218,700	19.6% 83,950
Grazing	295,825	100.0% 295,700	99.9% 295,600	99.5% 294,225	95.6% 282,950	61.2% 180,900	24.8% 73,225
Grazing non forest	140,075	99.9% 139,950	99.8% 139,850	99.3% 139,150	96.3% 134,875	60.5% 84,775	25.4% 35,550
Grazing Woodland forest	108,700	100.0% 108,700	100.0% 108,700	99.4% 108,025	93.1% 101,150	53.5% 58,150	17.3% 18,825
Grazing - Forest (non woodland)	47,050	100.0% 47,050	100.0% 47,050	100.0% 47,050	99.7% 46,925	80.7% 37,975	40.1% 18,850
Irrigation	132,025	100.0% 132,025	100.0% 132,025	99.0% 130,650	86.1% 113,725	28.2% 37,200	7.9% 10,375
Production native forests and plantation forests	62,900	100.0% 62,900	100.0% 62,900	100.0% 62,900	99.4% 62,550	87.0% 54,725	50.5% 31,750







