# Total vegetation cover soil protection Region:LGA Shoalhaven (C) NSW

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









Date: February 2021

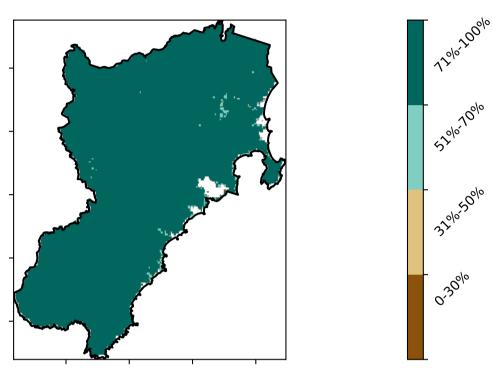
# **Vegetation Cover Feb 2021**

### Land use and forest cover

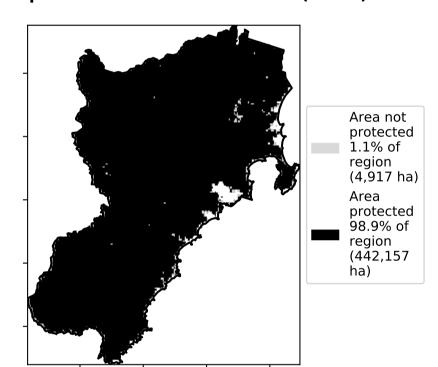
# Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments - Non-forest 2 Conservation and natural environments - Woodland forest 3 Conservation and natural environments -Non-Woodland forest 4 Agriculture - Grazing - Non-forest 5 Agriculture - Grazing - Woodland forest 6 Agriculture - Grazing - Non-woodland forest 7 Agriculture - Grazing - Irrigated 8 Agriculture - Cropping - Non-irrigated 9 Agriculture - Cropping - Irrigated 10 Agriculture - Horticulture - Non-irrigated 11 Agriculture - Horticulture - Irrigated 12 Production native forests and plantation forests 13 Other uses

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

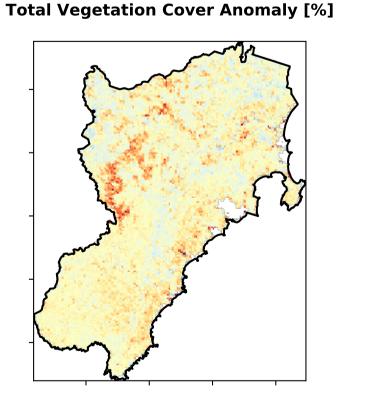
# **Total Vegetation Cover [%]**



% Area protected from water erosion (>70%)



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

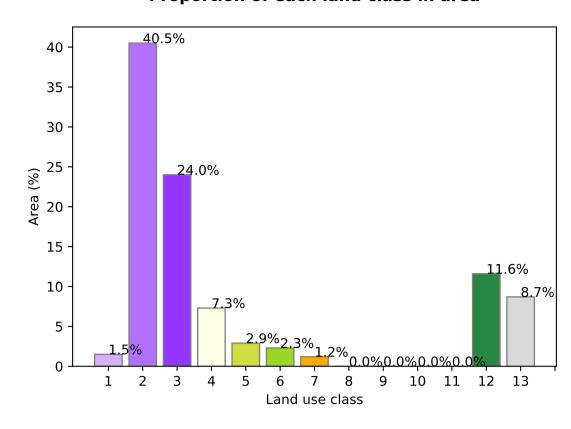


- 20 10 -10-20

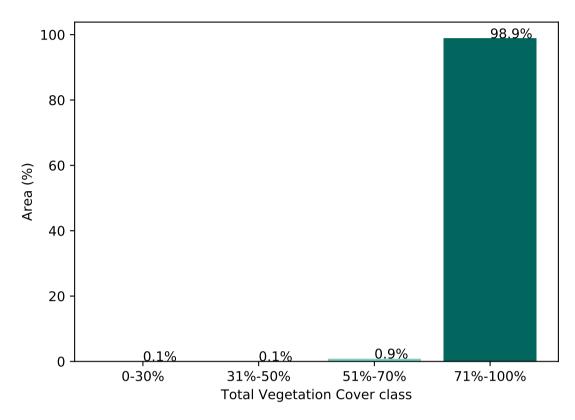
# Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

# **National** Landcare

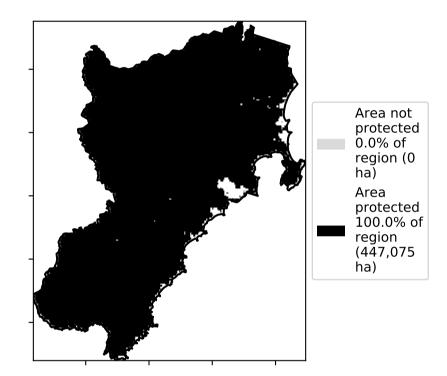
# **Proportion of each land class in area**

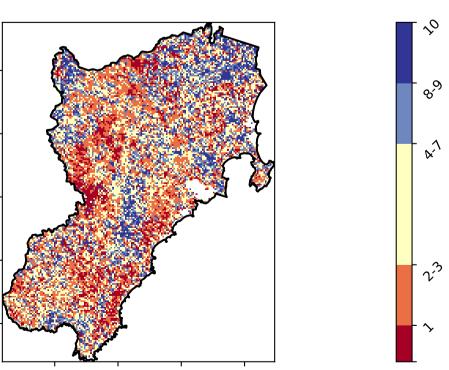


**Proportion of vegetation cover class in area** 



% Area protected from wind erosion (>50%)

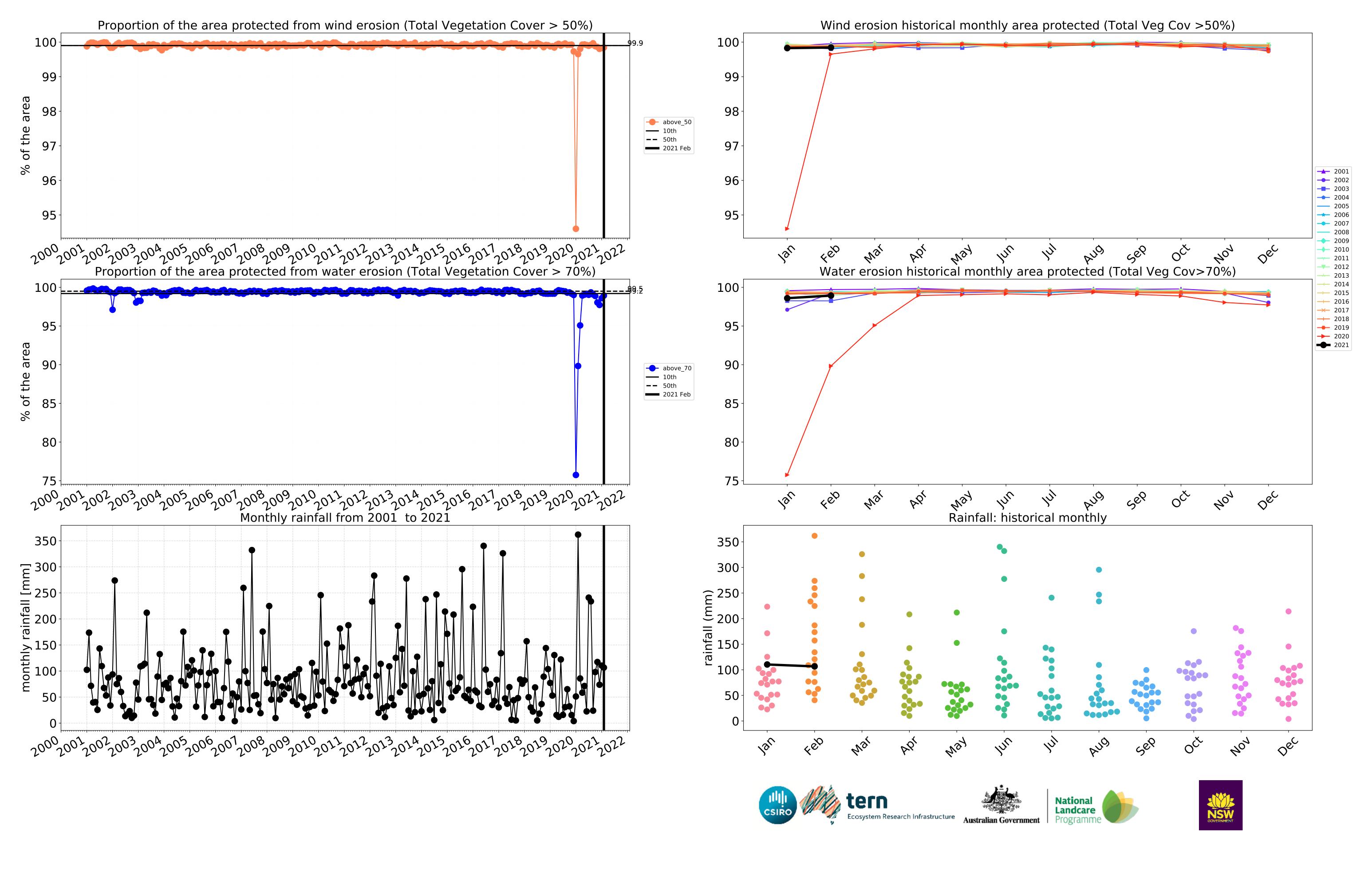


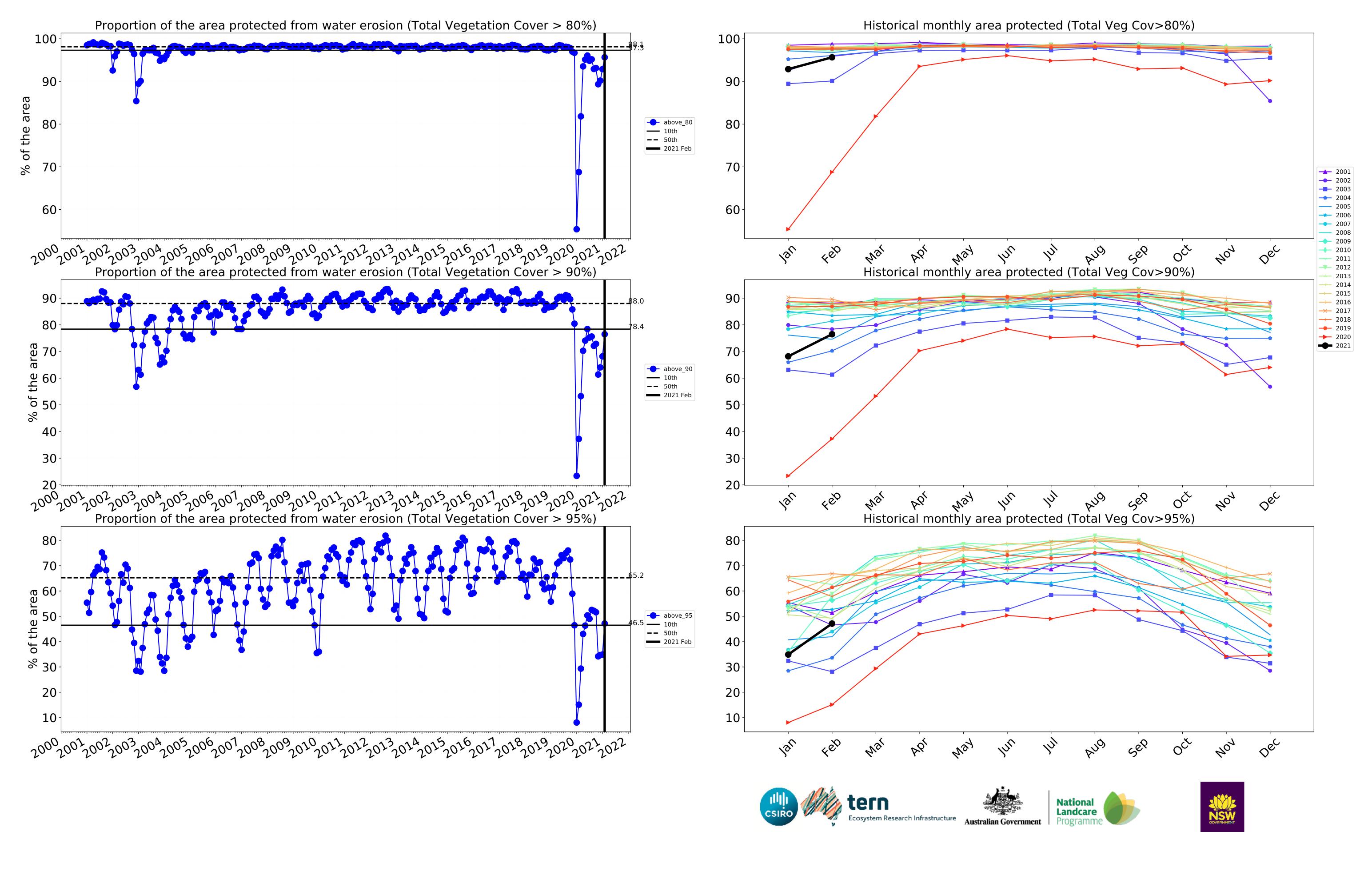








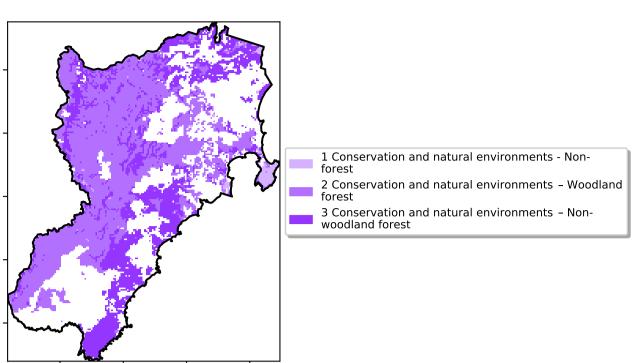


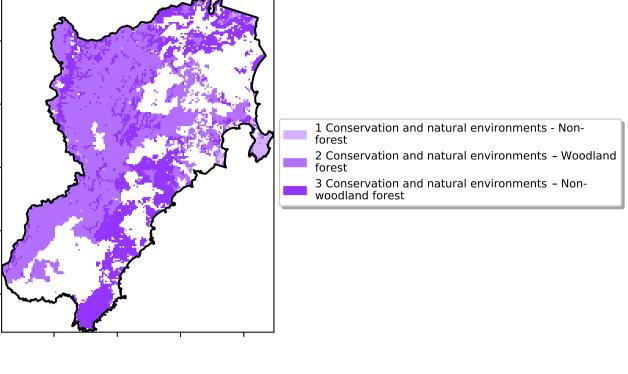


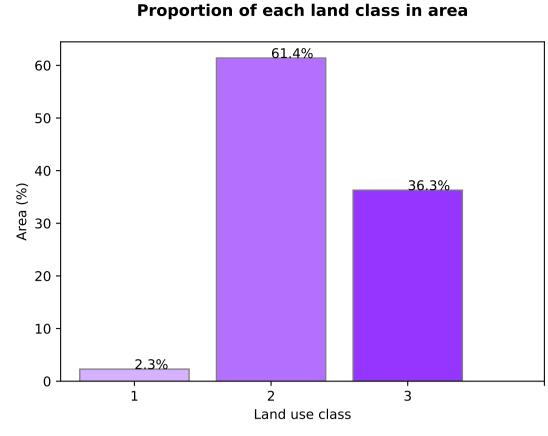
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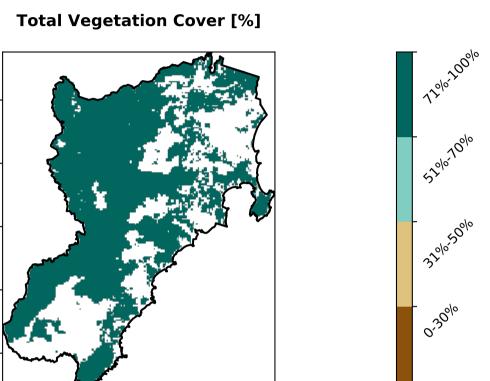
# **Conservation and natural environments**

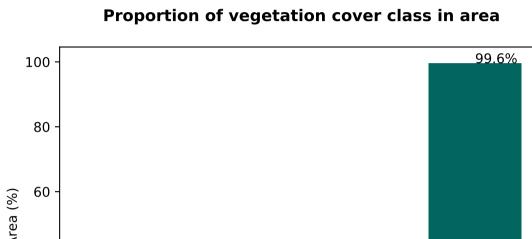
# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)









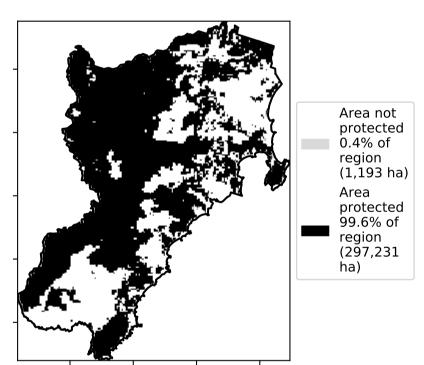


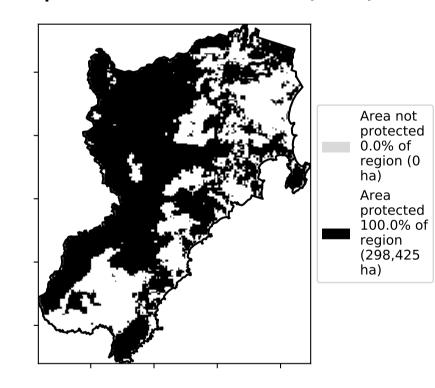
# % Area protected from water erosion (>70%)

Land use and forest cover



31%-50%



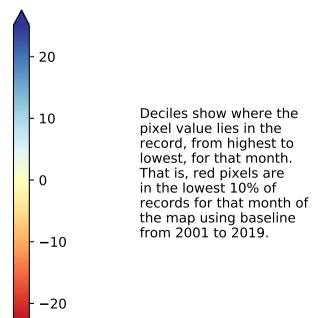


51%-70%

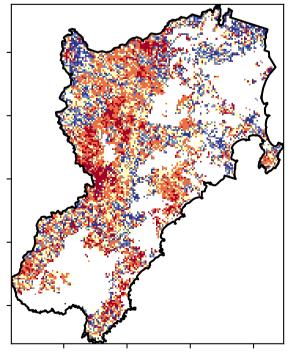
71%-100%

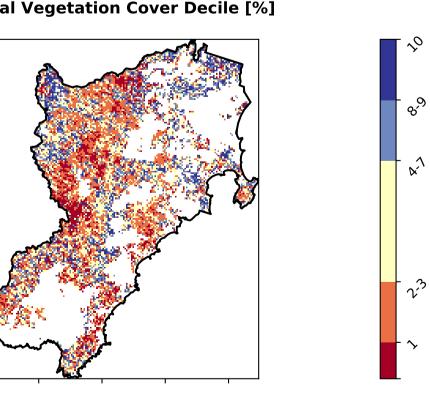
# **Total Vegetation Cover Anomaly [%]**

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



**Total Vegetation Cover Decile [%]** 













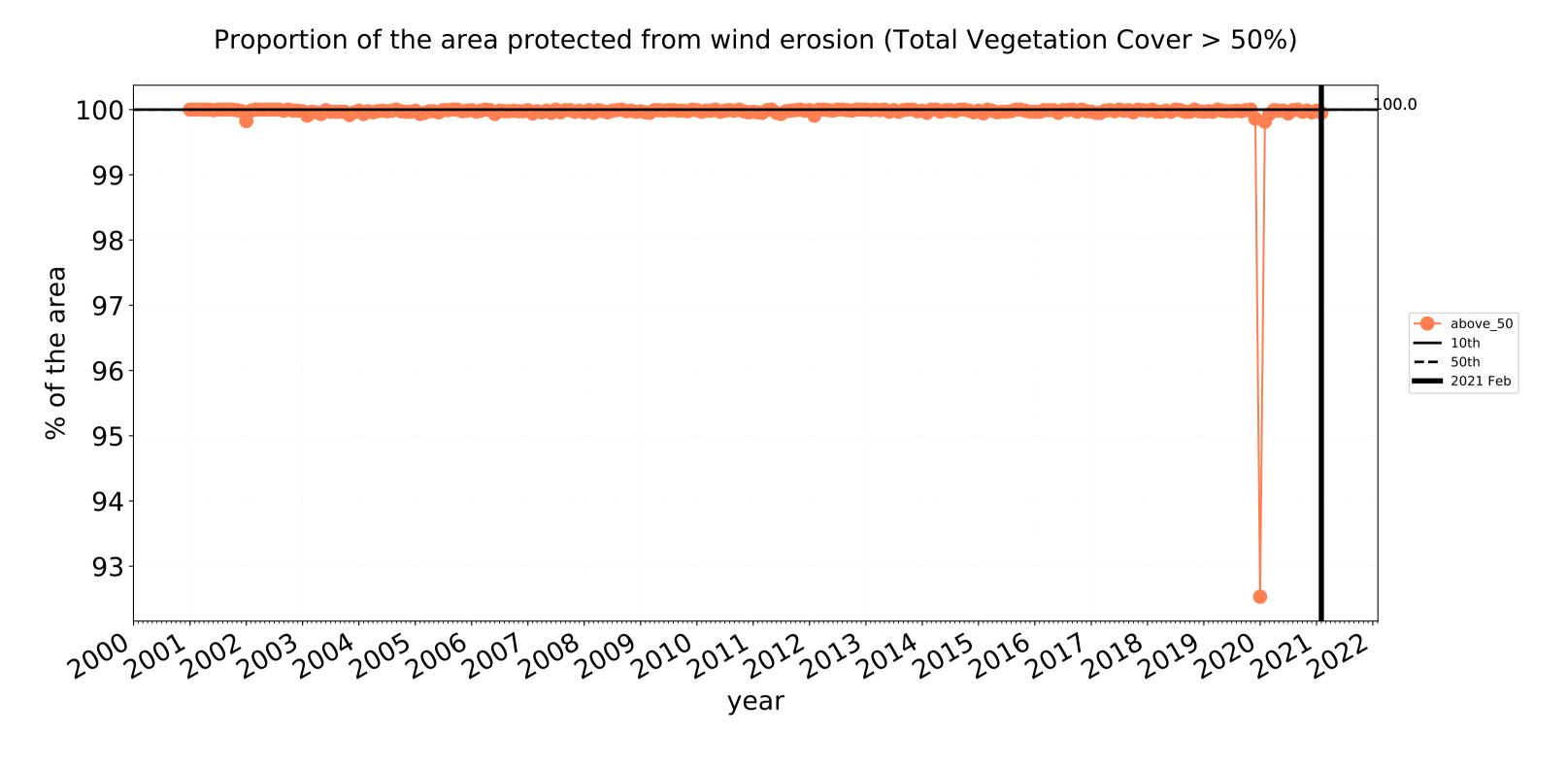
40

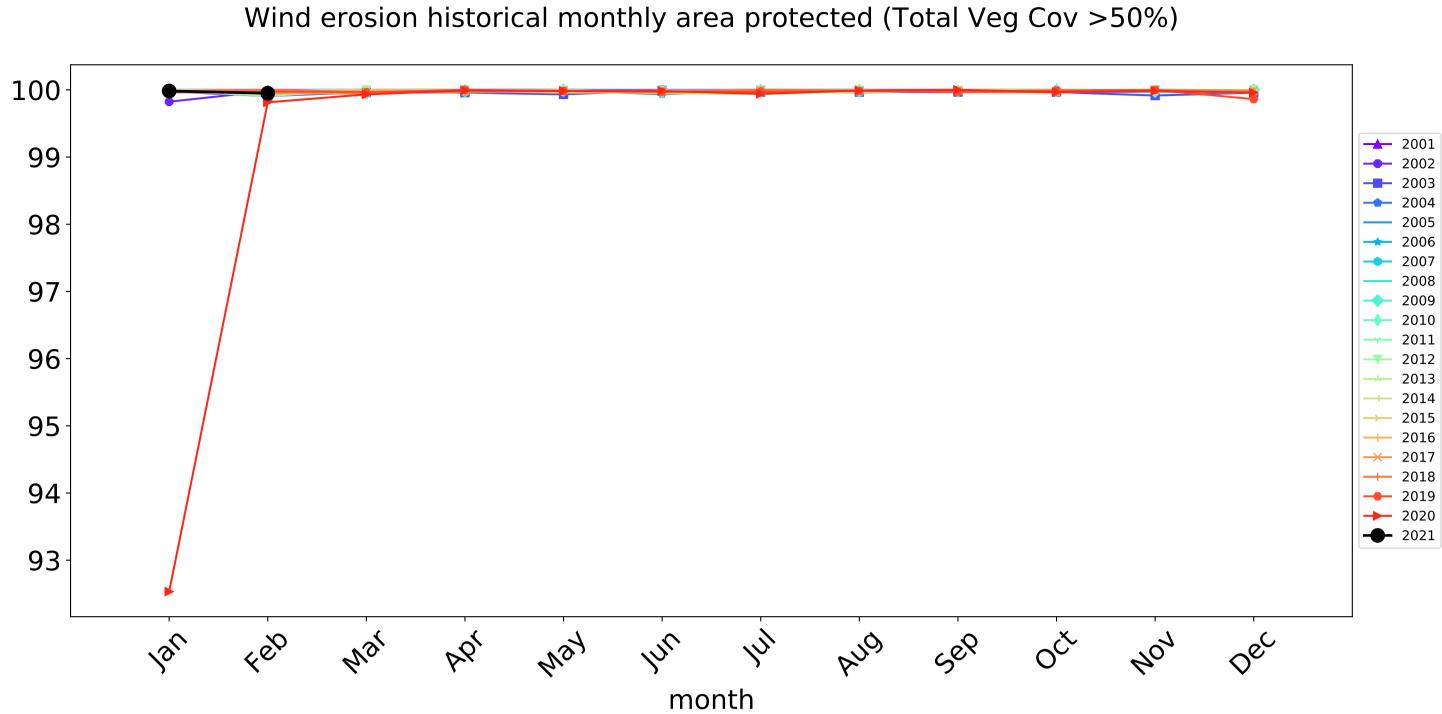
20

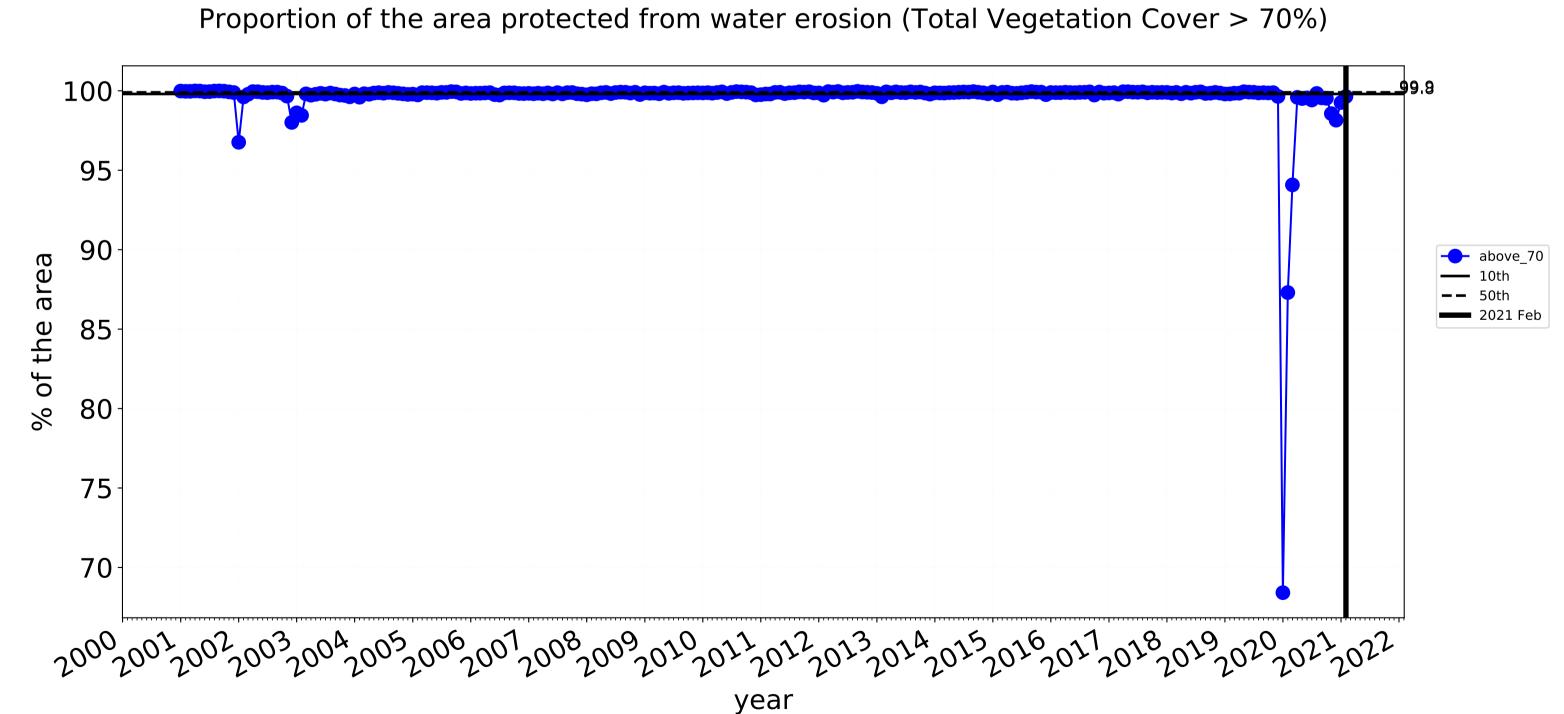
0.0% 0-30%

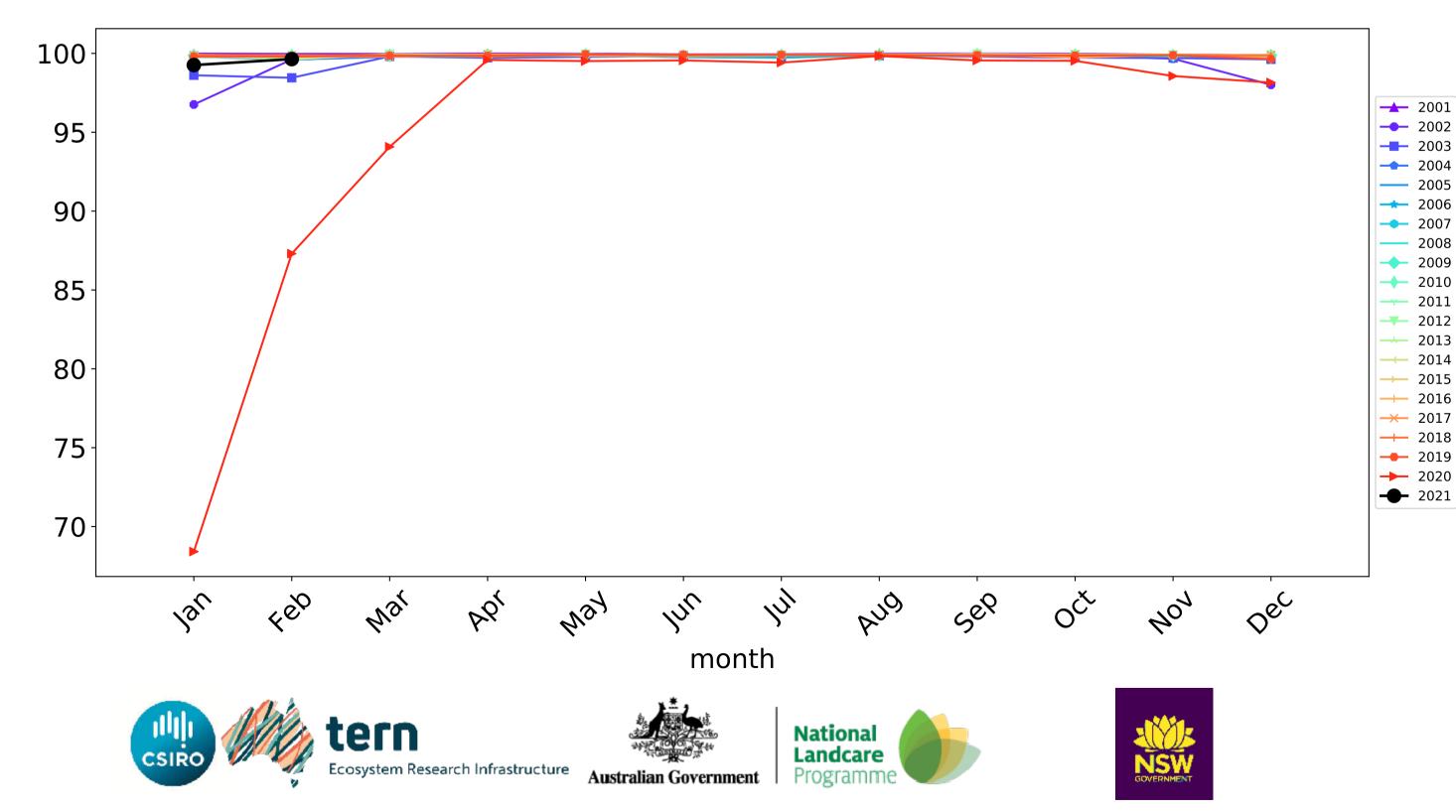


# **Conservation and natural environments timeseries**

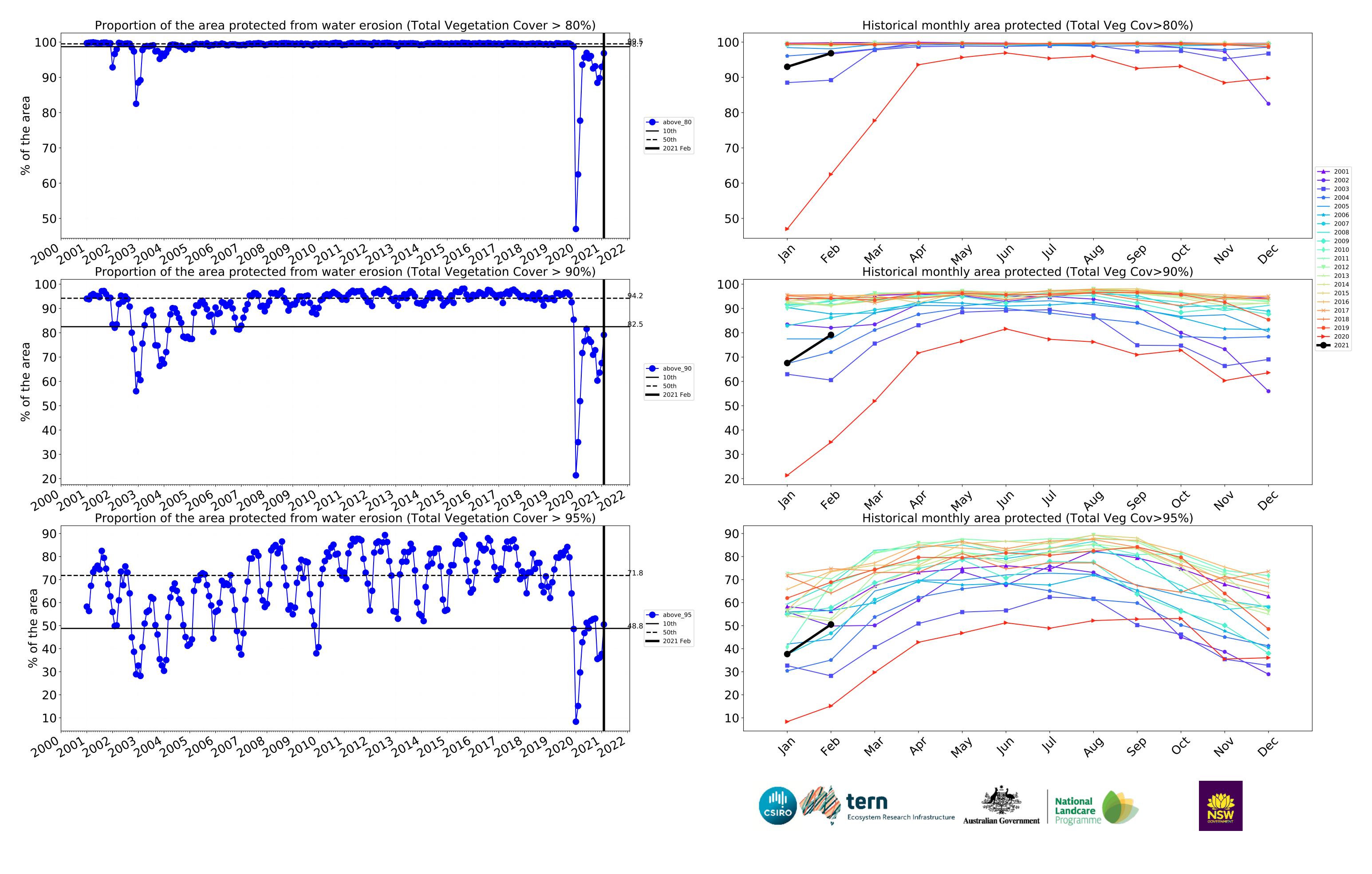








Water erosion historical monthly area protected (Total Veg Cov>70%)



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# **Conservation and natural environments 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)

Anomaly show how many percetage points each

pixel is from

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

the mean. That

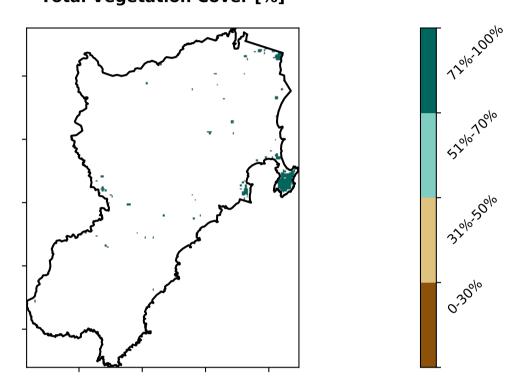
is only for the month of the map

using baseline from 2001 to 2019.

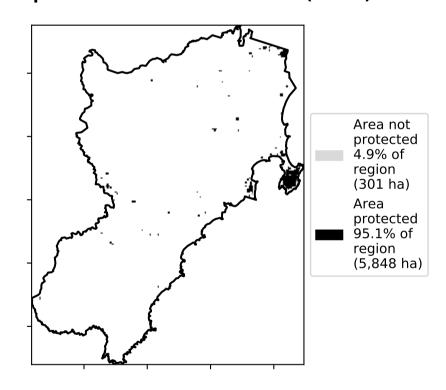
# 1 Conservation and natural environments - Nonforest

# **Total Vegetation Cover [%]**

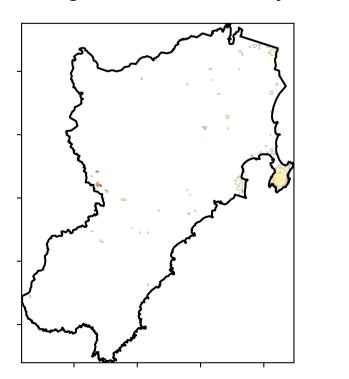
Land use and forest cover



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

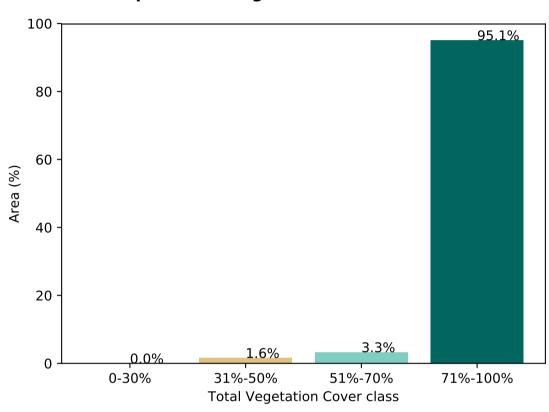


# **Total Vegetation Cover Anomaly [%]**

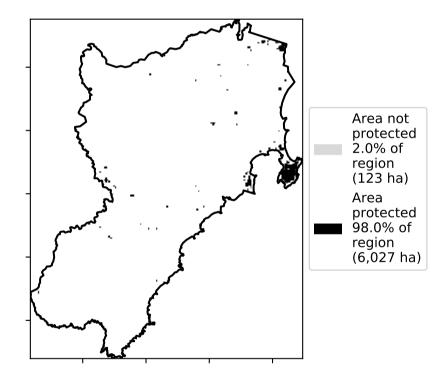


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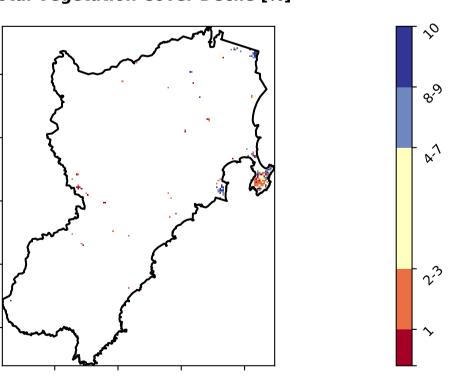
# **Proportion of vegetation cover class in area**



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



# Total Vegetation Cover Decile [%]















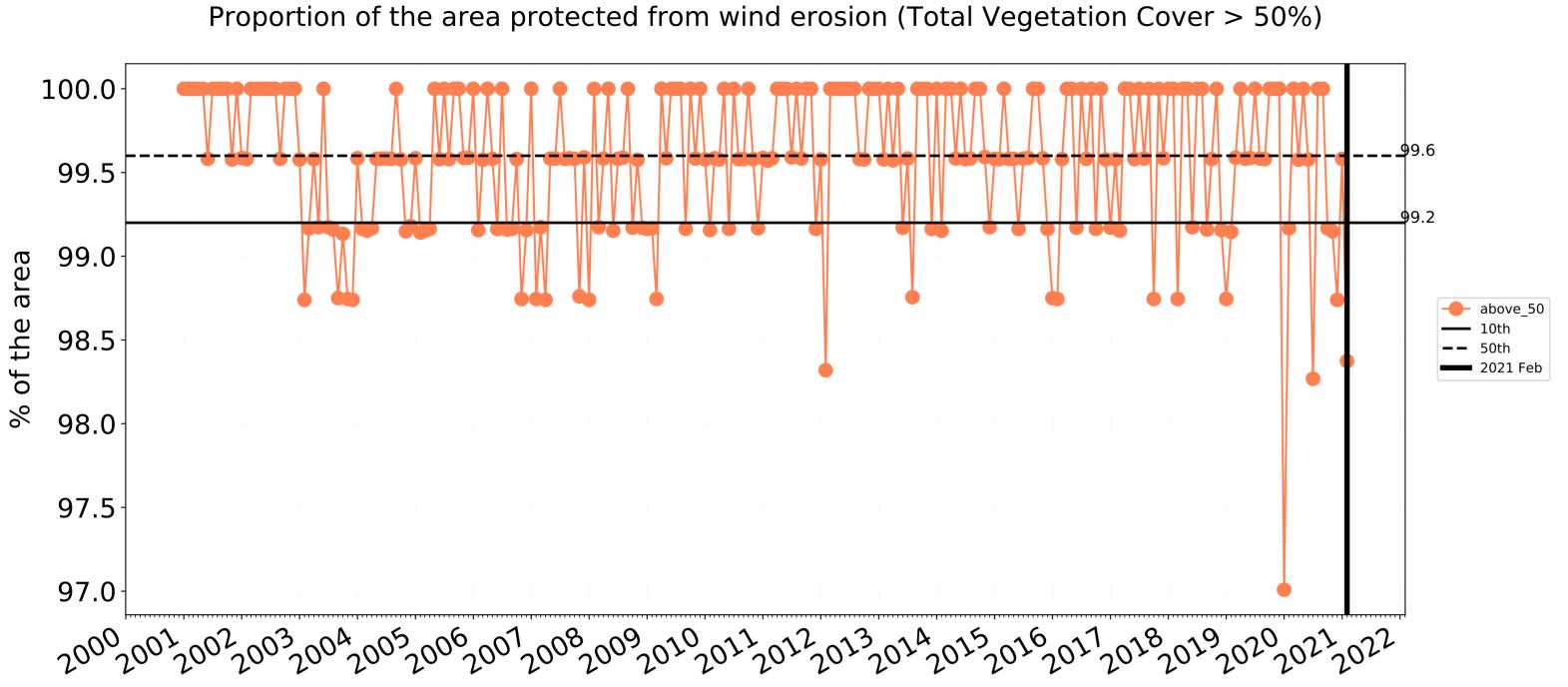
- 20

- 10

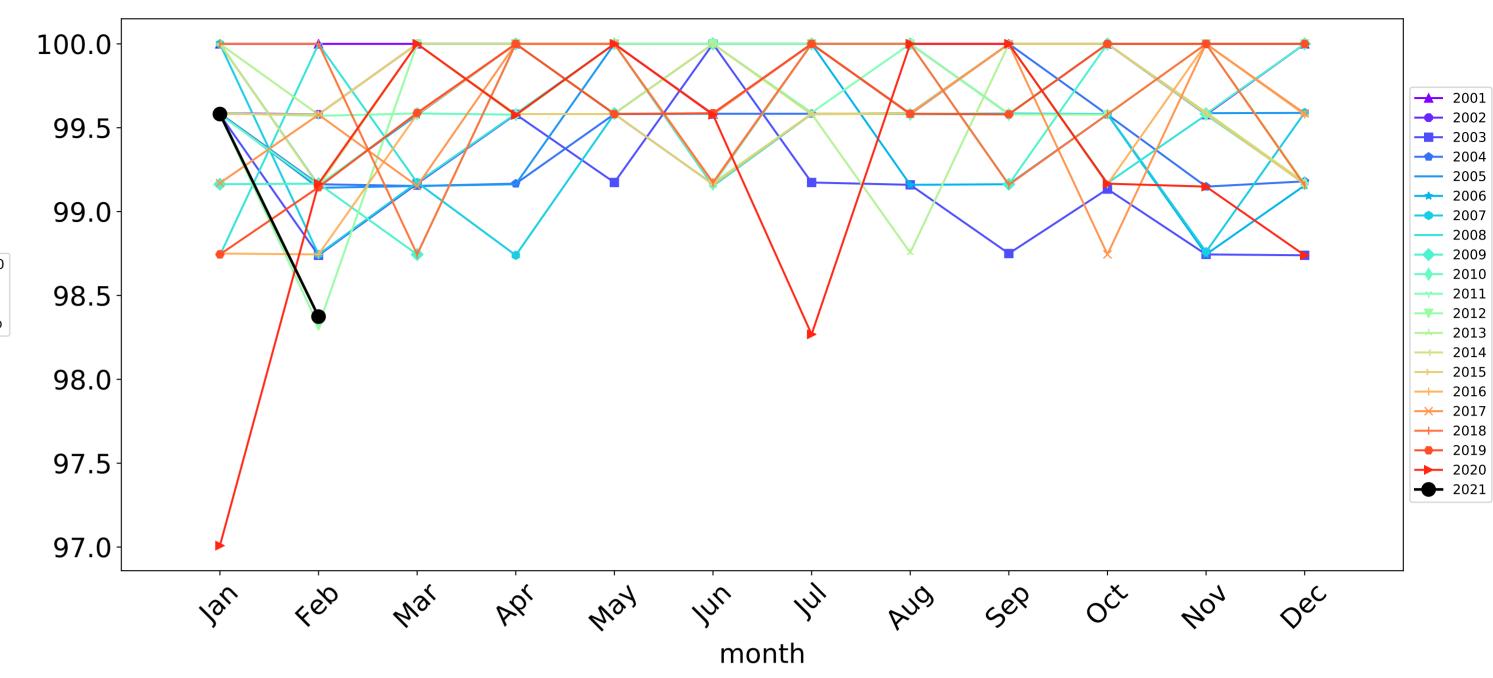
-10

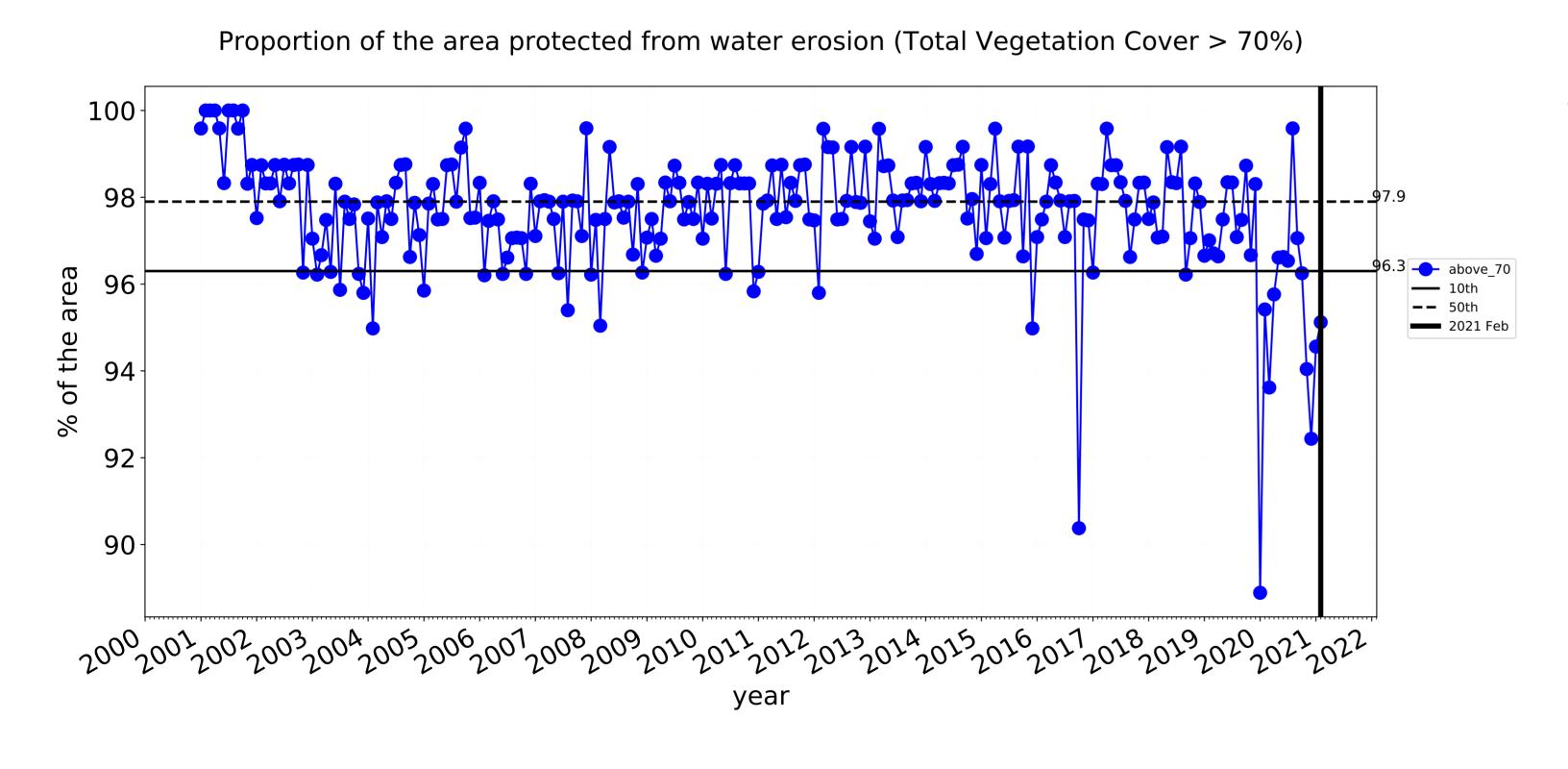
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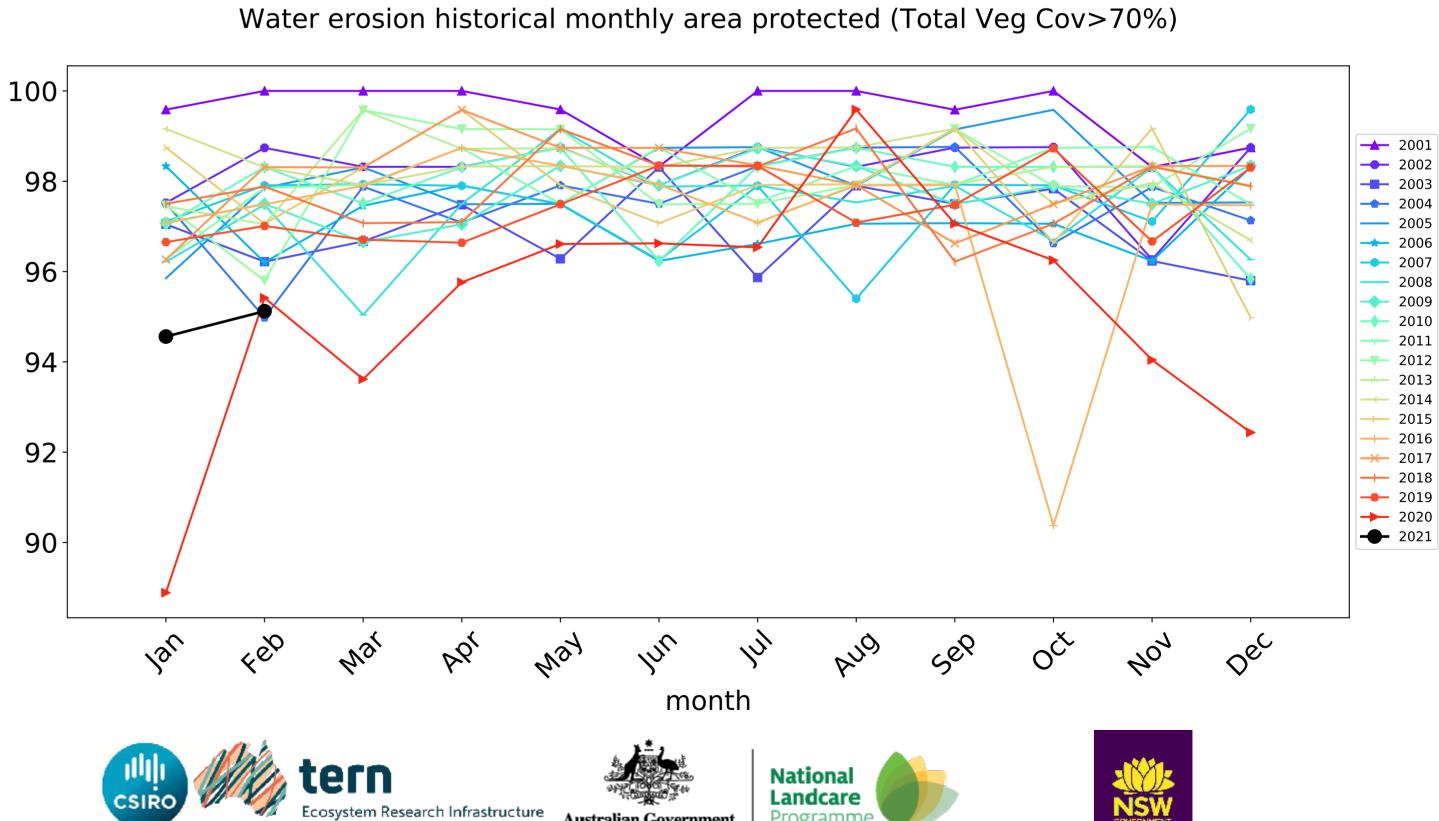
# **Conservation and natural environments non forest timeseries**

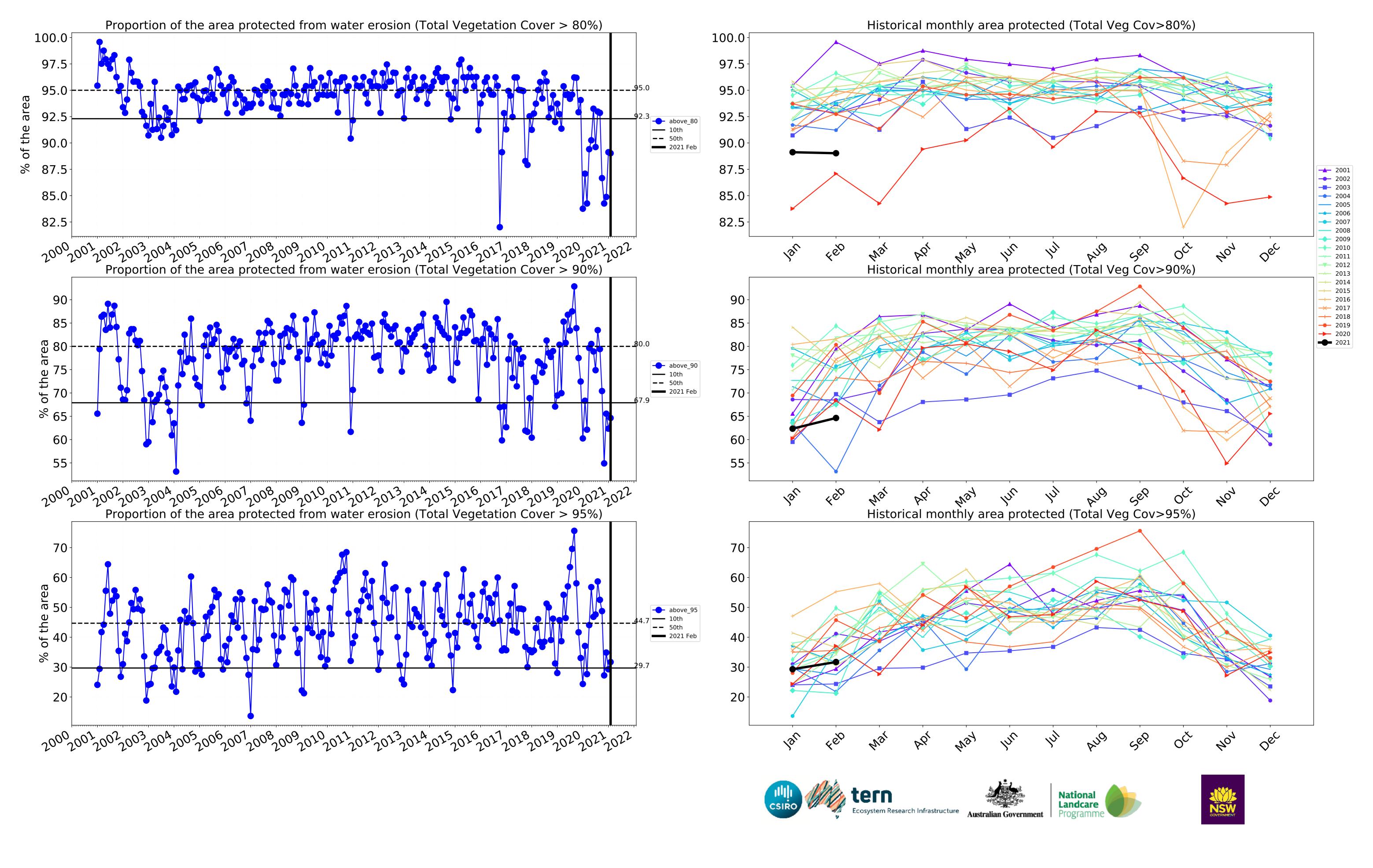


# Wind erosion historical monthly area protected (Total Veg Cov >50%)









# **Conservation and natural environments 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)

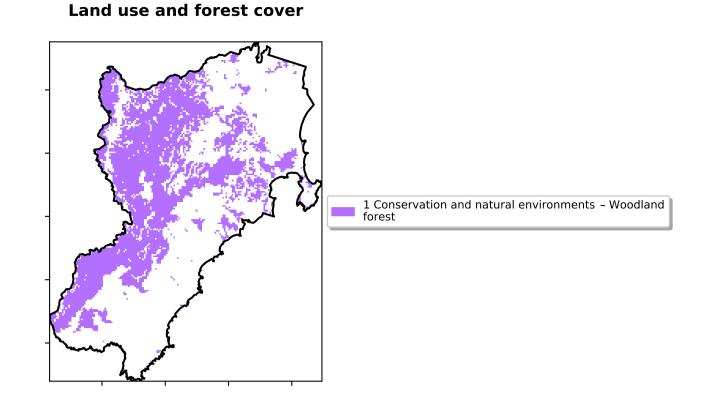
Anomaly show how many percetage points each

pixel is from

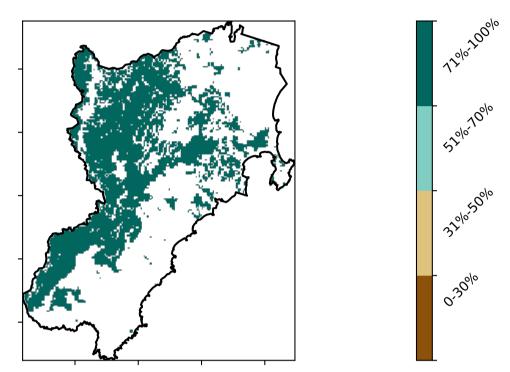
is, red pixels are about 20% lower than the mean of that

the mean. That

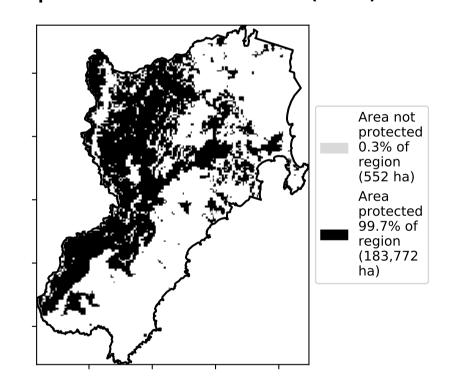
pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



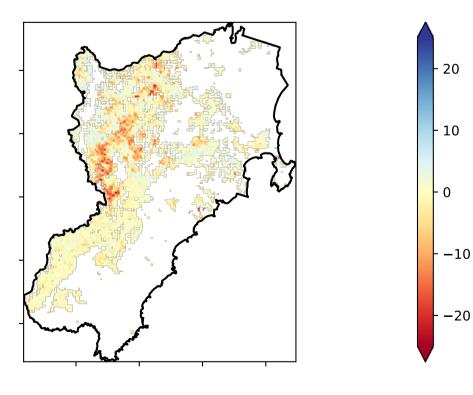
# **Total Vegetation Cover [%]**



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

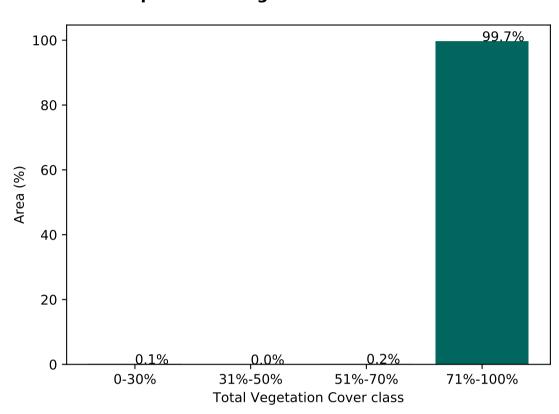


# **Total Vegetation Cover Anomaly [%]**

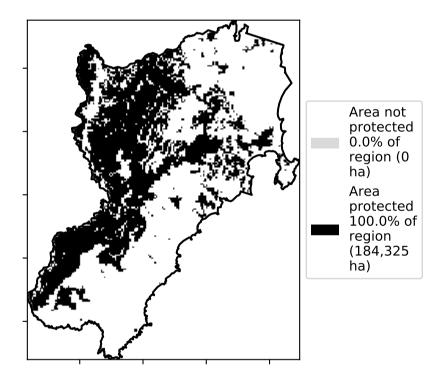


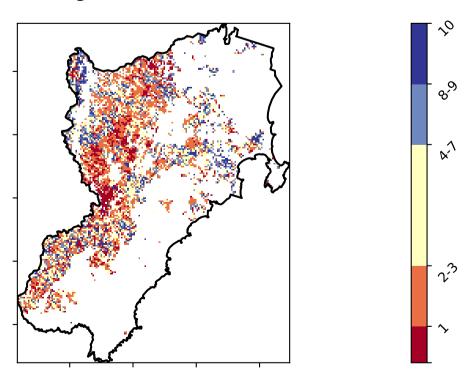
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





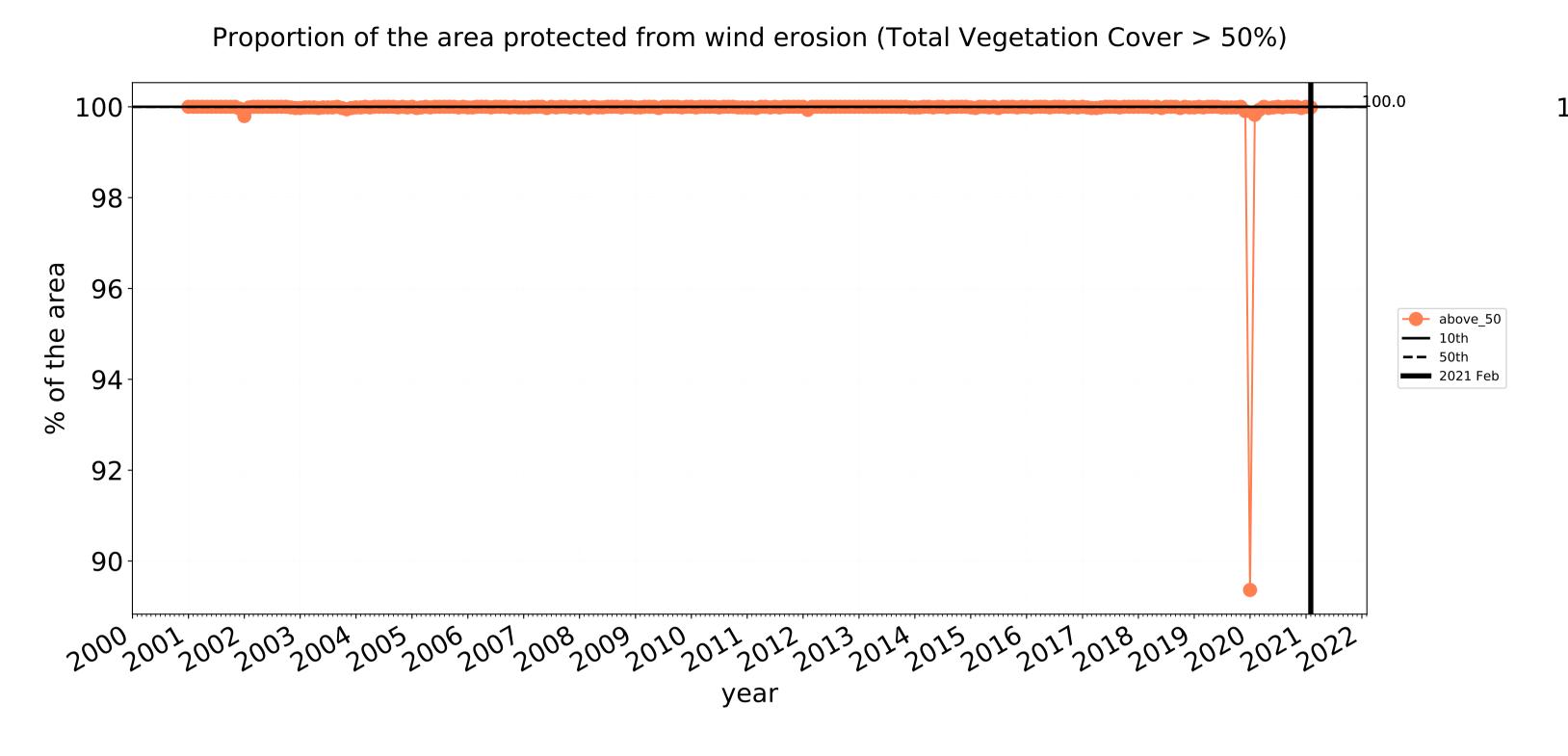


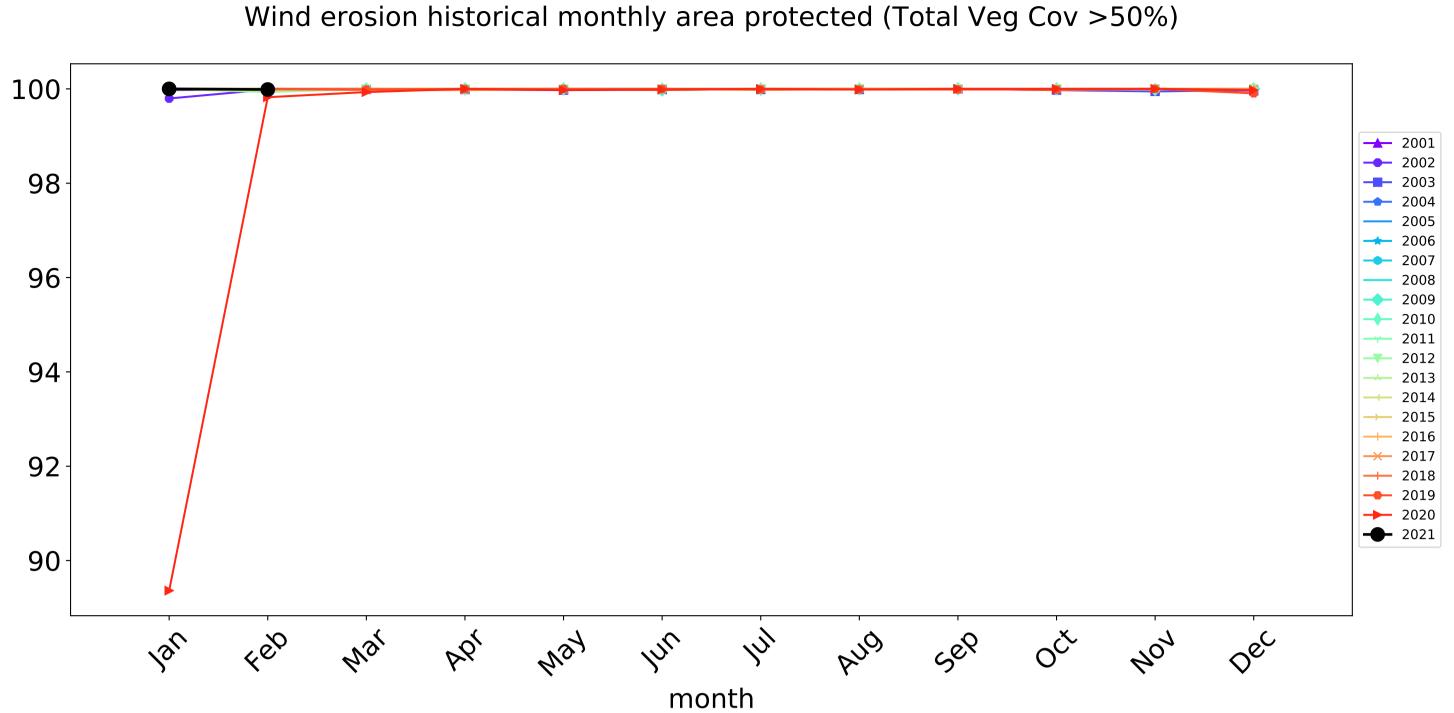


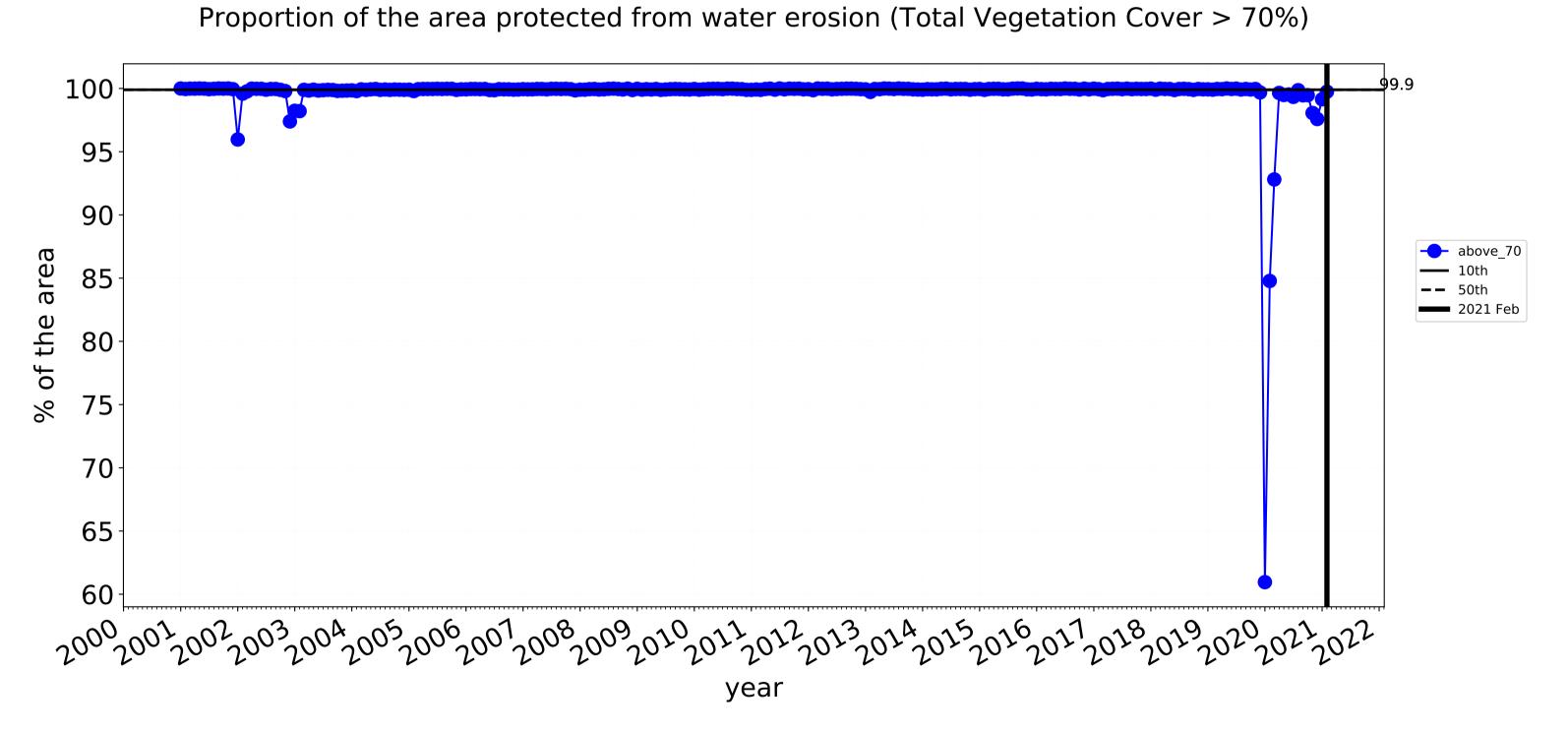


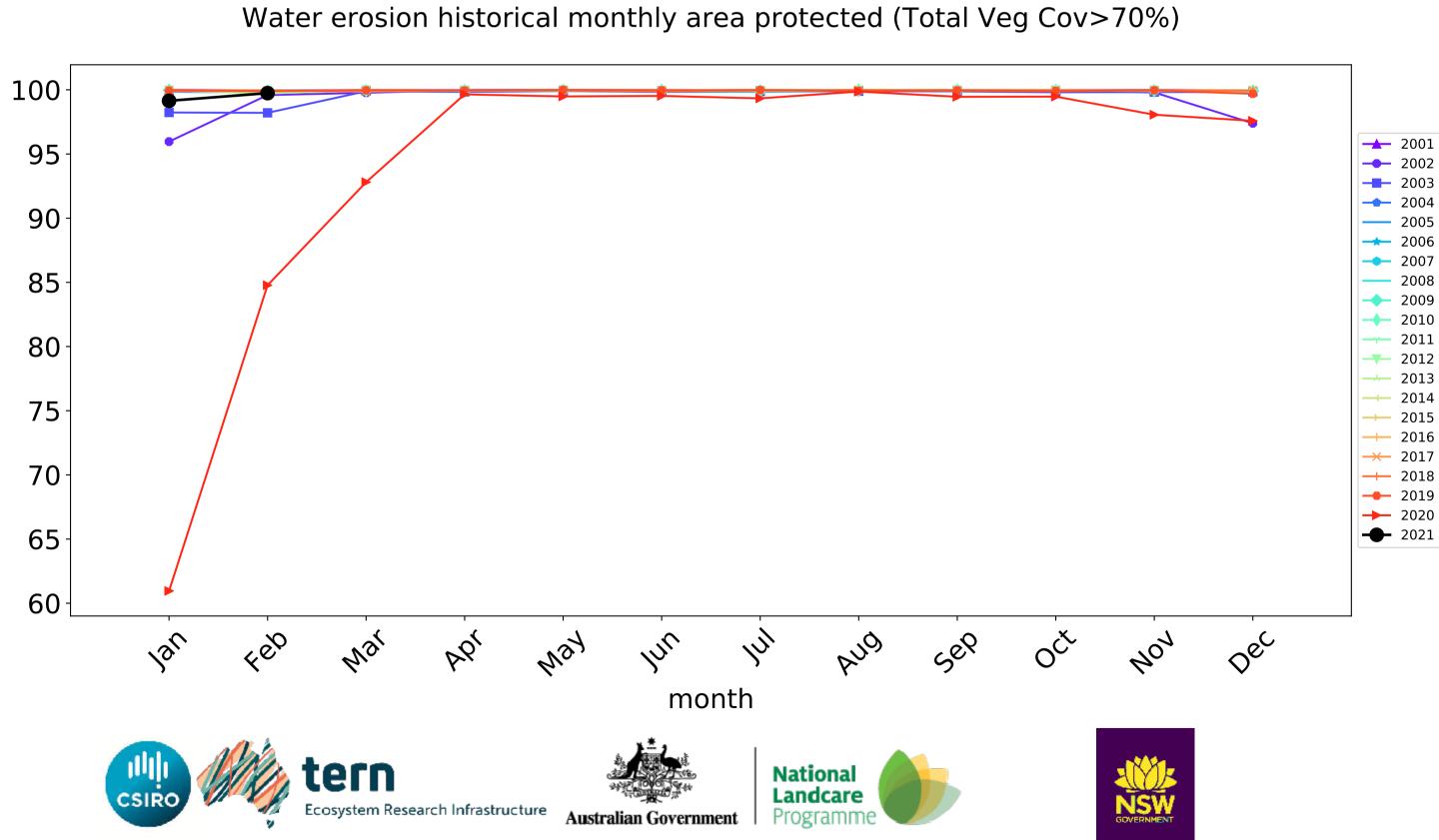


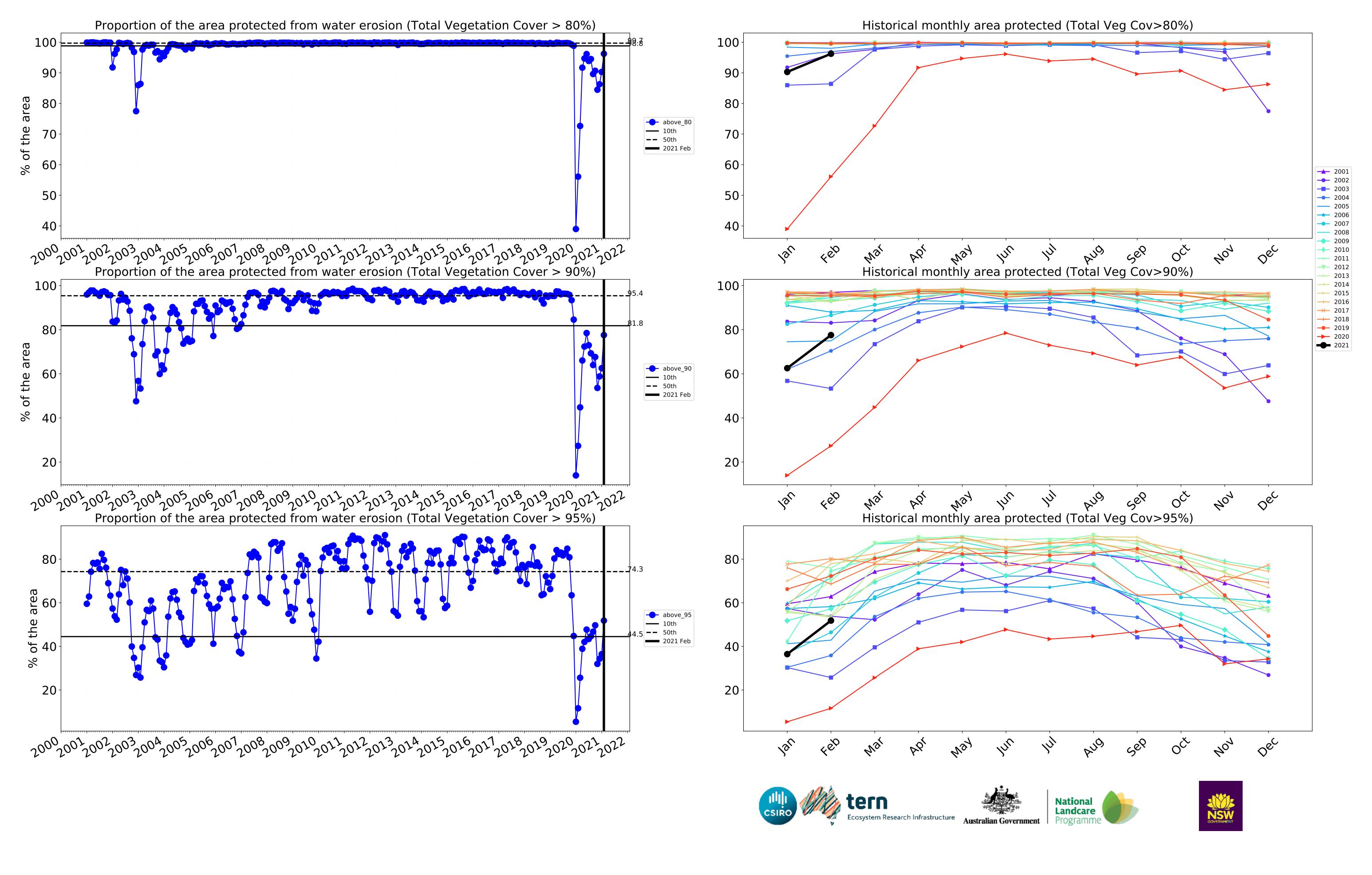
# **Conservation and natural environments Woodland forest timeseries**







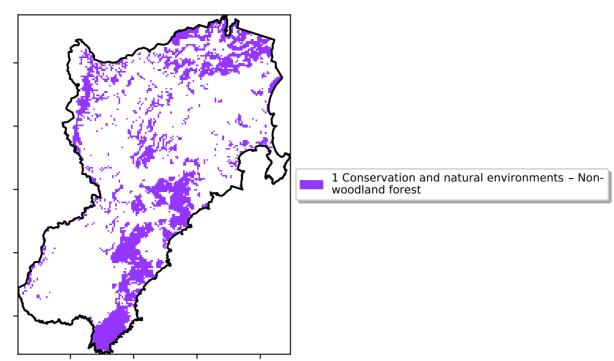




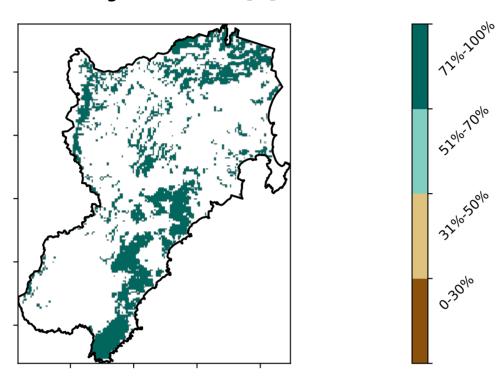
# **Conservation and natural environments Forest (non woodland)**

# Land use and forest cover

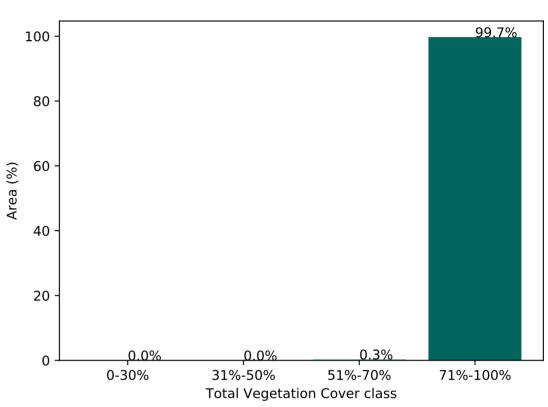
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



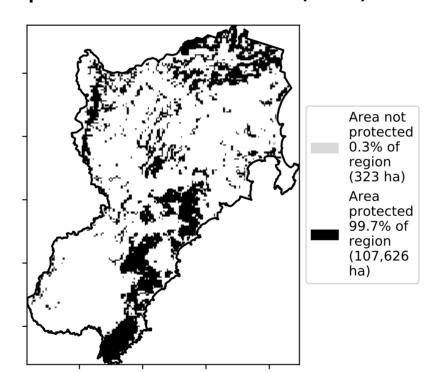
# **Total Vegetation Cover [%]**



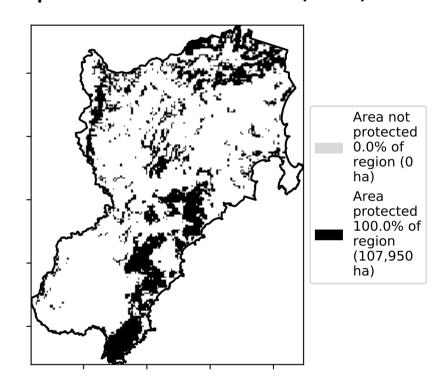
Proportion of vegetation cover class in area



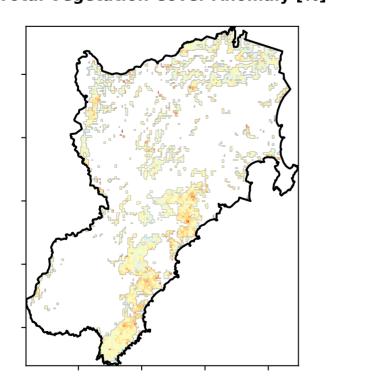
# % Area protected from water erosion (>70%)

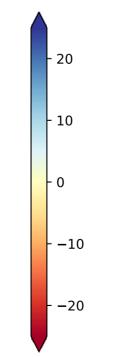


% Area protected from wind erosion (>50%)



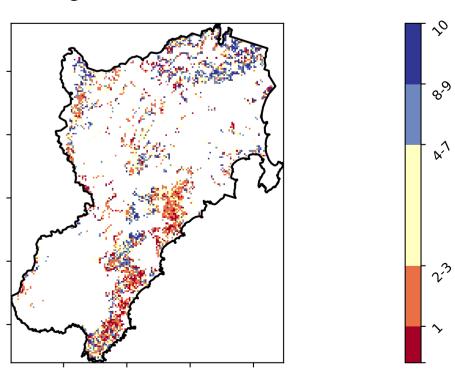
# Total Vegetation Cover Anomaly [%]





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.

Total Vegetation Cover Decile [%]



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.

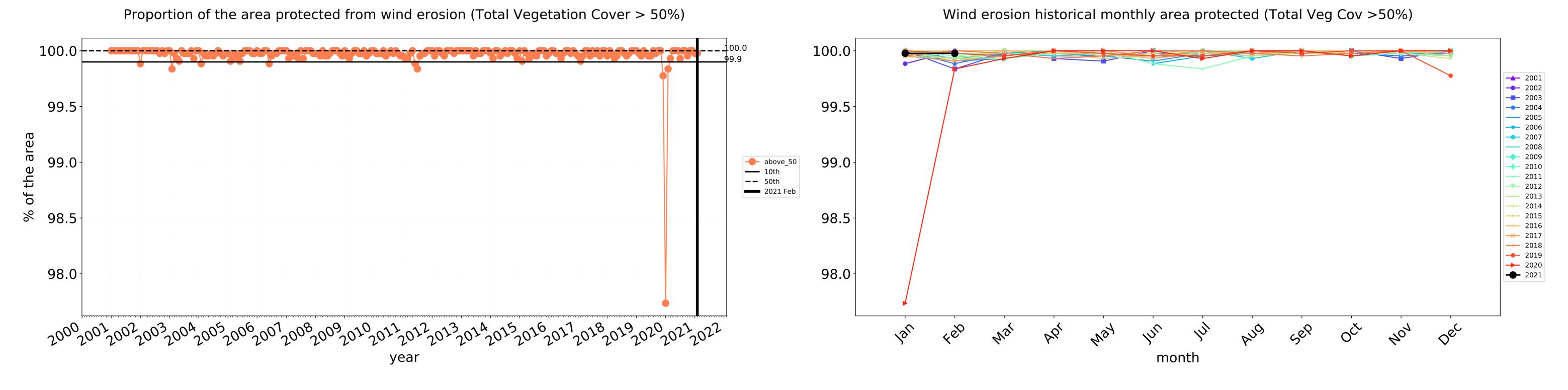


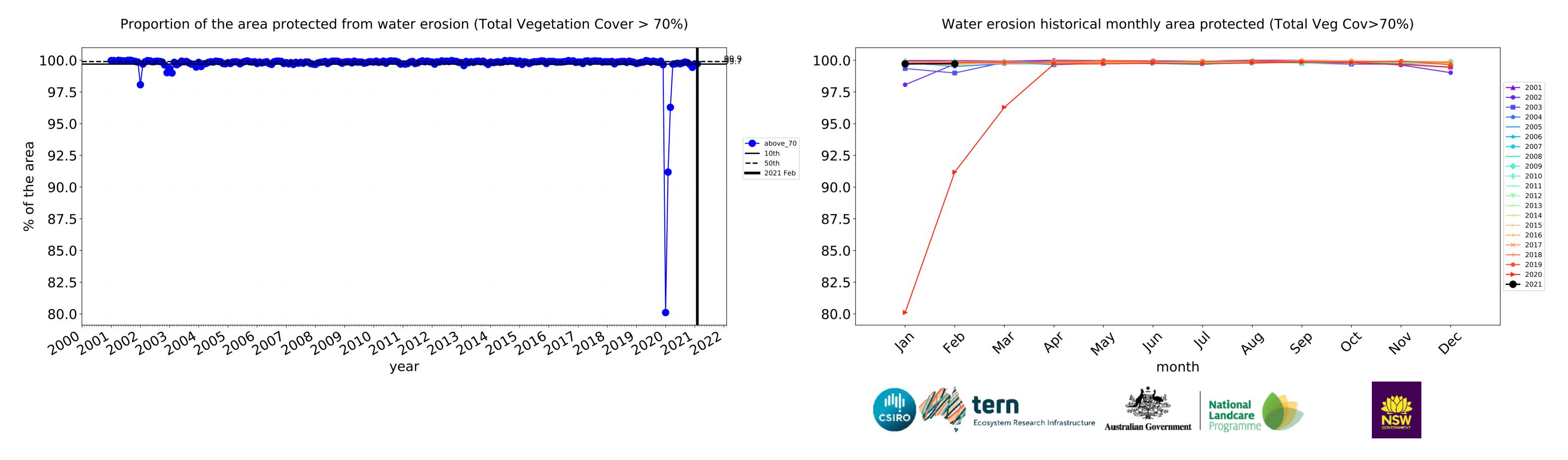


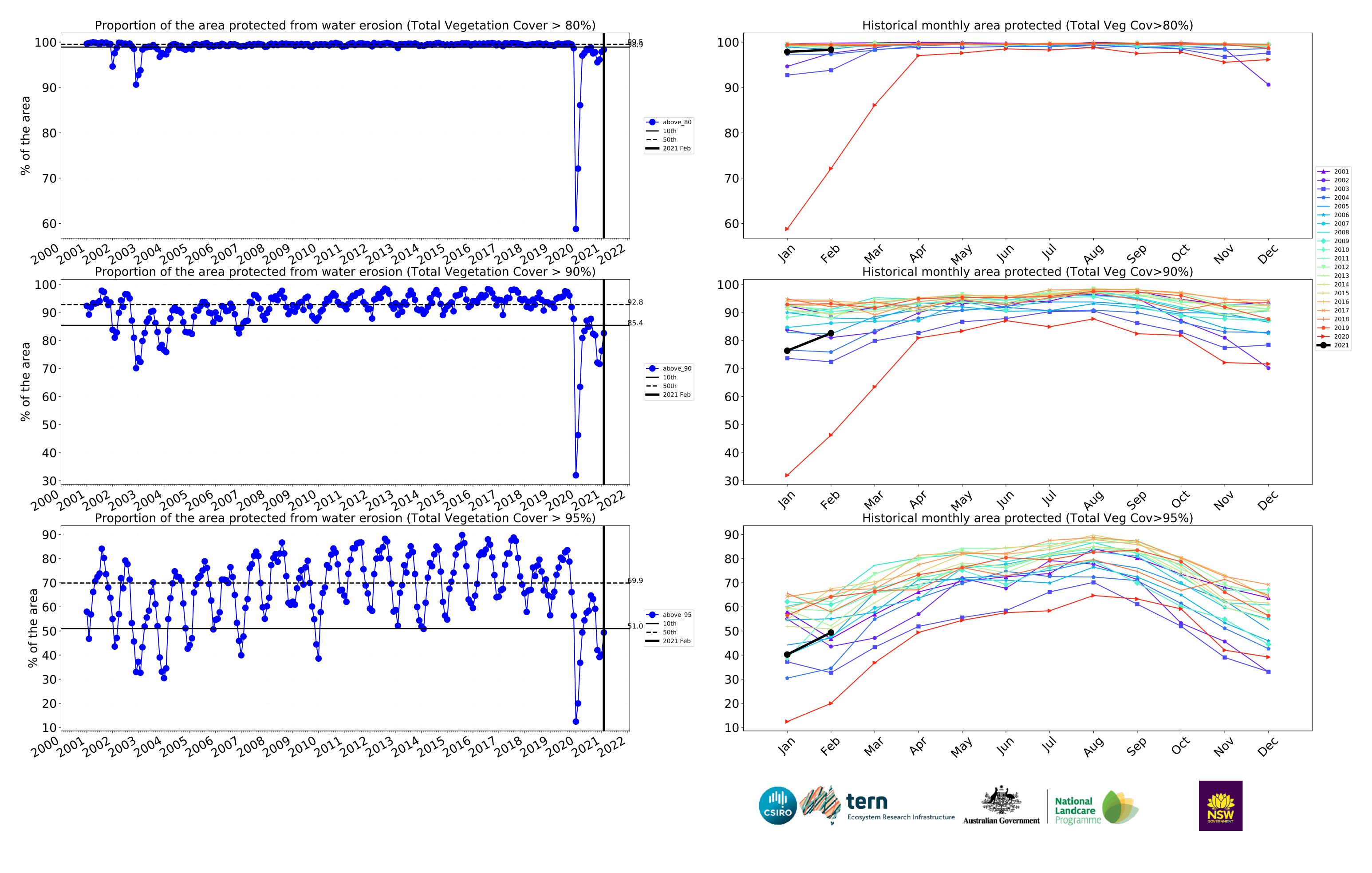




# Conservation and natural environments Forest (non woodland) timeseries







# **Agriculture**

# 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

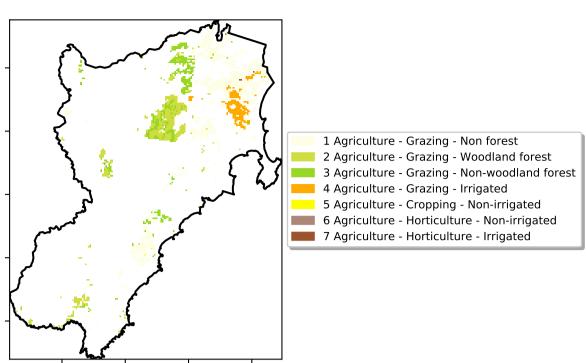
is, red pixels are about 20% lower than the mean of that

the mean. That

pixel. The mean

using baseline from 2001 to 2019.

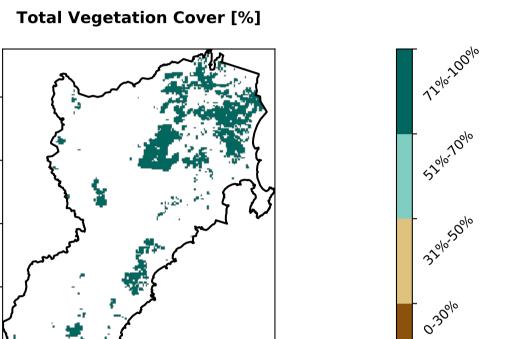
is only for the month of the map

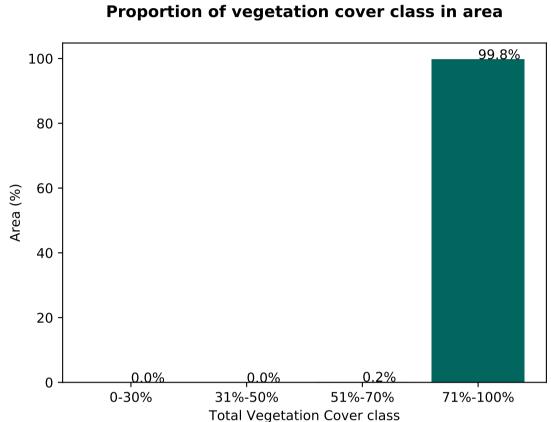


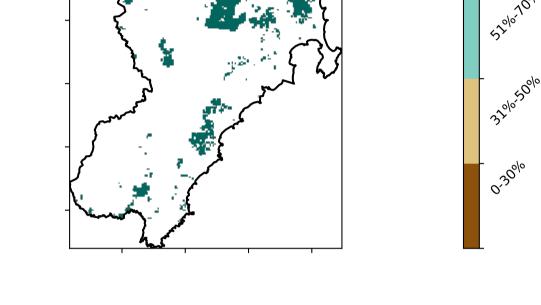
Land use and forest cover

# 53.2% 50 40 Area (%) 0 21.0% 20 17.0% 10 8.4% Land use class

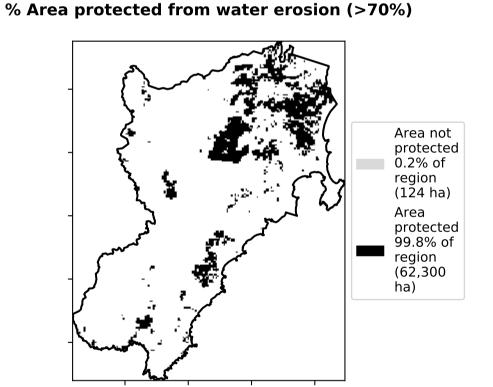
Proportion of each land class in area

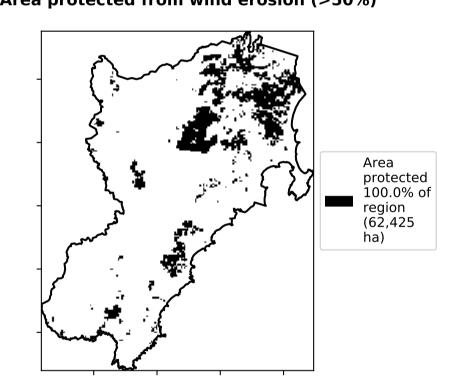






% Area protected from wind erosion (>50%)





**Total Vegetation Cover Anomaly [%]** 

- 20 - 10 -10**-**20

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 [%]** 

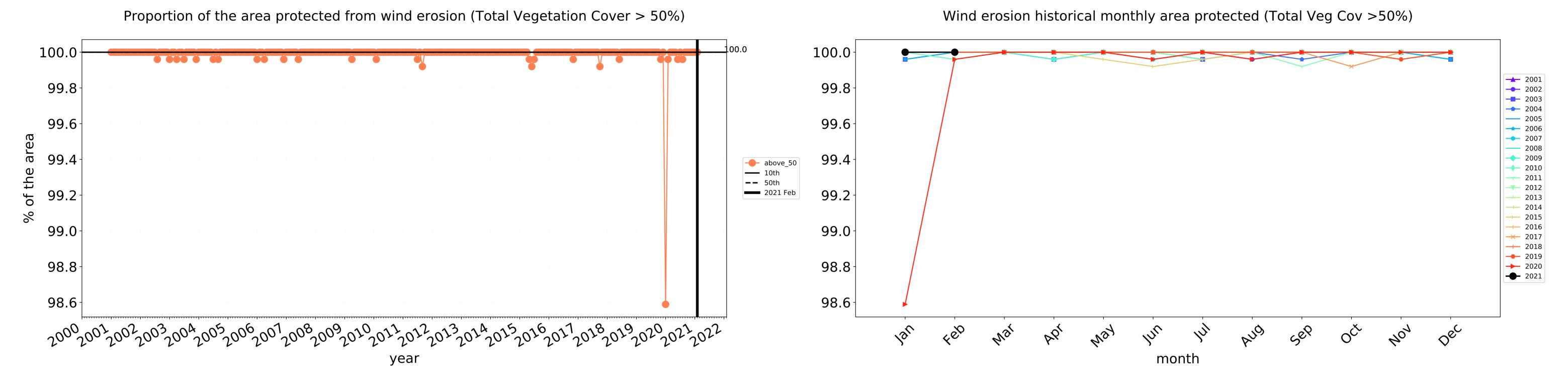


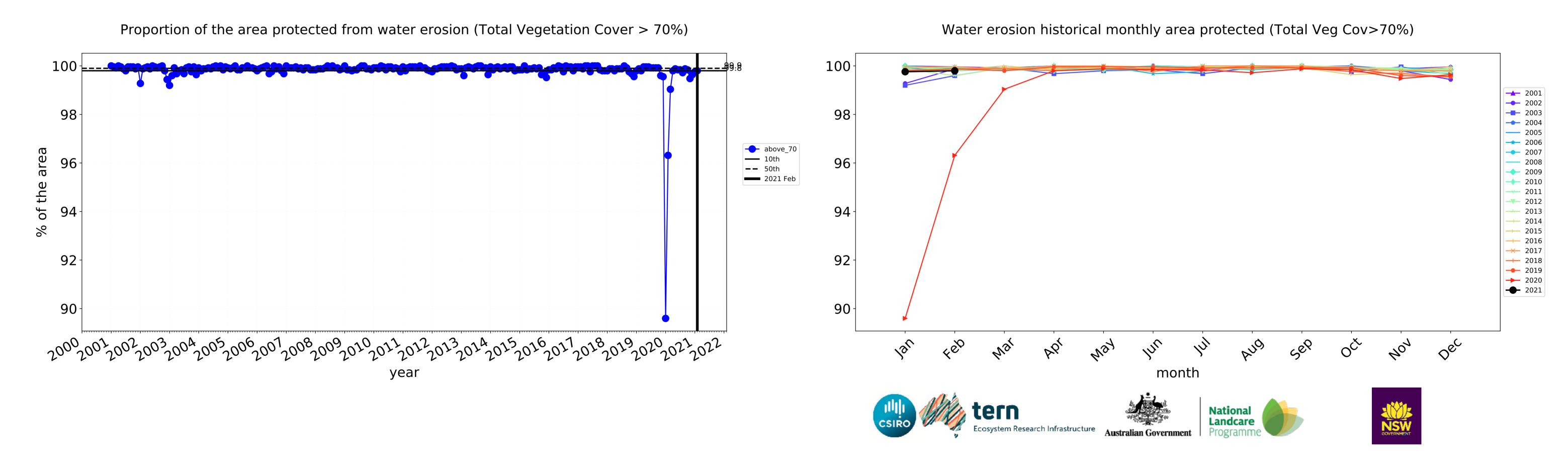


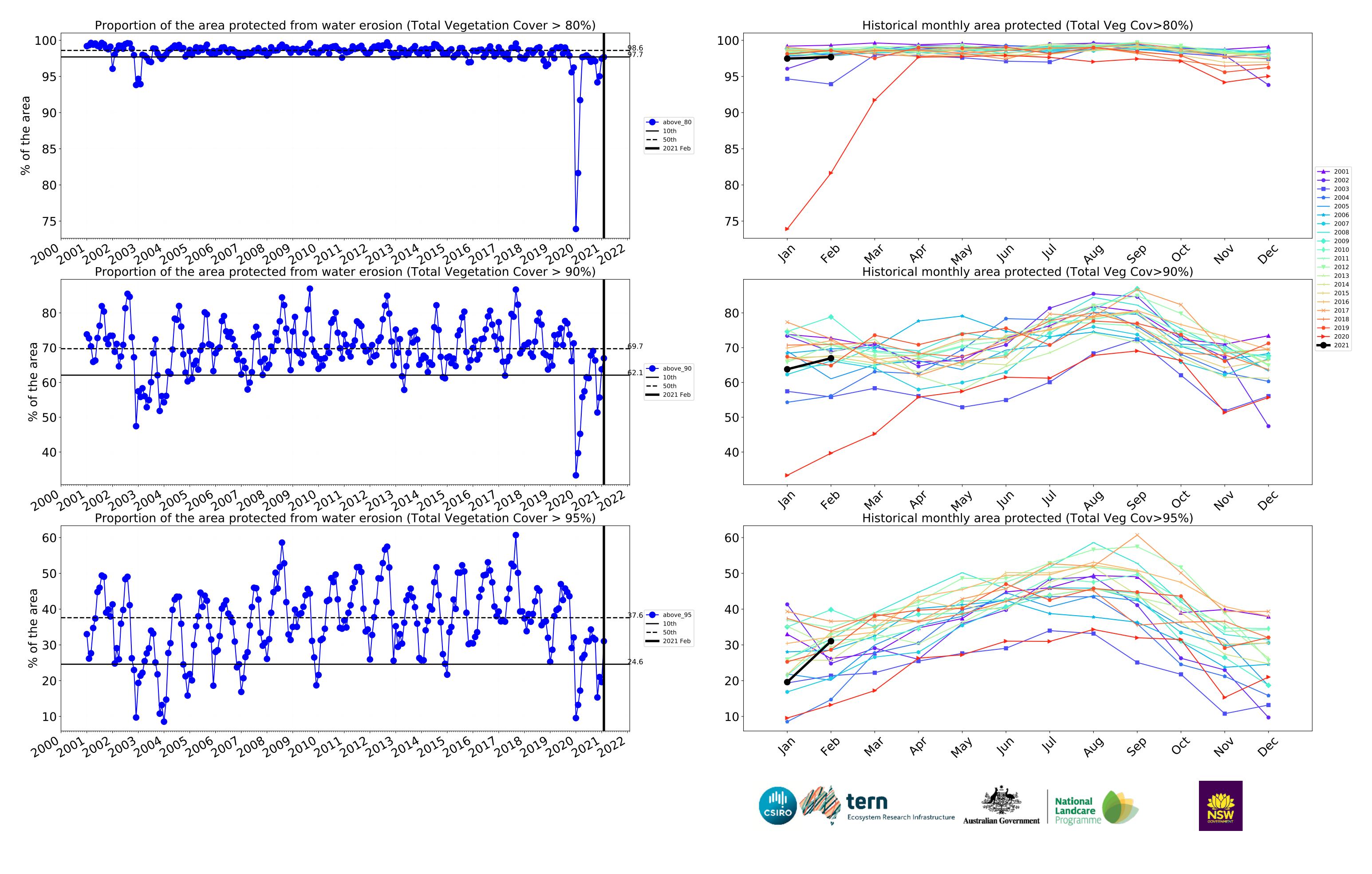




# **Agriculture timeseries**







# **Grazing**

# 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

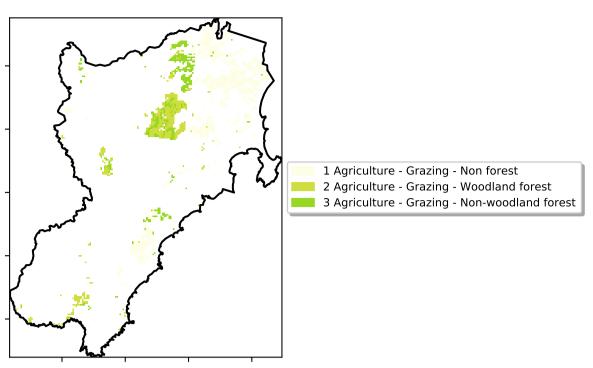
pixel is from

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

the mean. That

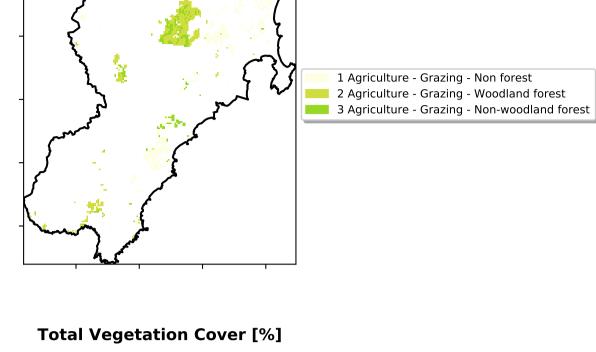
is only for the month of the map

using baseline from 2001 to 2019.

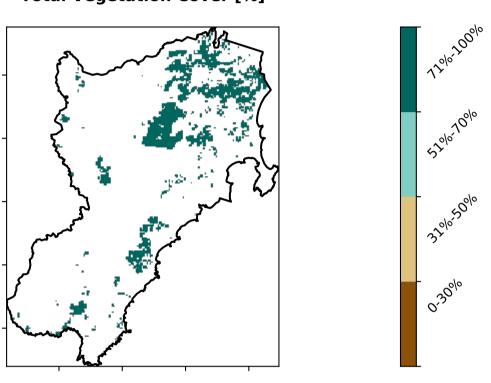


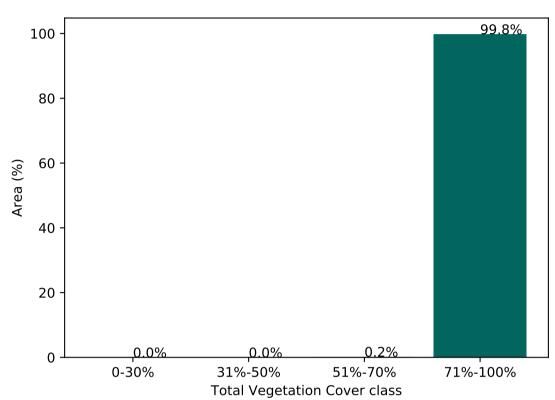
# 60 58.3% 50 40 Area (%) & 23.1% 20 18.6% 10 2 3 Land use class

**Proportion of each land class in area** 



**Proportion of vegetation cover class in area** 



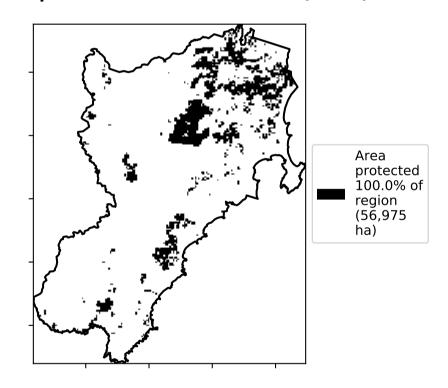


# % Area protected from water erosion (>70%)

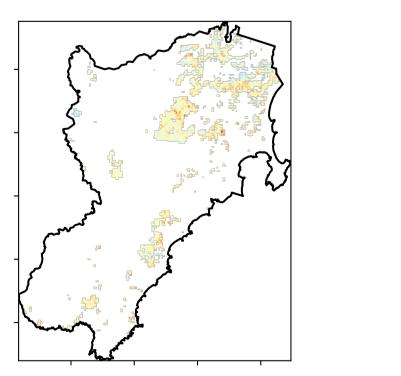
Land use and forest cover

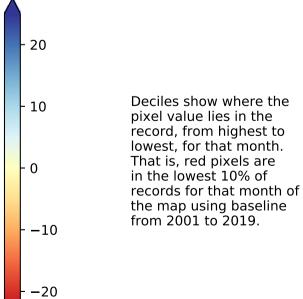
Area not protected 0.2% of region (113 ha) Area protected 99.8% of region (56,861 ha)

% Area protected from wind erosion (>50%)

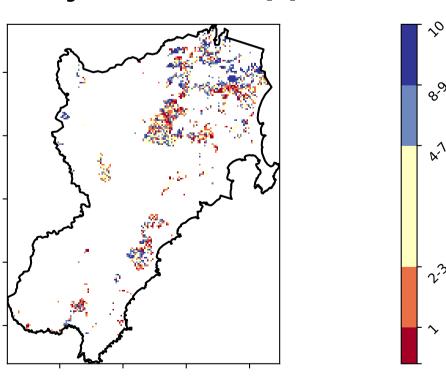


# **Total Vegetation Cover Anomaly [%]**





**Total Vegetation Cover Decile [%]** 





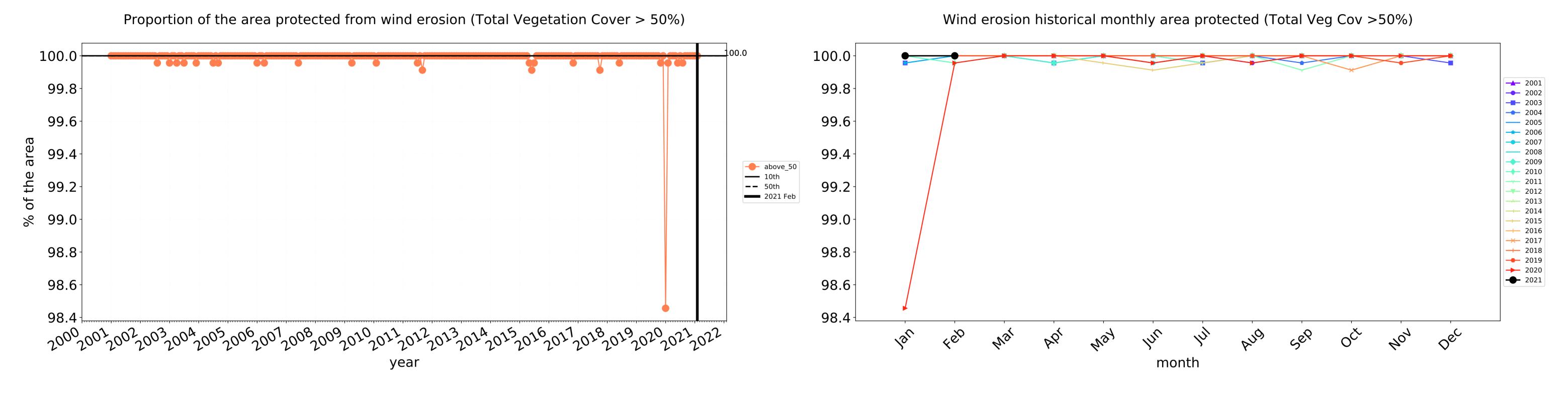


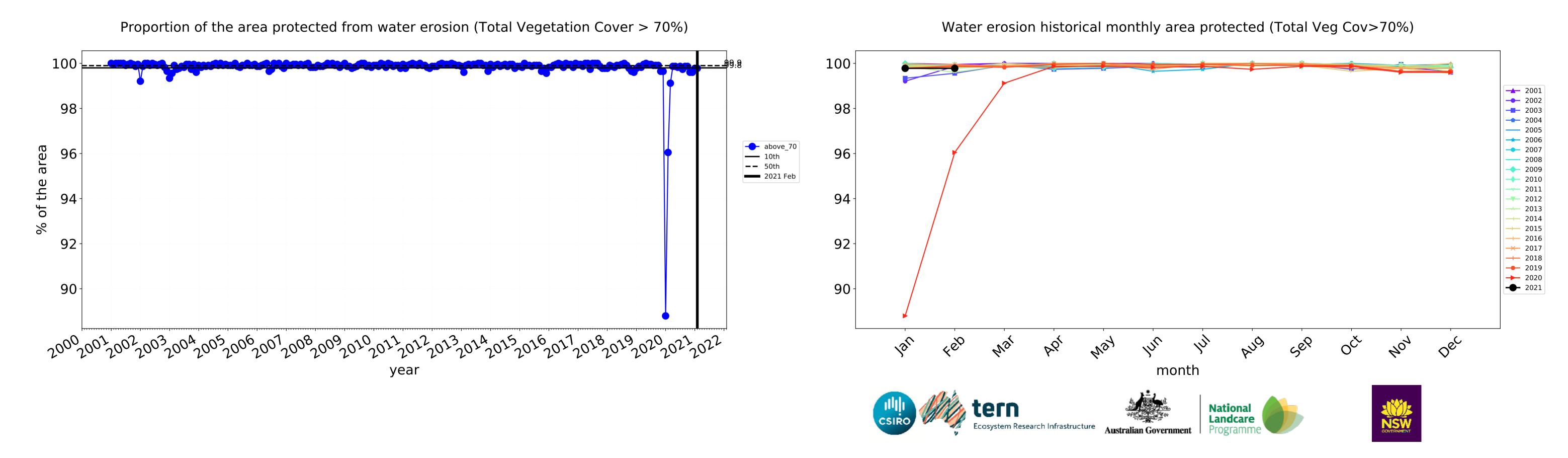


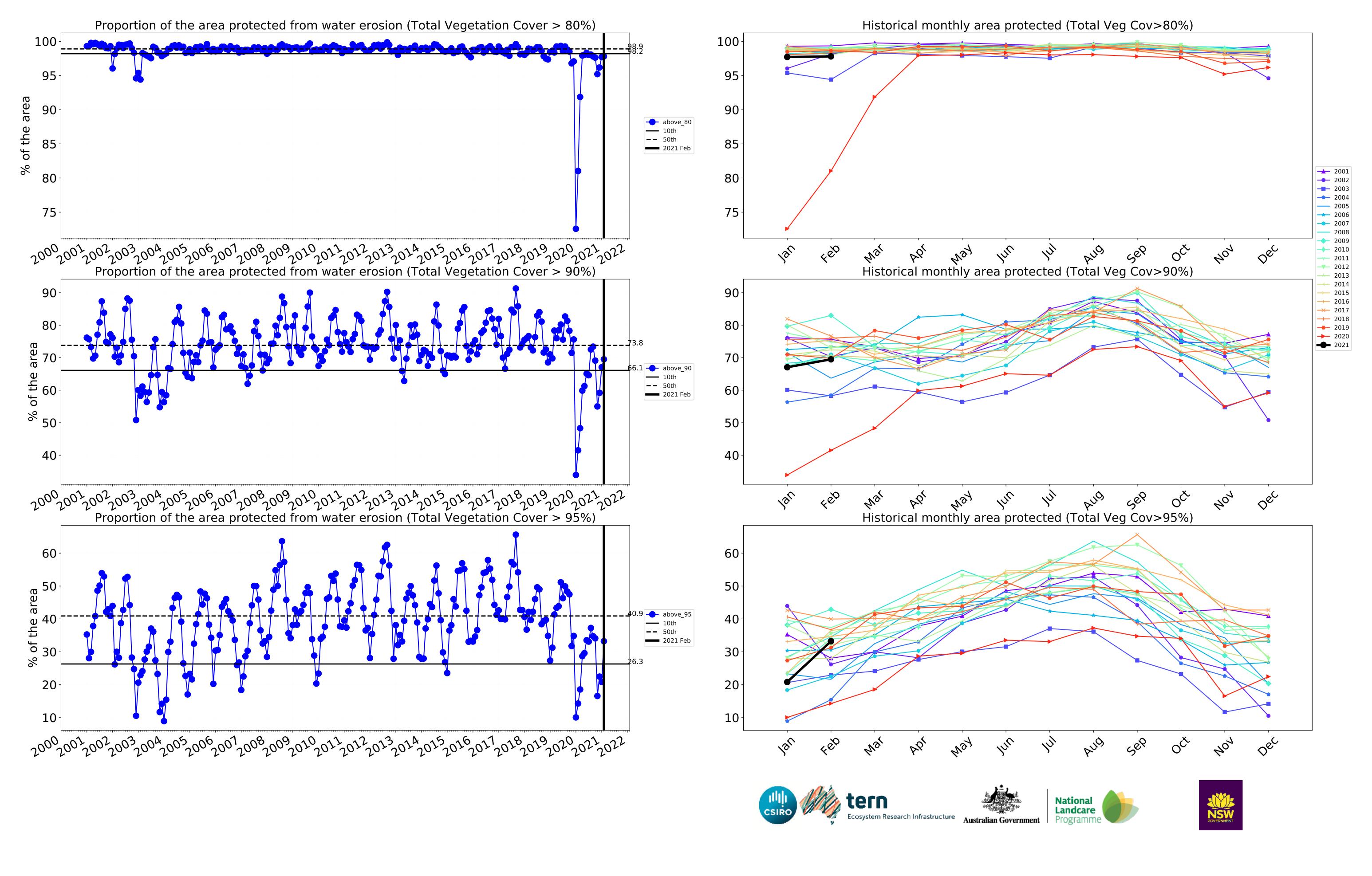




# **Grazing timeseries**







# **Grazing non forest**

# Land use and forest cover

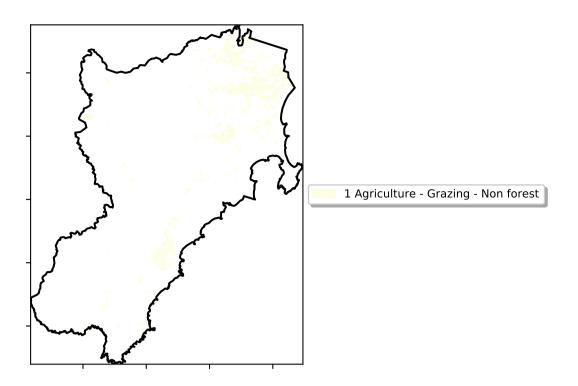
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Anomaly show how many percetage points each

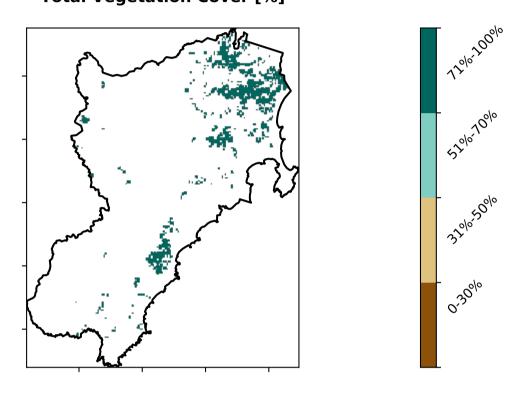
pixel is from the mean. That

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

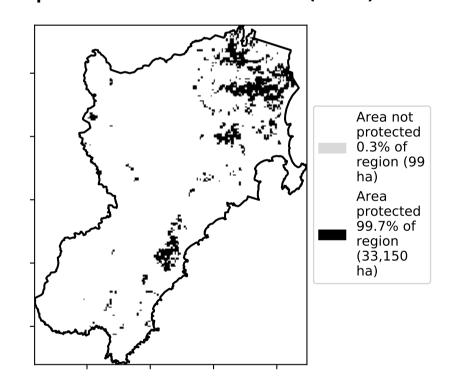
pixel. The mean is only for the month of the map using baseline from 2001 to 2019.



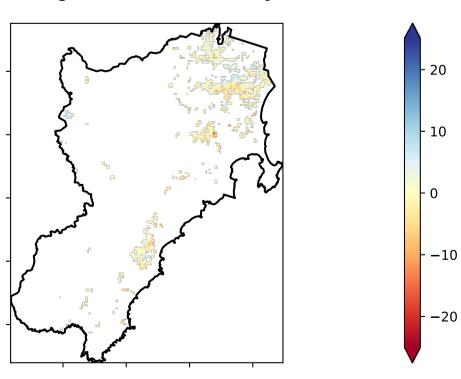
# **Total Vegetation Cover [%]**



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

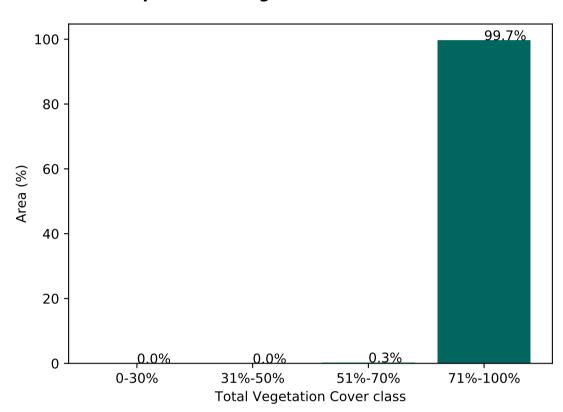


# **Total Vegetation Cover Anomaly [%]**

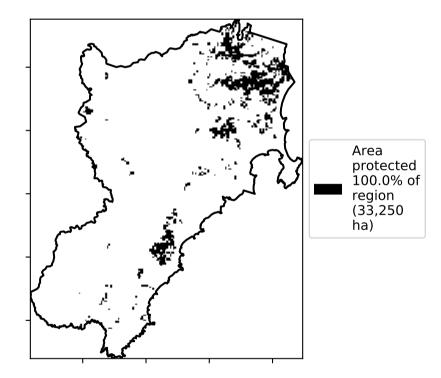


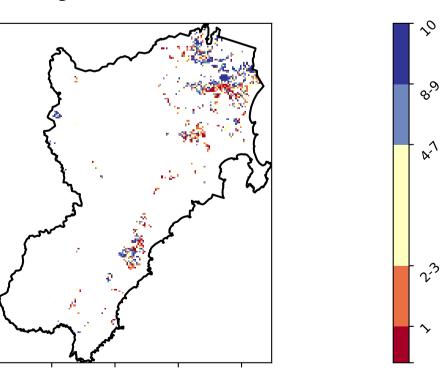
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





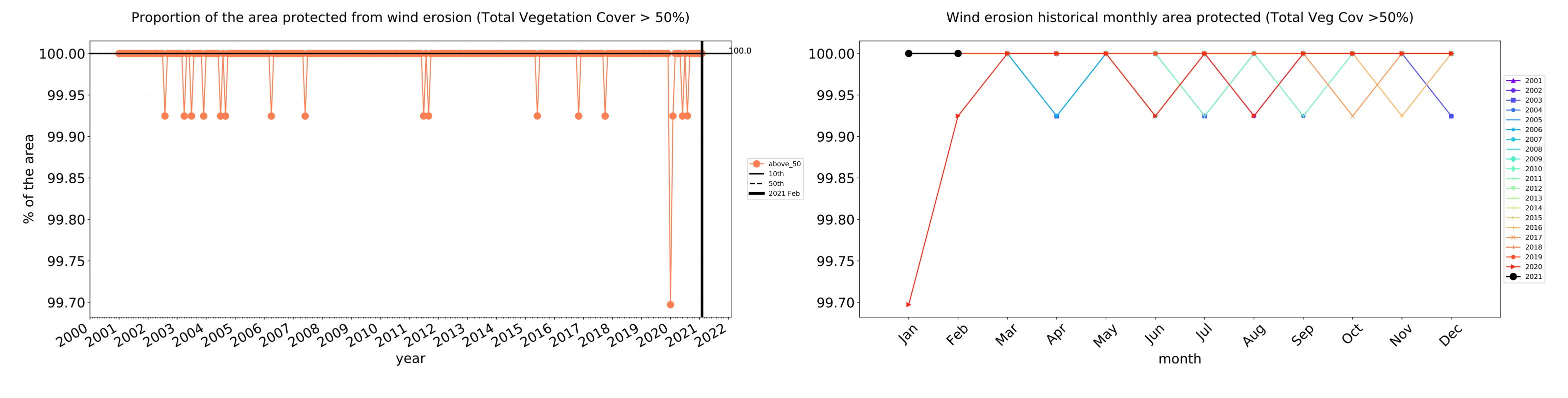


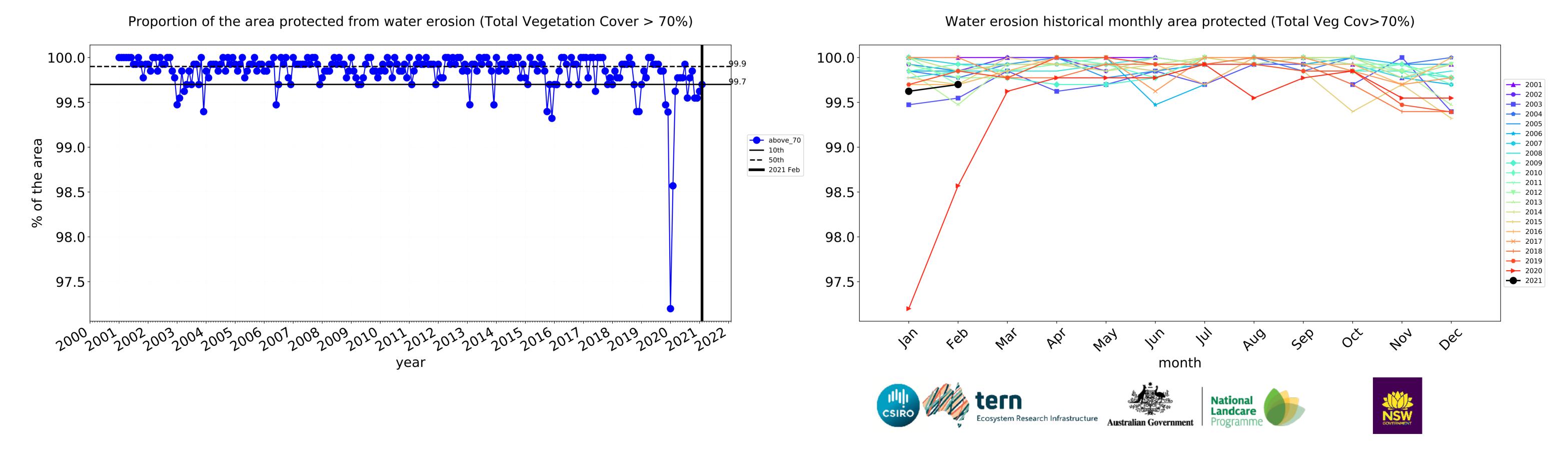


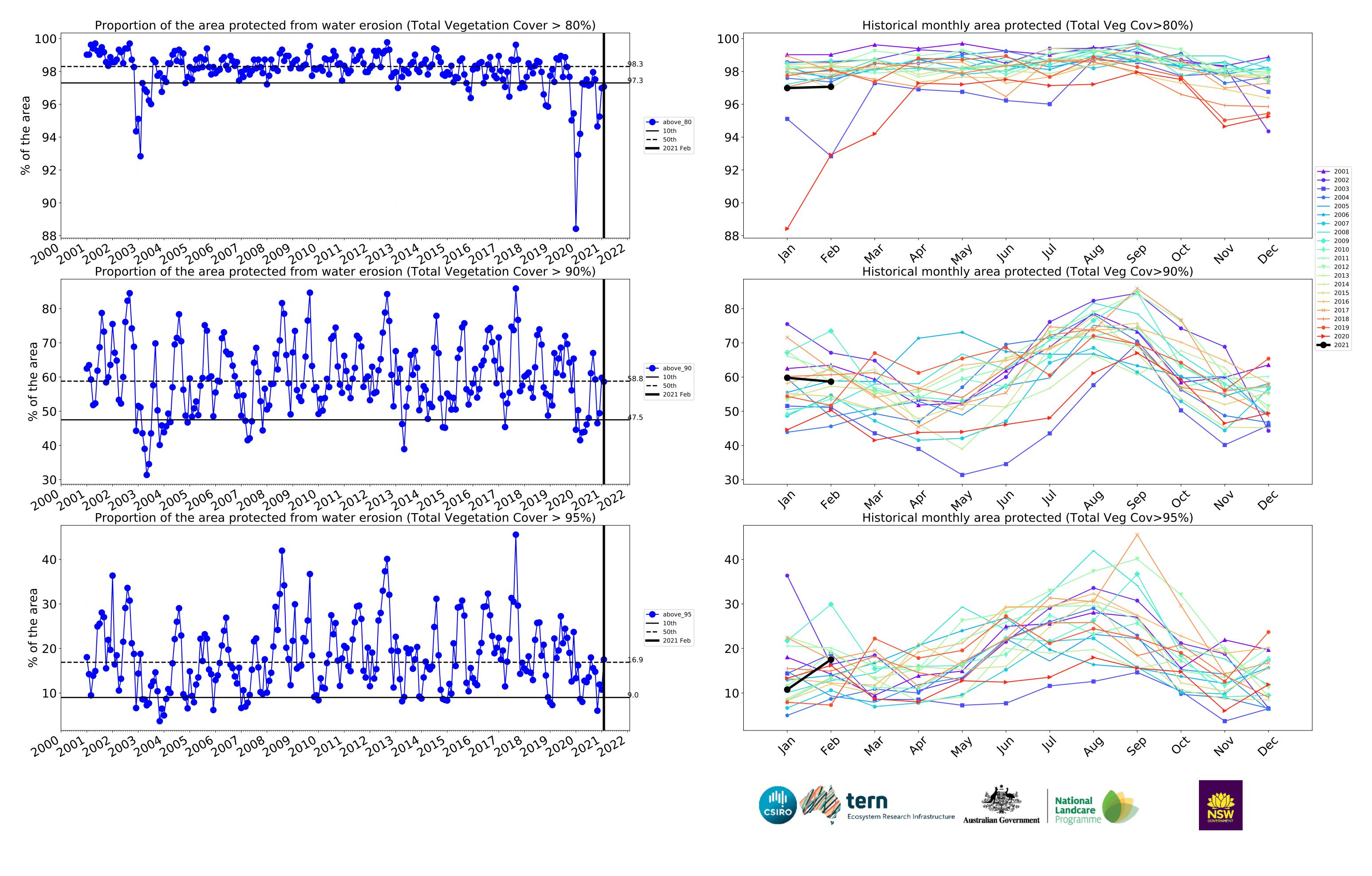




# **Grazing non forest timeseries**







# **Grazing Woodland forest**

# Land use and forest cover

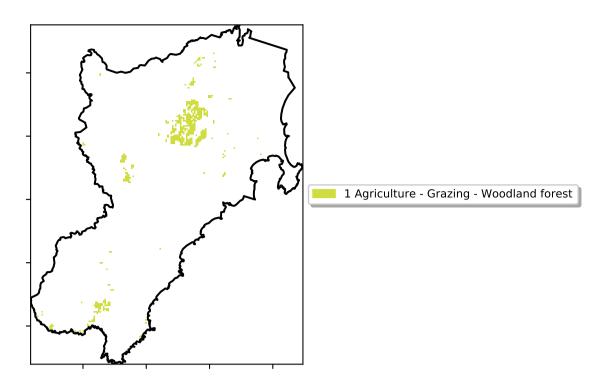
Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

Anomaly show how many percetage points each

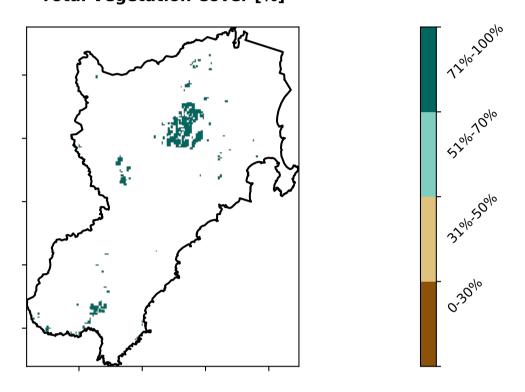
pixel is from the mean. That

pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

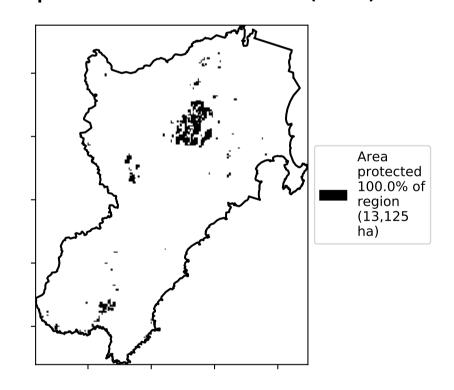
is, red pixels are about 20% lower than the mean of that



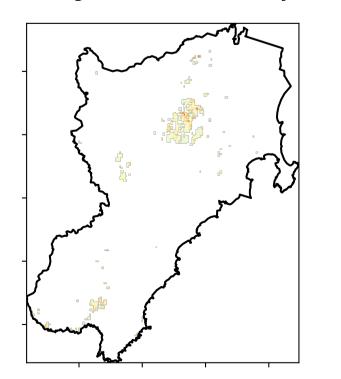
# **Total Vegetation Cover [%]**

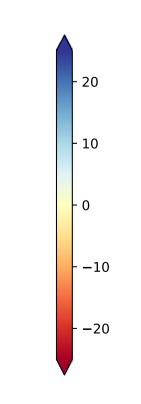


# % Area protected from water erosion (>70%)



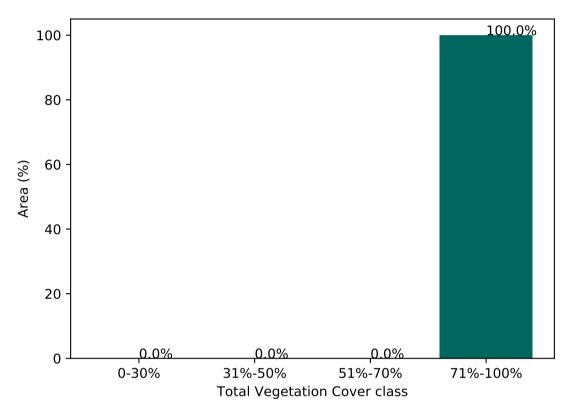
**Total Vegetation Cover Anomaly [%]** 



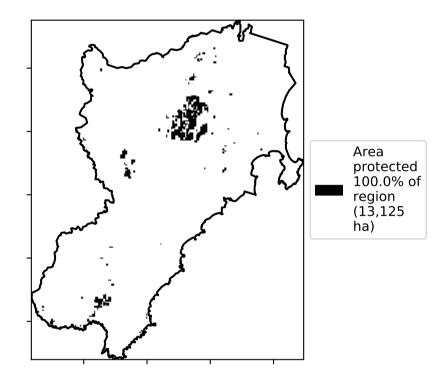


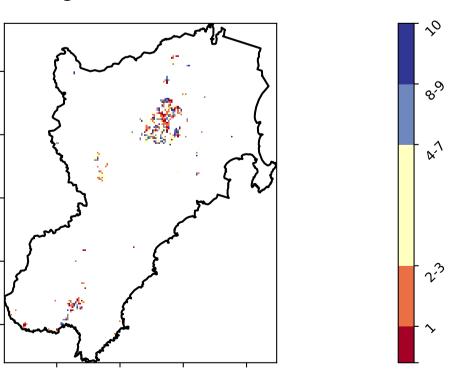
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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









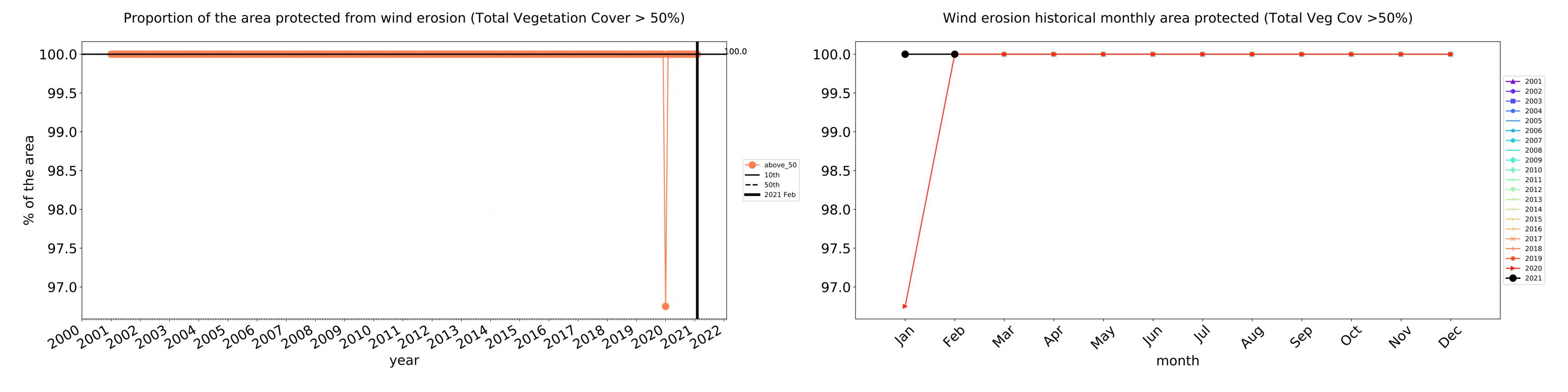


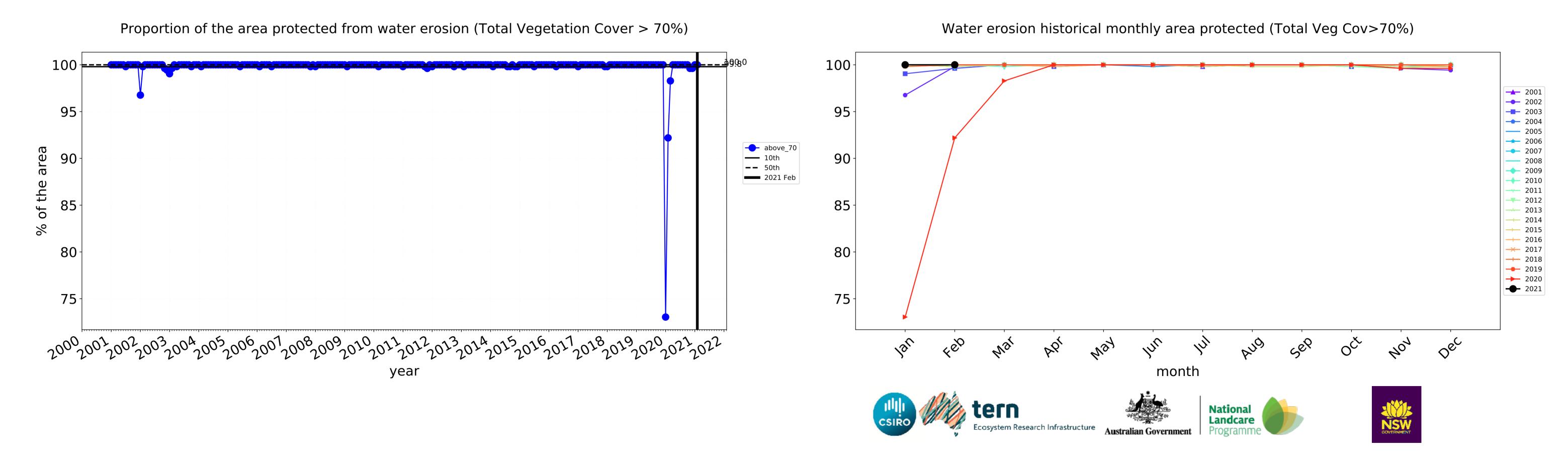


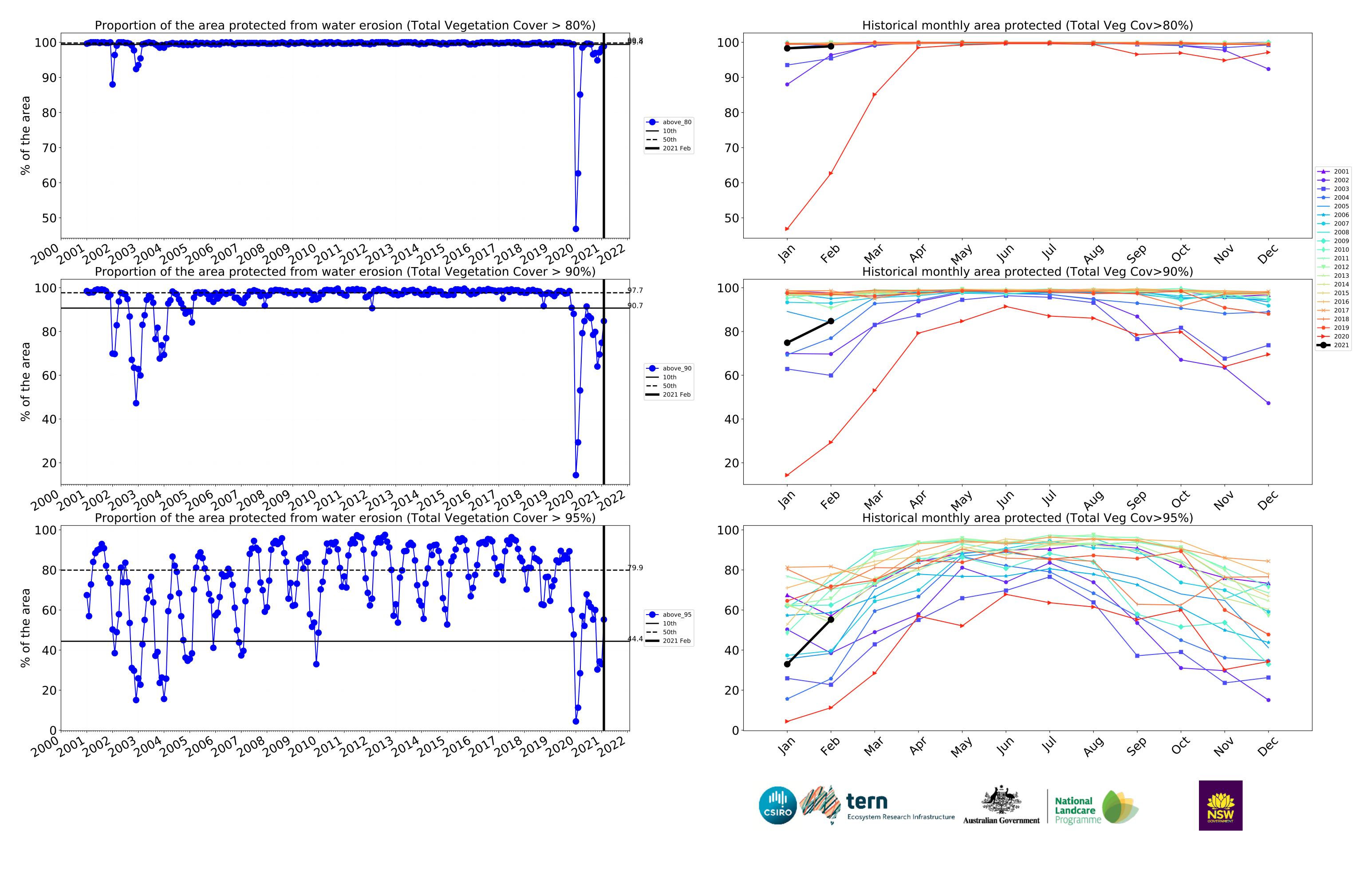




# **Grazing Woodland forest timeseries**







# **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)

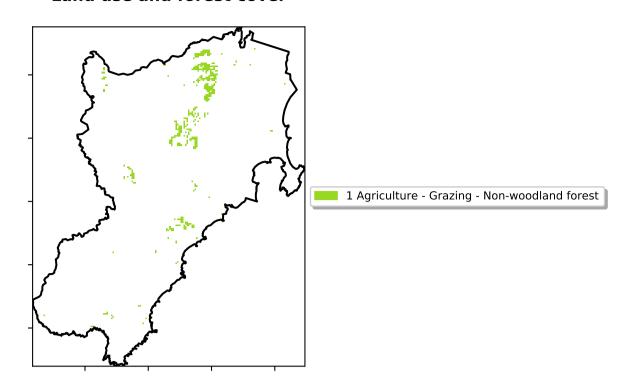
Anomaly show how many percetage points each

pixel is from

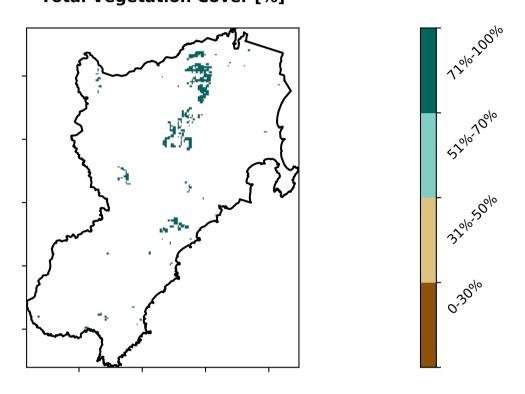
is, red pixels are about 20% lower than the mean of that

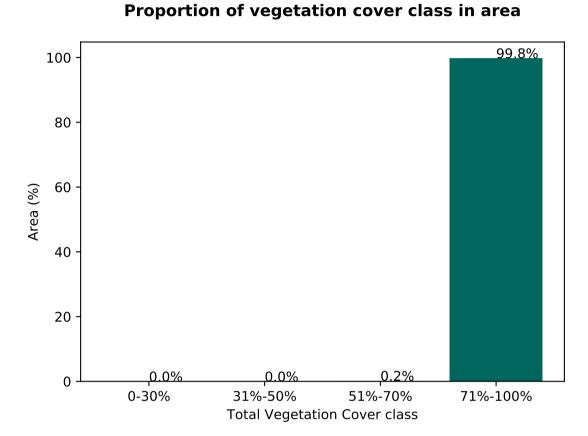
the mean. That

pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

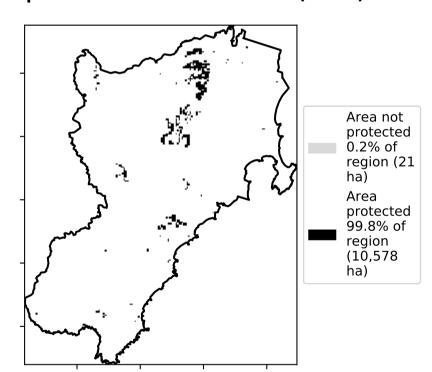


# **Total Vegetation Cover [%]**

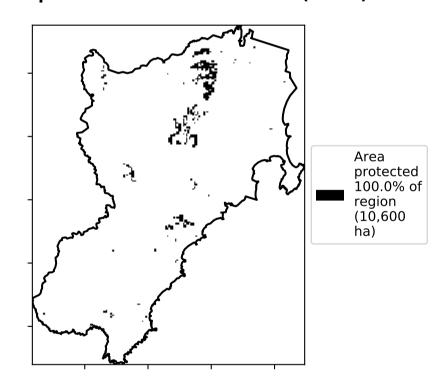




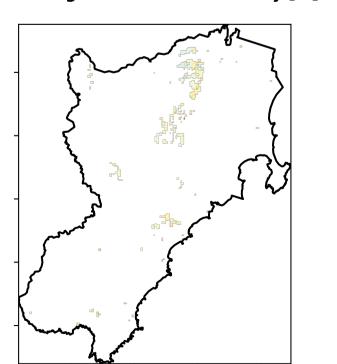
# % Area protected from water erosion (>70%)

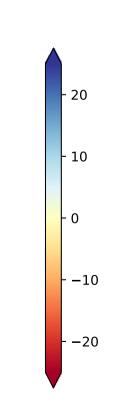


% Area protected from wind erosion (>50%)



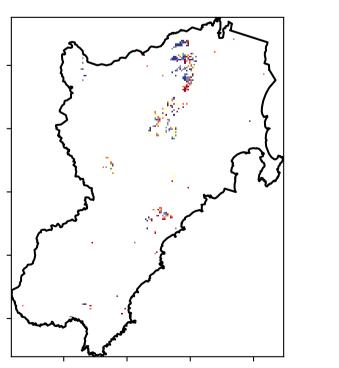
# **Total Vegetation Cover Anomaly [%]**

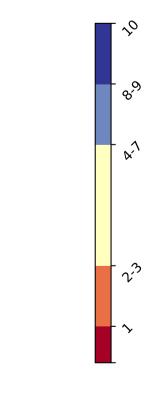




Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

Total Vegetation Cover Decile [%]







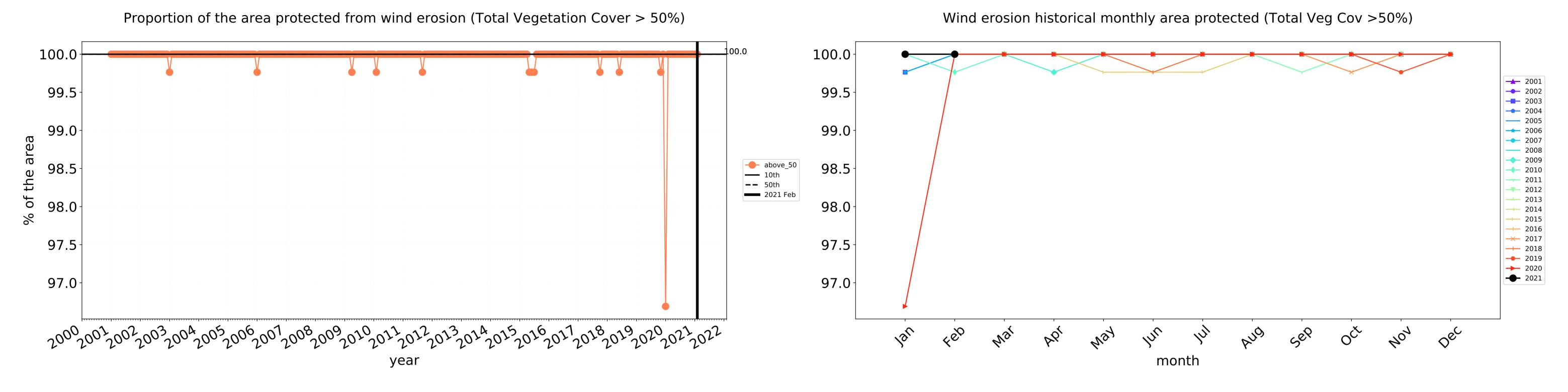


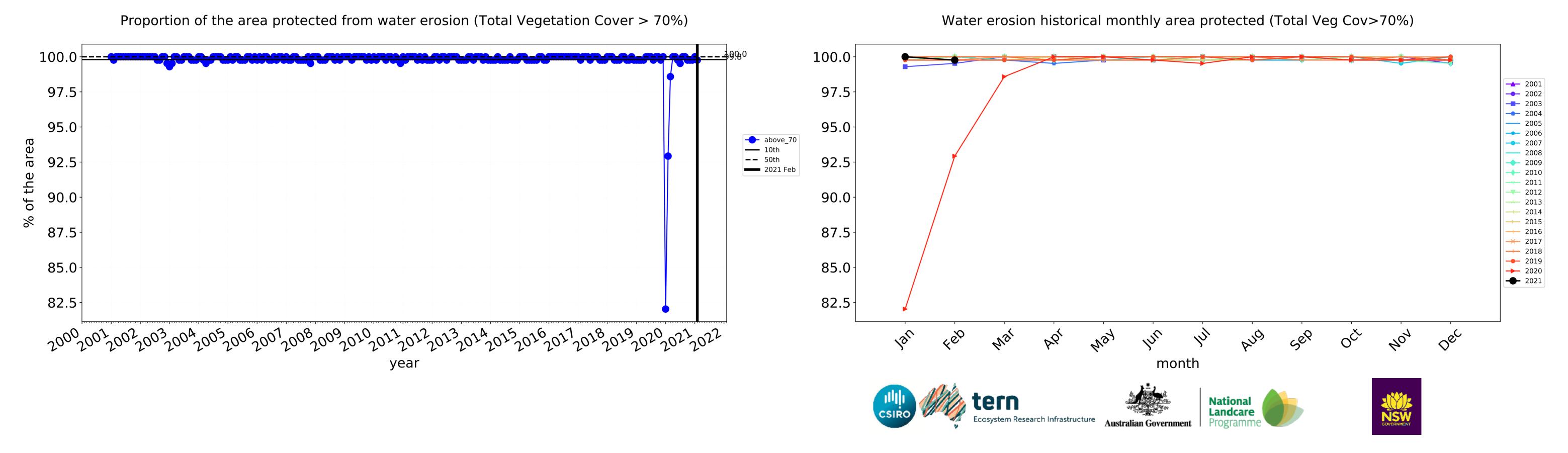


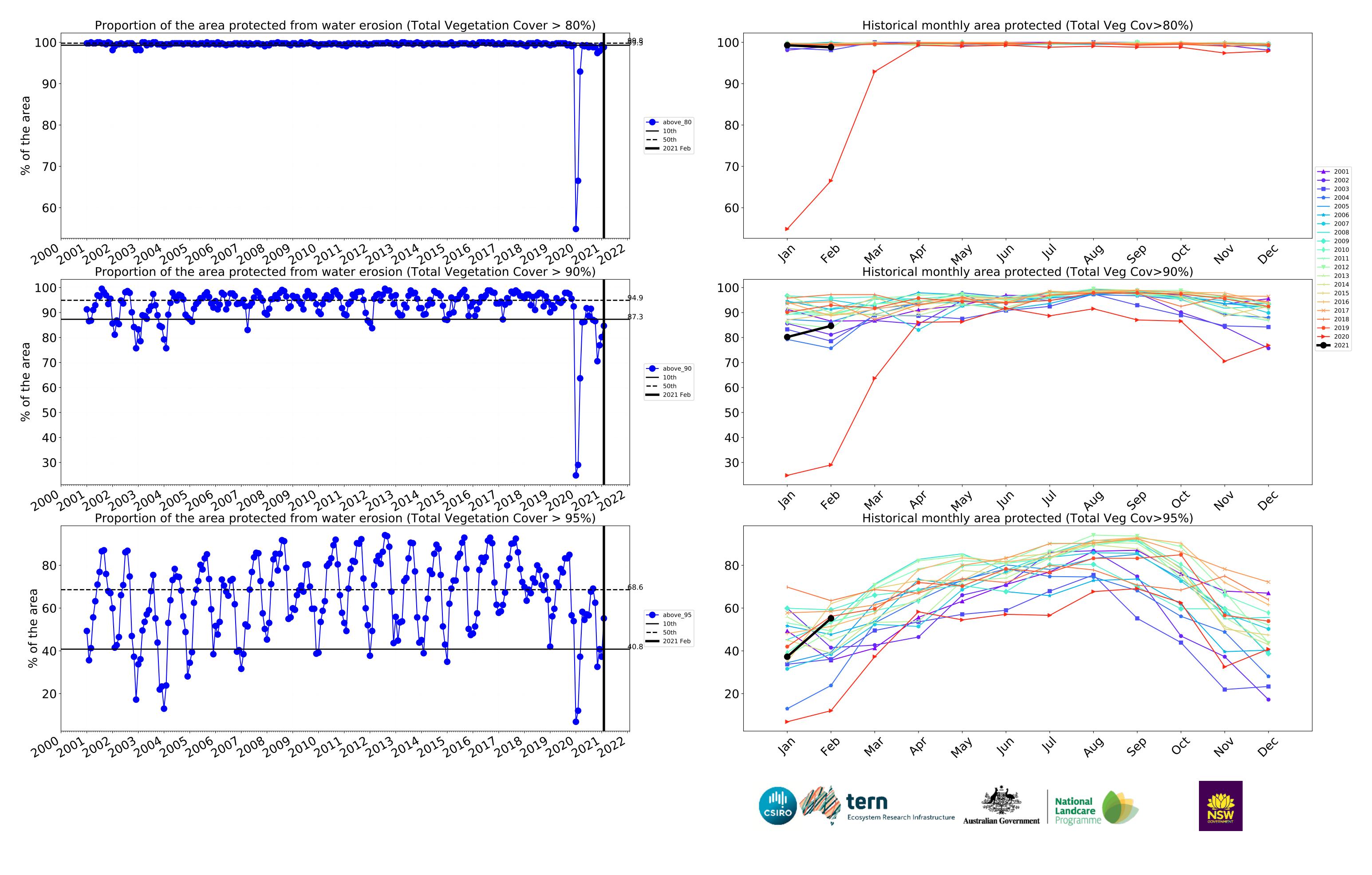






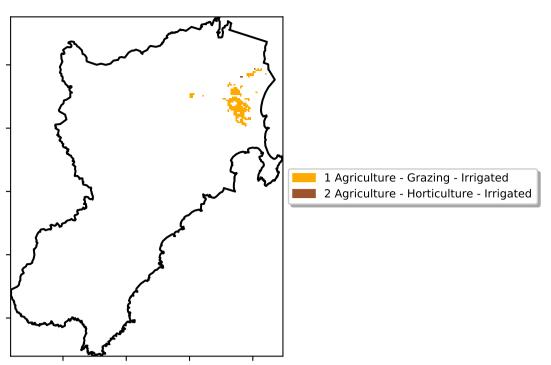




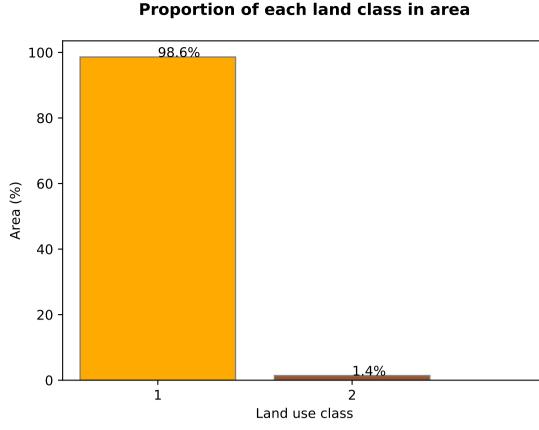


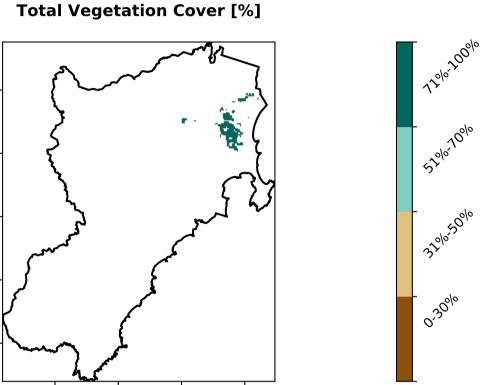
# Irrigation

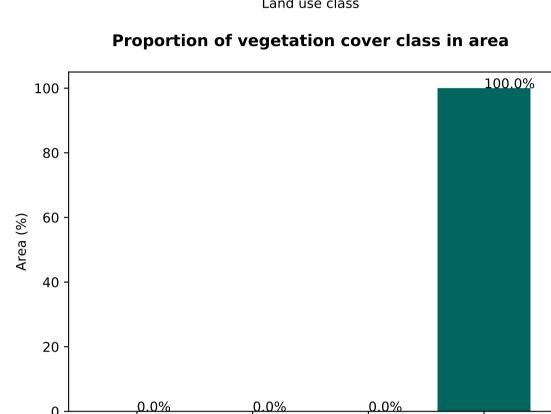
# Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)



Land use and forest cover

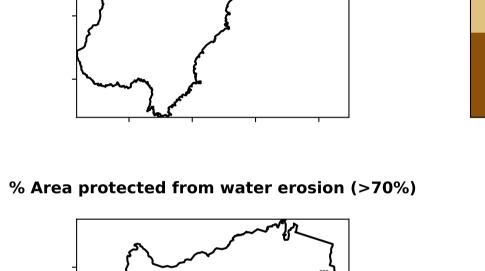






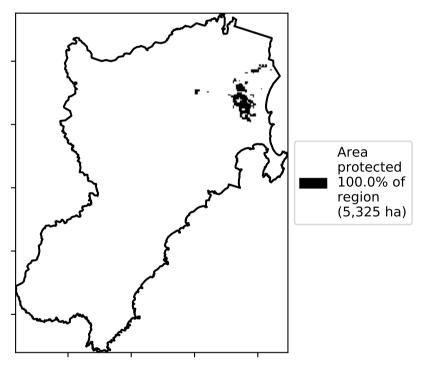
31%-50%

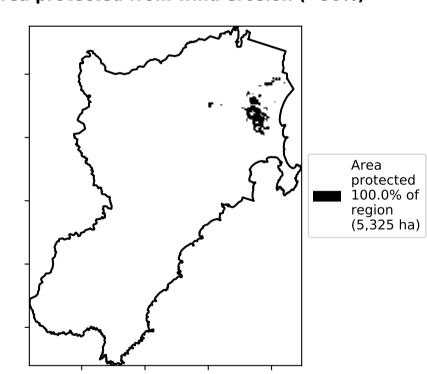
0-30%





**Total Vegetation Cover class** 



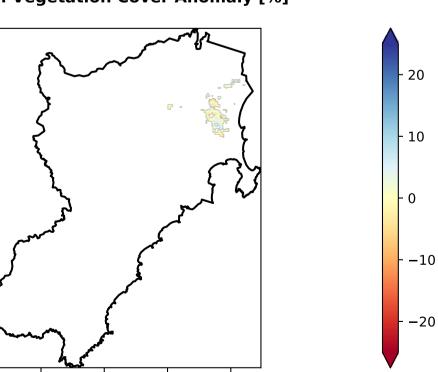


51%-70%

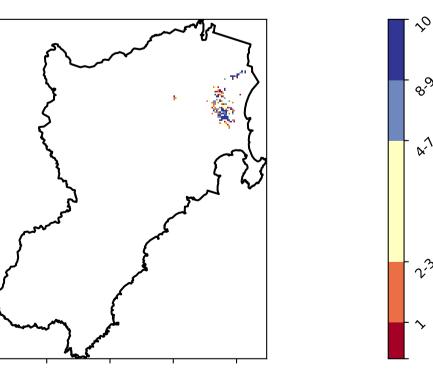
71%-100%

**Total Vegetation Cover Anomaly [%]** 

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



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



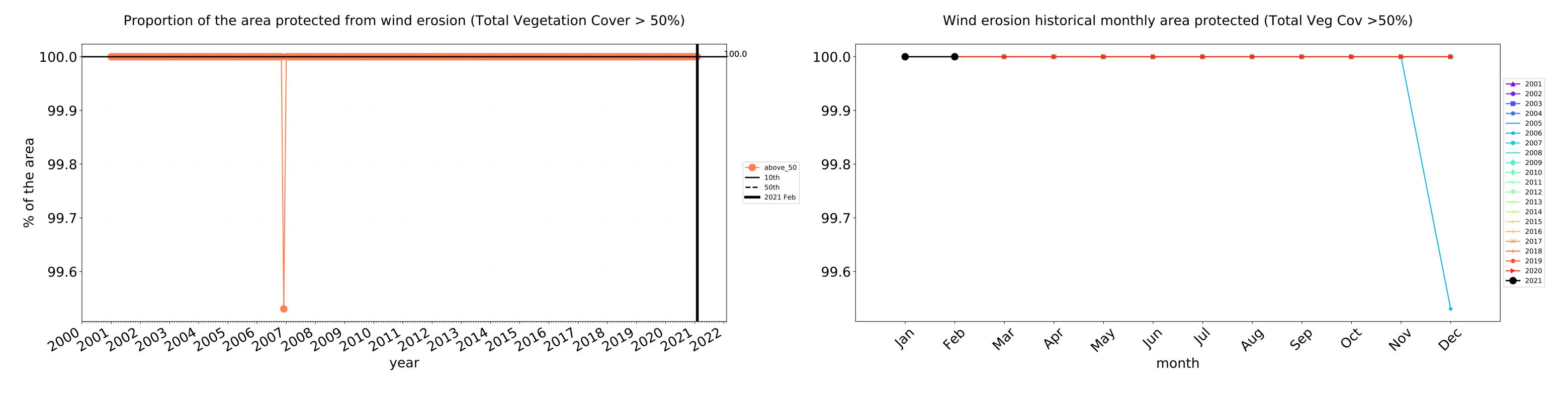


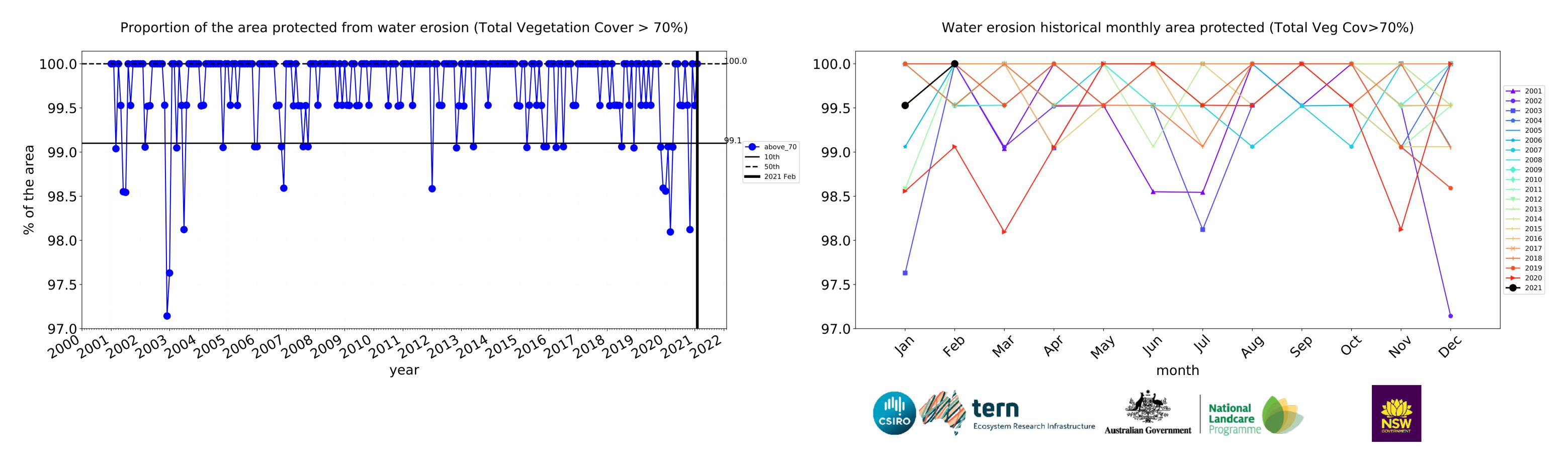


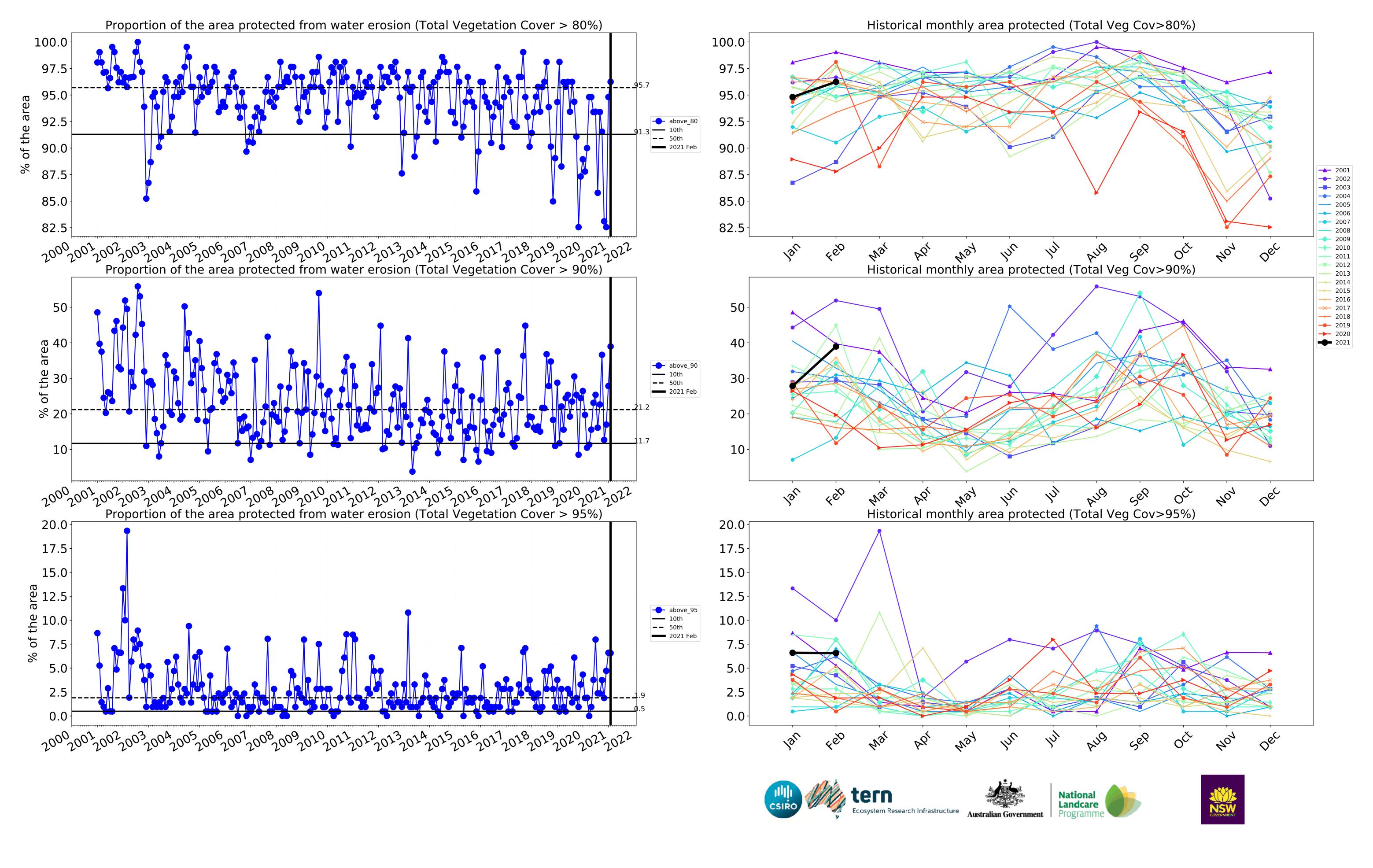




# Irrigation timeseries







# **Production native forests and plantation forests**

# 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

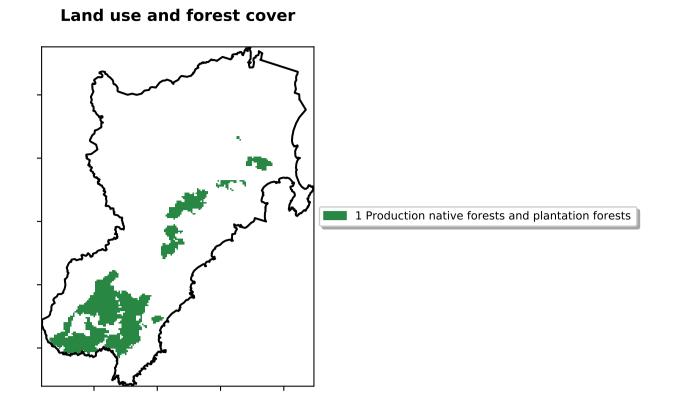
pixel is from

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

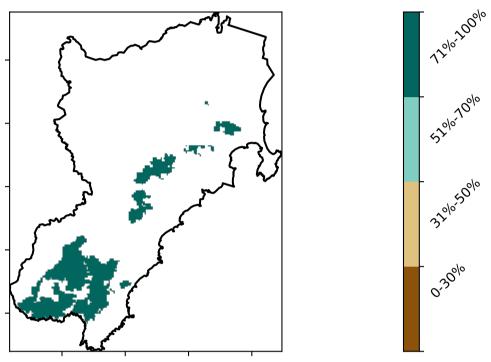
the mean. That

is only for the month of the map

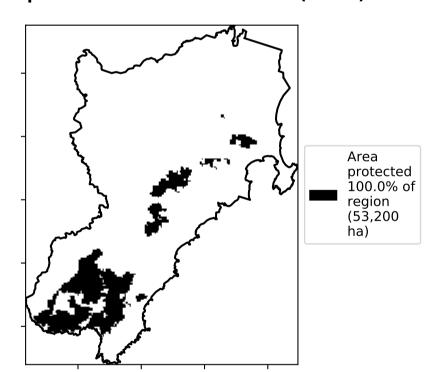
using baseline from 2001 to 2019.



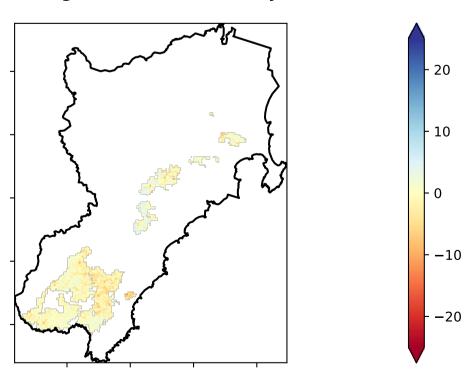
# Total Vegetation Cover [%]



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

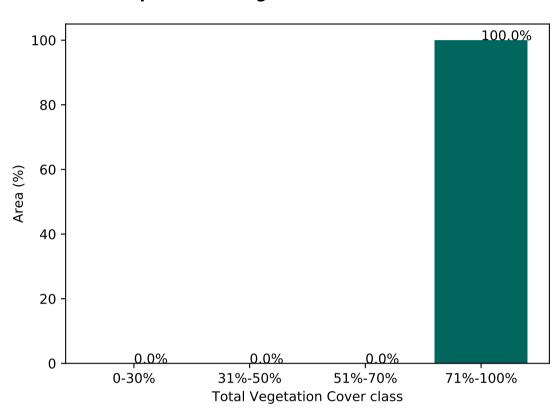


# **Total Vegetation Cover Anomaly [%]**

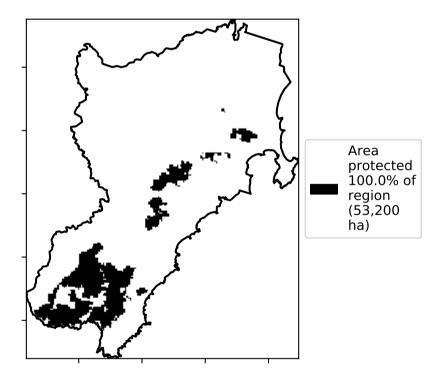


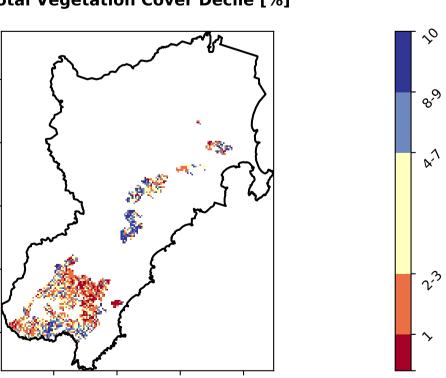
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

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



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





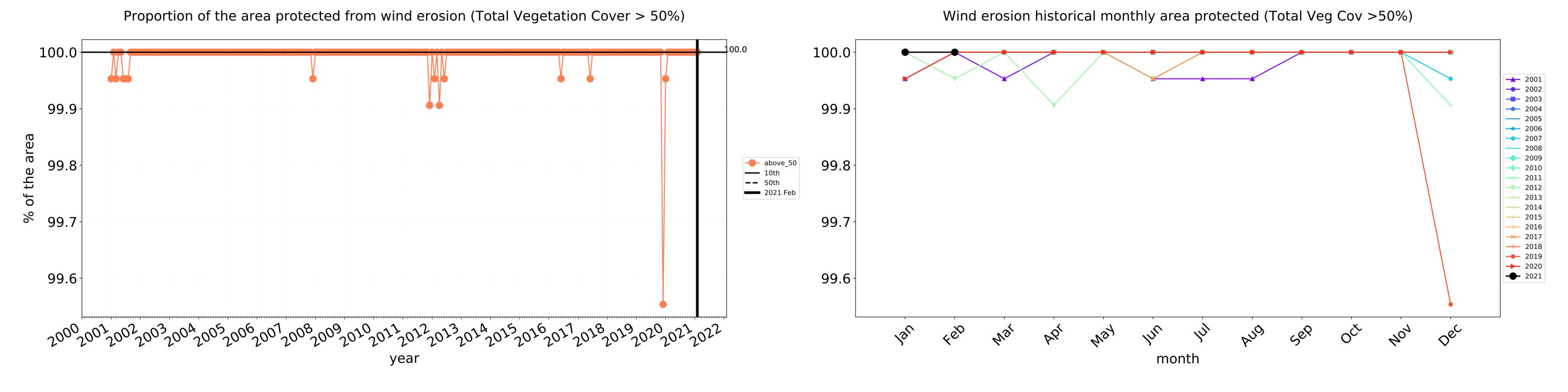


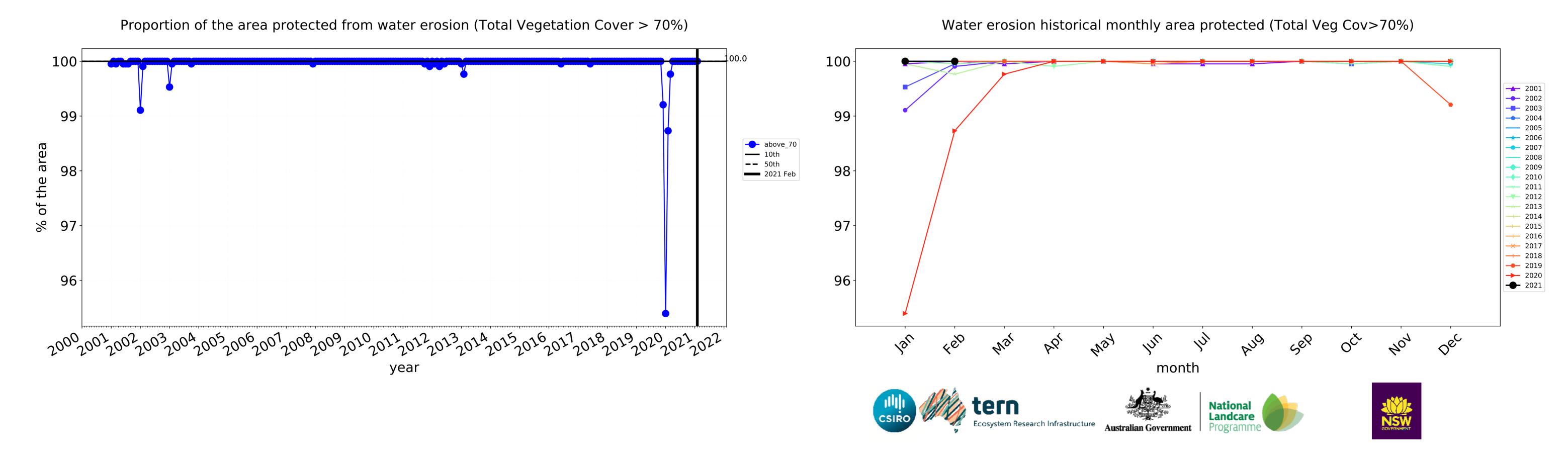


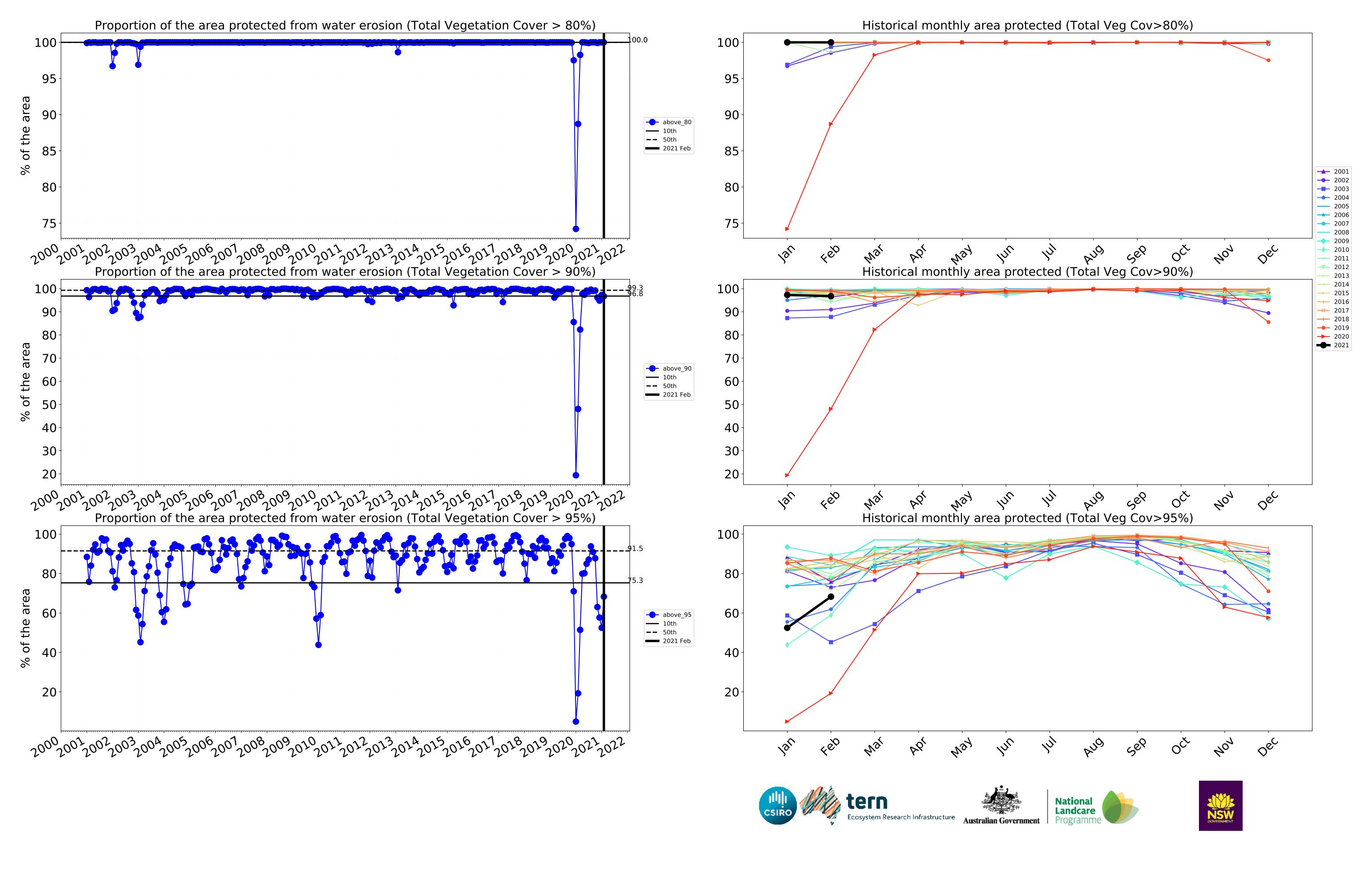




# **Production native forests and plantation forests timeseries**







# Shoalhaven\_(C) (447,075 ha and no data 9,722 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	447,075	100.0% 446,875	99.8% 446,375	98.9% 442,300	95.6% 427,600	76.5% 341,925	47.2% 210,825
Conservation and natural environments	298,425	100.0% 298,425	99.9% 298,275	99.6% 297,350	96.8% 289,000	79.1% 236,125	50.5% 150,775
Conservation and natural environments non forest	6,150	100.0% 6,150	98.4% 6,050	95.1% 5,850	89.0% 5,475	64.6% 3,975	31.7% 1,950
Conservation and natural environments Woodland forest	184,325	100.0% 184,325	100.0% 184,300	99.7% 183,850	96.2% 177,375	77.6% 142,975	51.8% 95,550
Conservation and natural environments Forest (non woodland)	107,950	100.0% 107,950	100.0% 107,925	99.7% 107,650	98.3% 106,150	82.6% 89,175	49.4% 53,275
Agriculture	62,425	100.0% 62,425	100.0% 62,425	99.8% 62,300	97.7% 60,975	67.0% 41,800	31.0% 19,375
Grazing	56,975	100.0% 56,975	100.0% 56,975	99.8% 56,850	97.8% 55,725	69.5% 39,600	33.2% 18,925
Grazing non forest	33,250	100.0% 33,250	100.0% 33,250	99.7% 33,150	97.1% 32,275	58.6% 19,500	17.5% 5,825
Grazing Woodland forest	13,125	100.0% 13,125	100.0% 13,125	100.0% 13,125	98.9% 12,975	84.8% 11,125	55.2% 7,250
Grazing - Forest (non woodland)	10,600	100.0% 10,600	100.0% 10,600	99.8% 10,575	98.8% 10,475	84.7% 8,975	55.2% 5,850
Irrigation	5,325	100.0% 5,325	100.0% 5,325	100.0% 5,325	96.2% 5,125	39.0% 2,075	6.6% 350
Production native forests and plantation forests	53,200	100.0% 53,200	100.0% 53,200	100.0% 53,200	100.0% 53,200	96.8% 51,475	68.3% 36,325







