# Total vegetation cover soil protection Region:NRM Mackay Whitsunday 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:

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: June 2006

# **Vegetation Cover Jun 2006**

#### Land use and forest cover

# Legend with land class forest cover and number, i.e. Forests is 12 1 Conservation and natural environments -2 Conservation and natural environments -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 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)

Anomaly show how many percetage points each pixel is from

the mean. That

lower than the

pixel. The mean

month of the map

mean of that

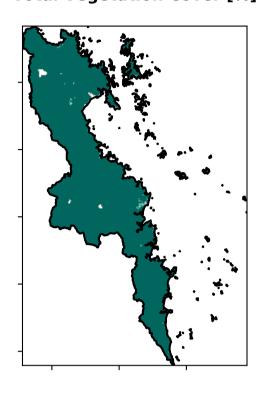
is only for the

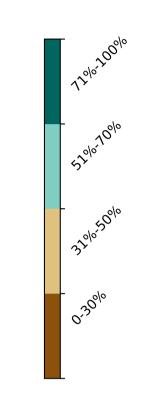
using baseline from 2001 to

2019.

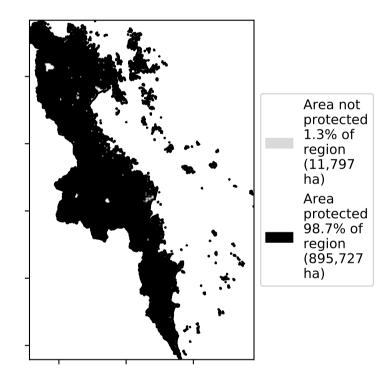
is, red pixels are about 20%

# **Total Vegetation Cover [%]**

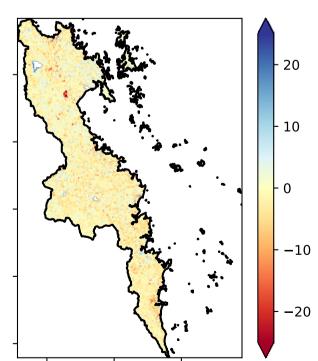




# % Area protected from water erosion (>70%)

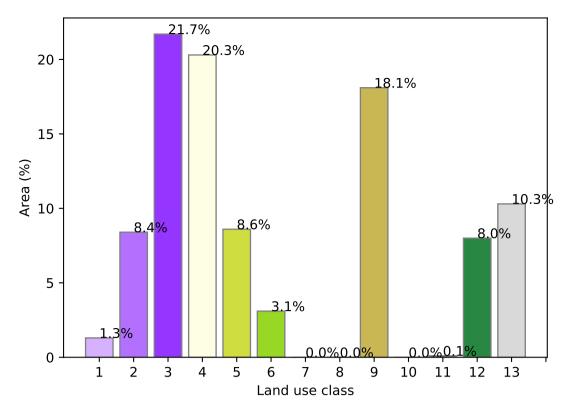


# Total Vegetation Cover Anomaly [%]

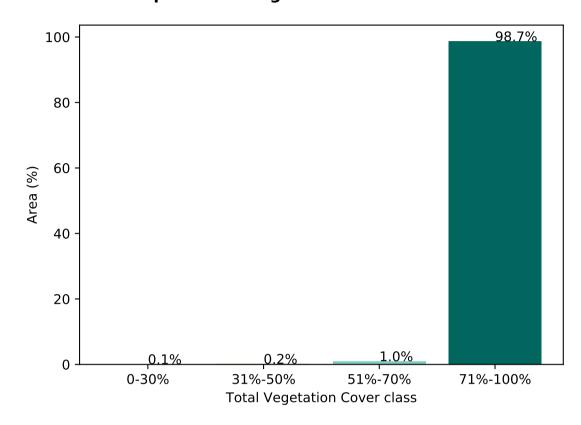


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

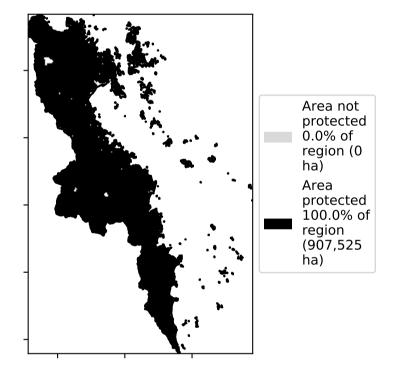
# Proportion of each land class in area

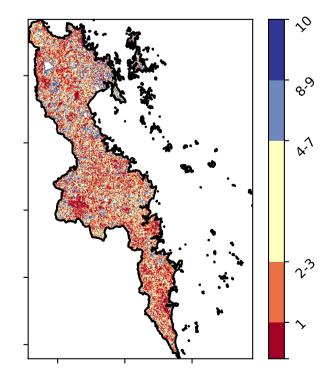


#### Proportion of vegetation cover class in area



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







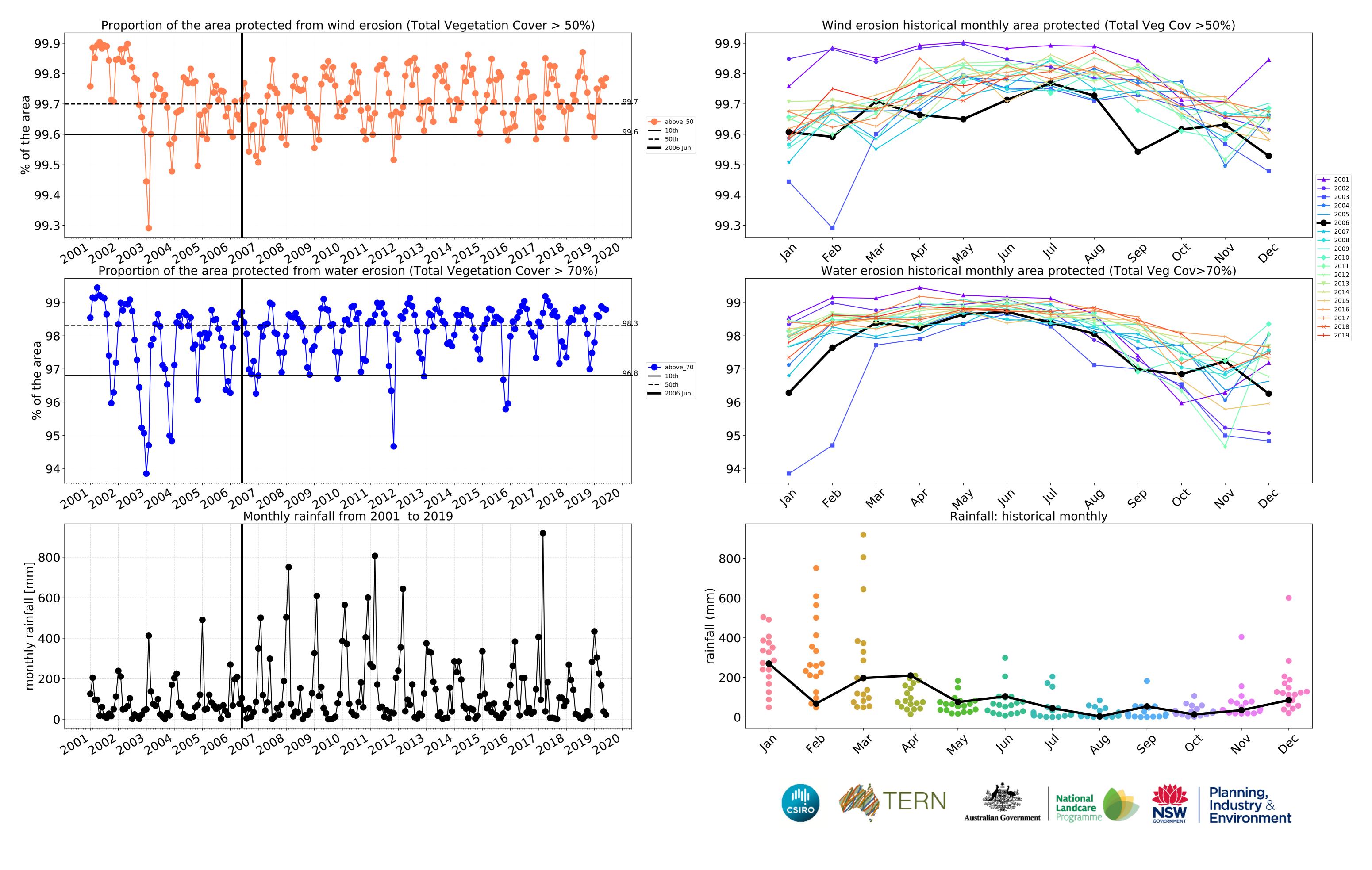


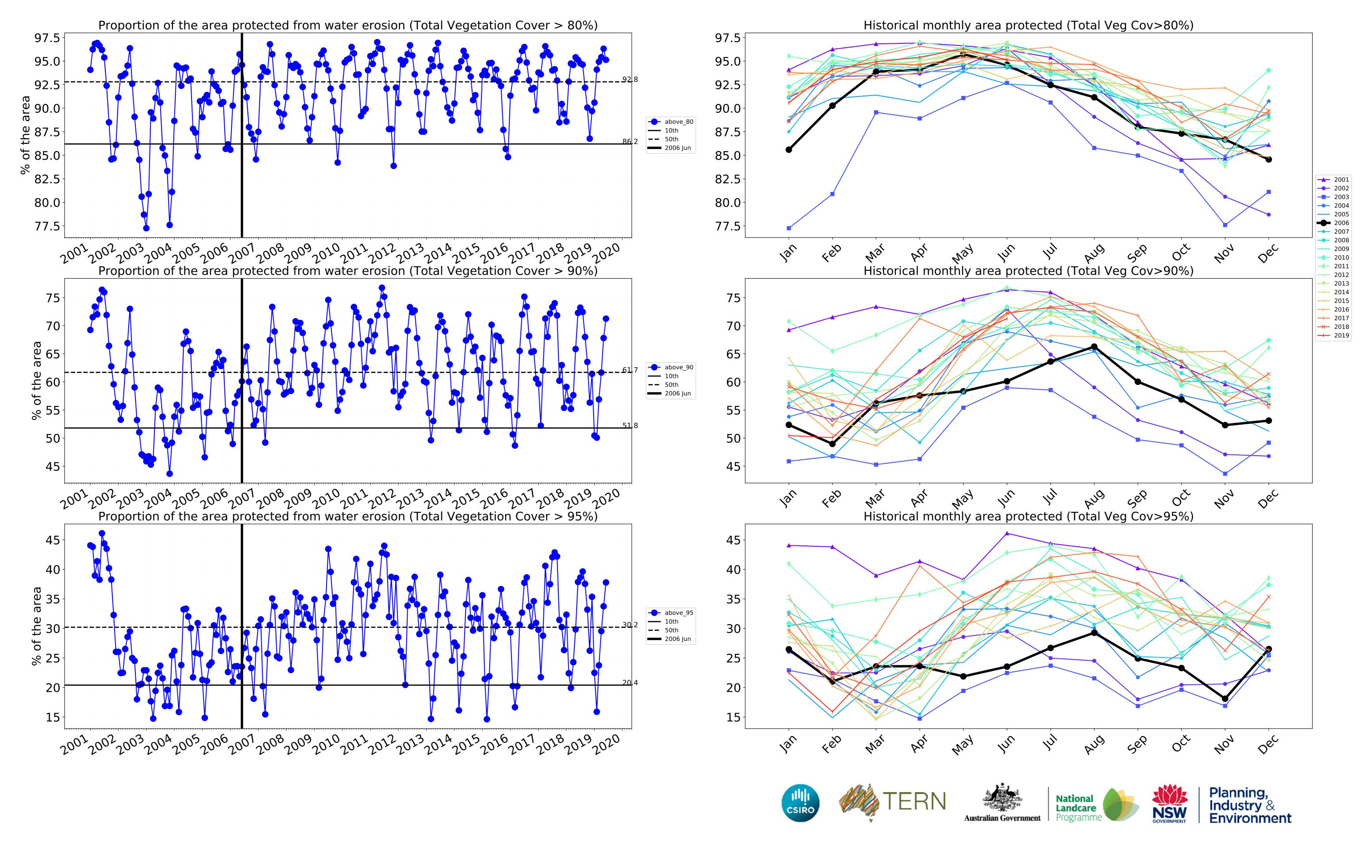












# **Conservation and natural environments**

#### **Land use and forest cover**

Catchment Scale Land Use and Forests

of Australia (2018)

(2018) and Forests

of Australia (2018)

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

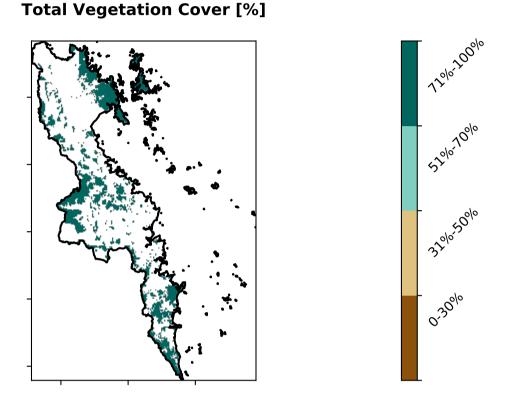
is, red pixels are about 20% lower than the mean of that

Catchment Scale Land

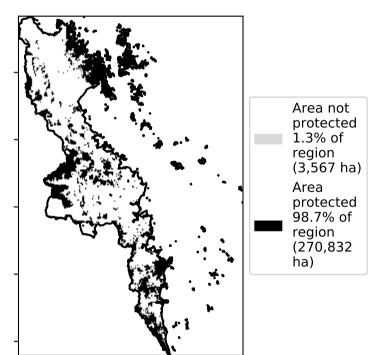
Derived from

Use of Australia

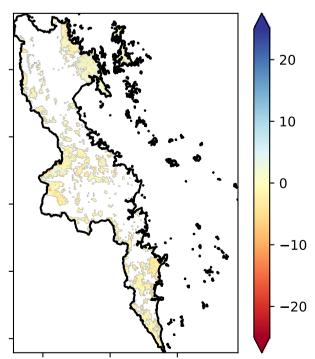
# 1 Conservation and natural environments - Non-2 Conservation and natural environments - Woodland 3 Conservation and natural environments - Non-woodland forest



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

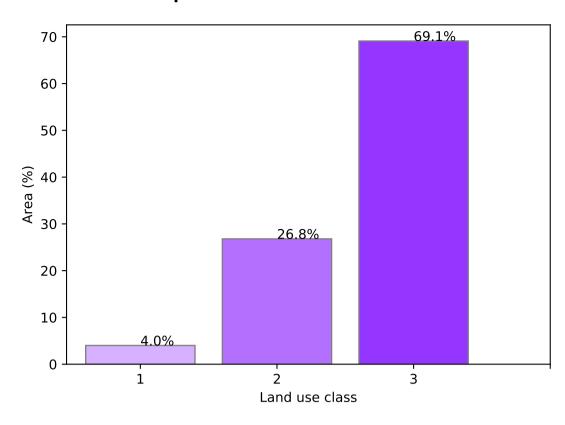


# **Total Vegetation Cover Anomaly [%]**

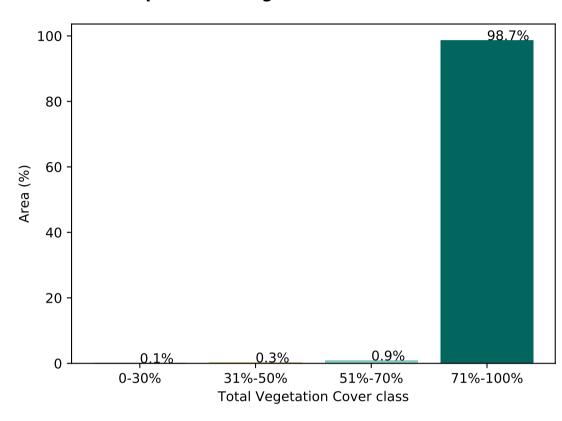


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

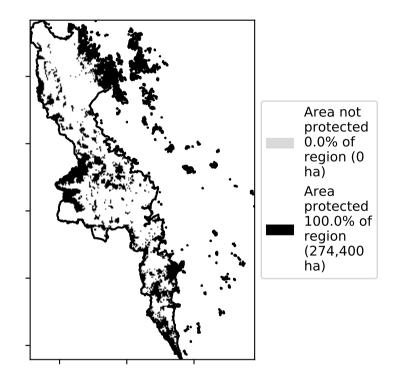
#### Proportion of each land class in area

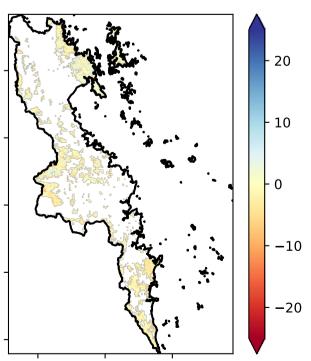


# Proportion of vegetation cover class in area

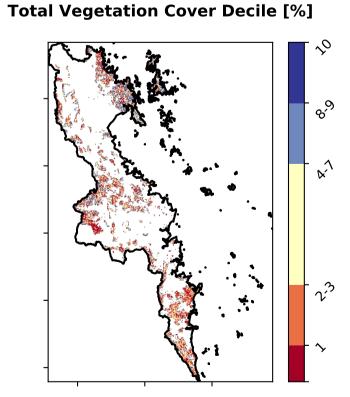


# % Area protected from wind erosion (>50%)





records for that month of







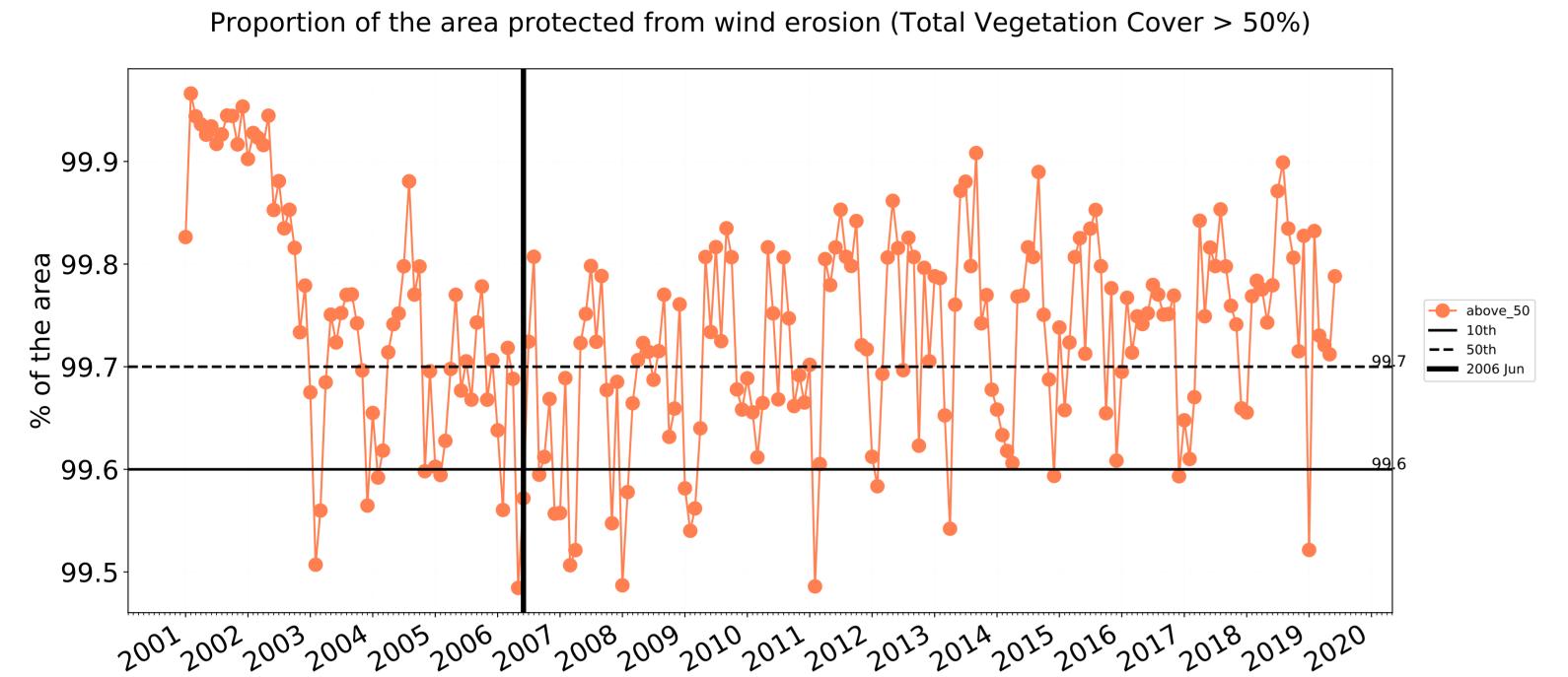


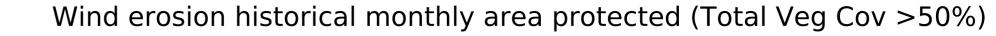


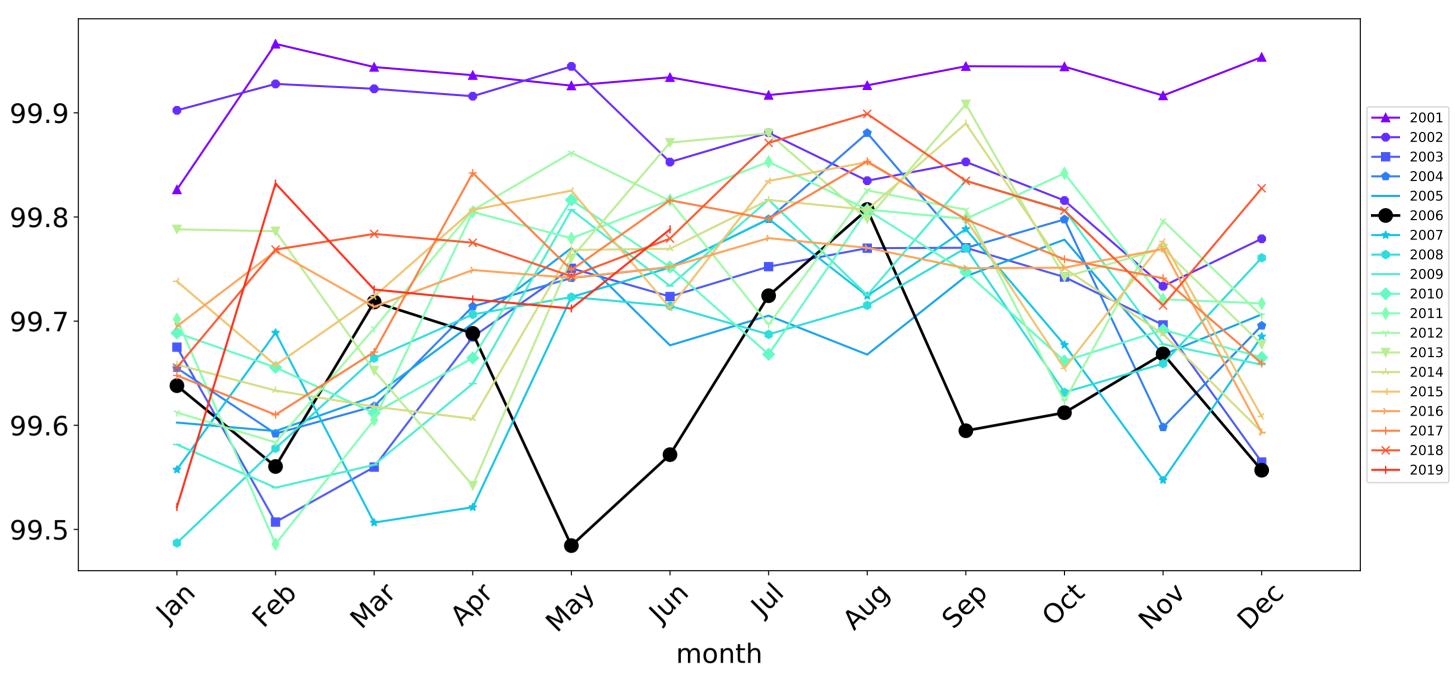


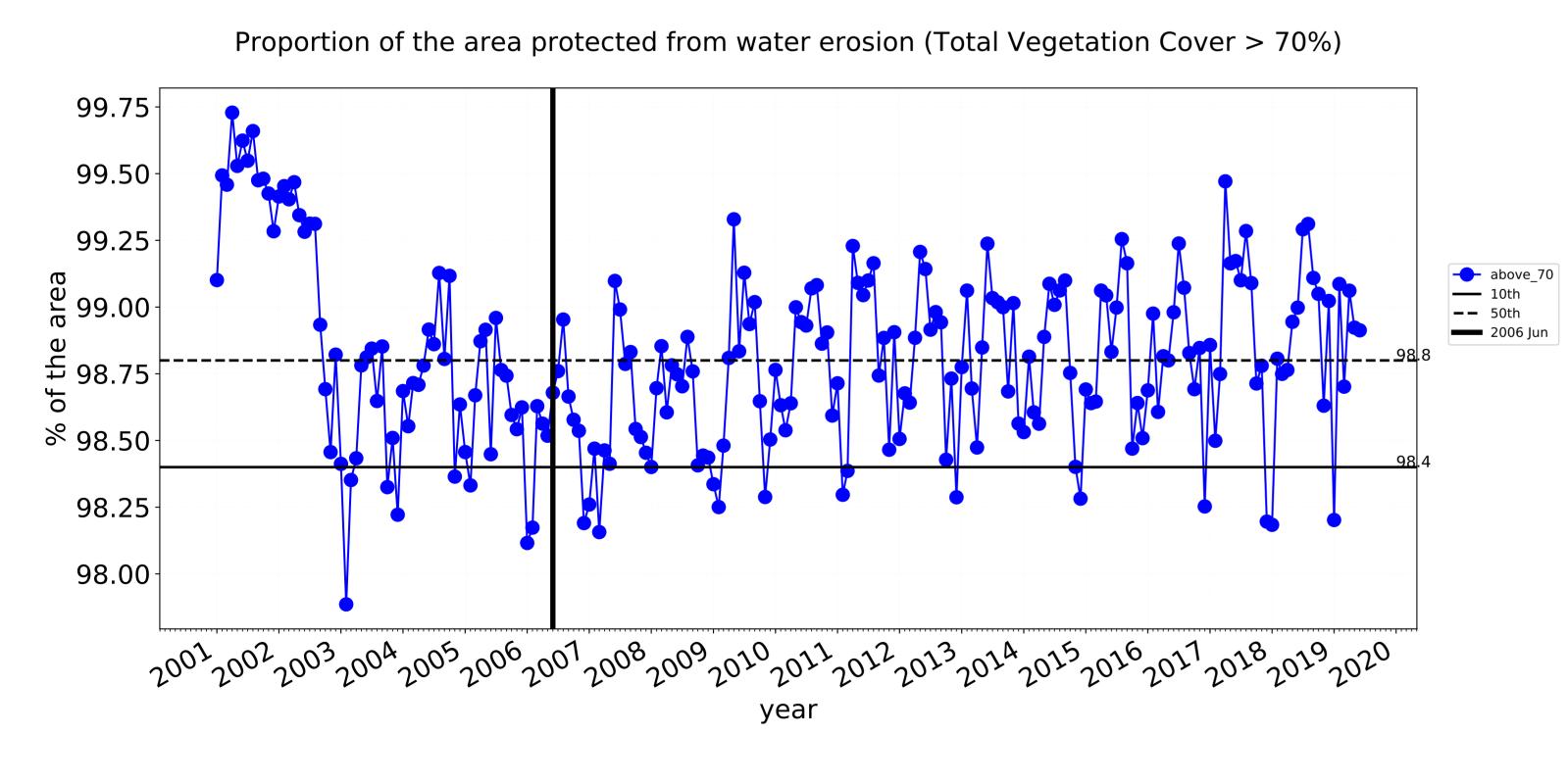


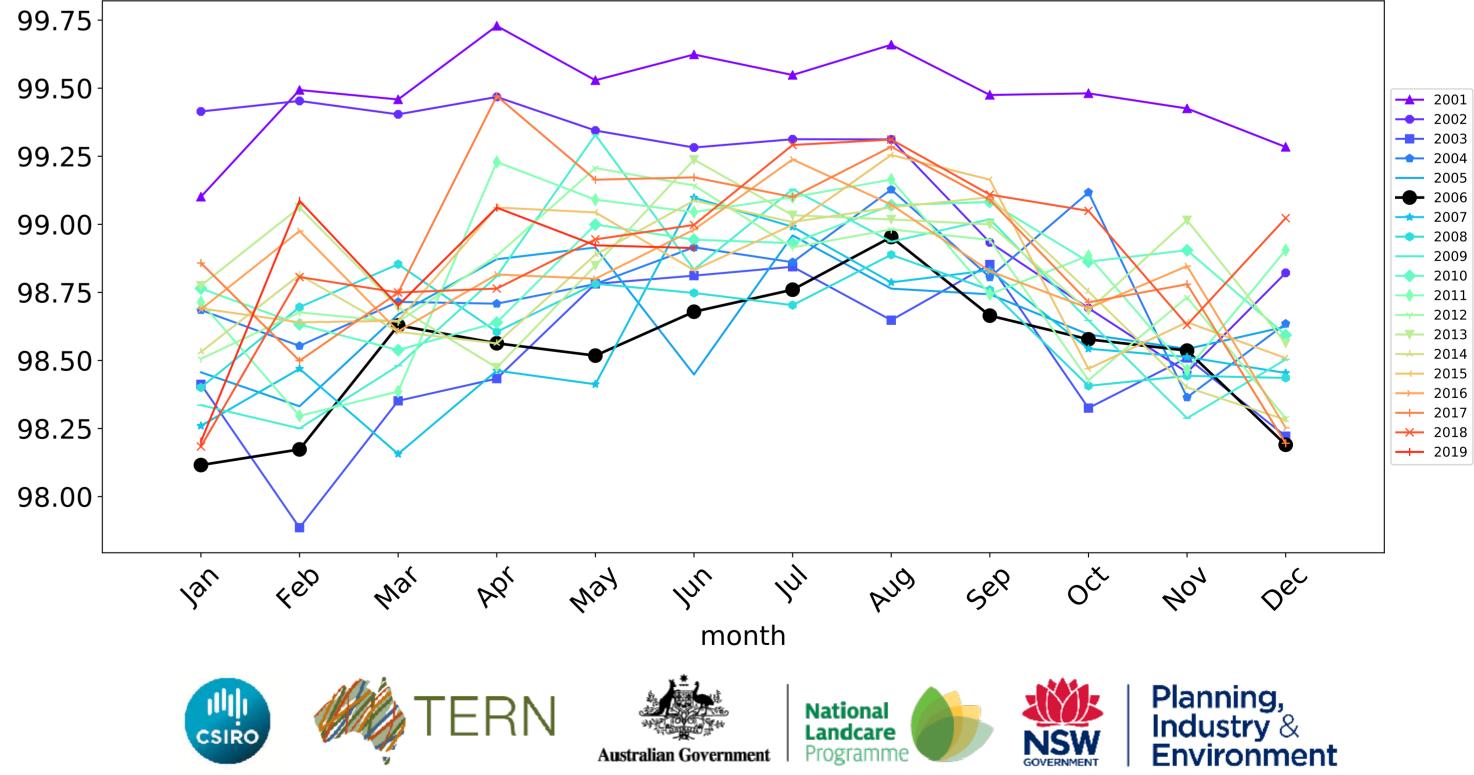
# **Conservation and natural environments timeseries**







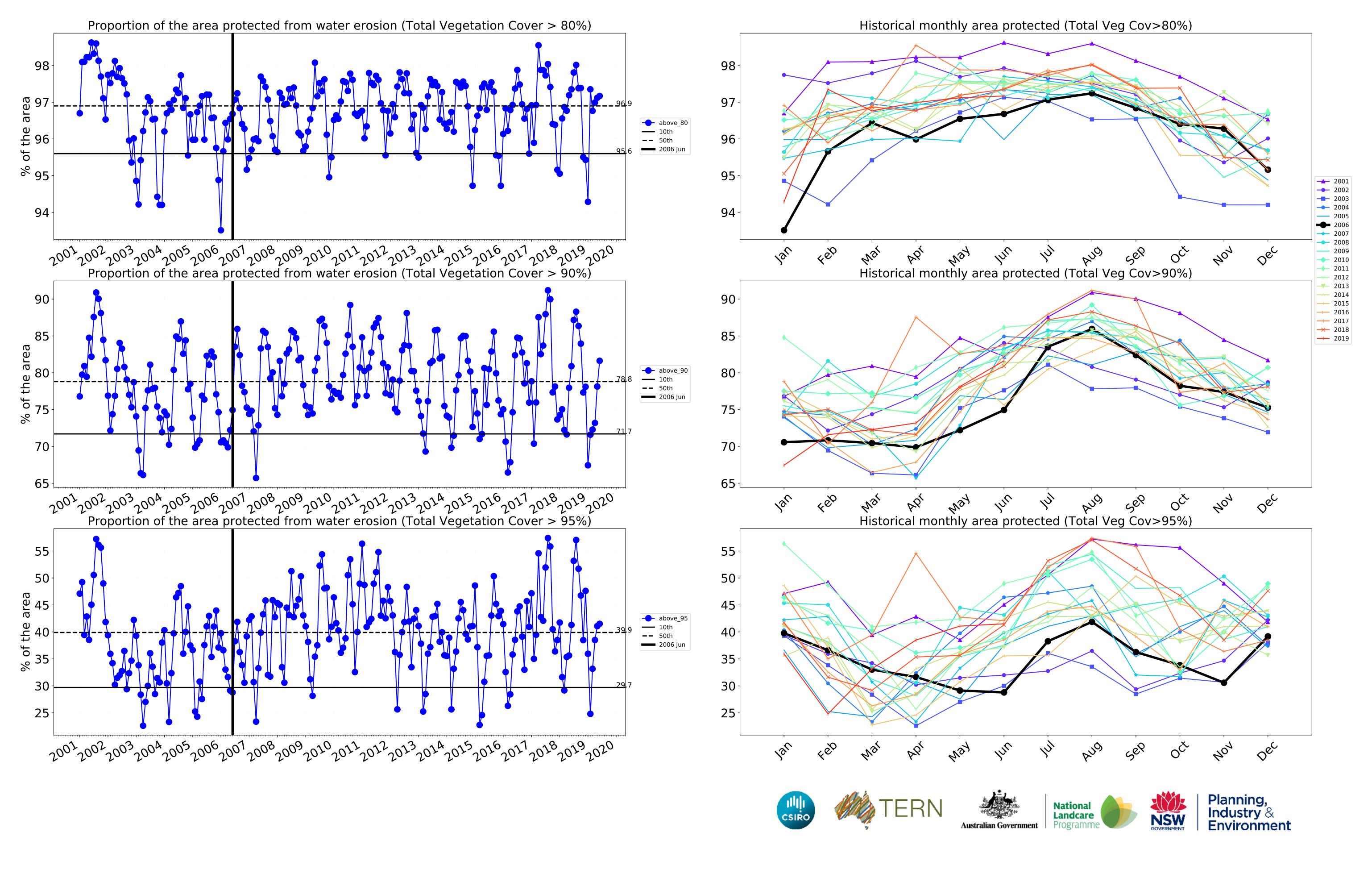




National Landcare

NSW GOVERNMENT

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



# **Conservation and natural environments non forest**

#### Land use and forest cover

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

Anomaly show how many percetage points each

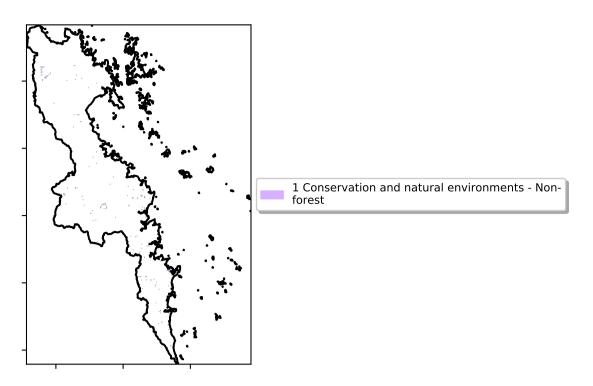
pixel is from the mean. That

pixel. The mean

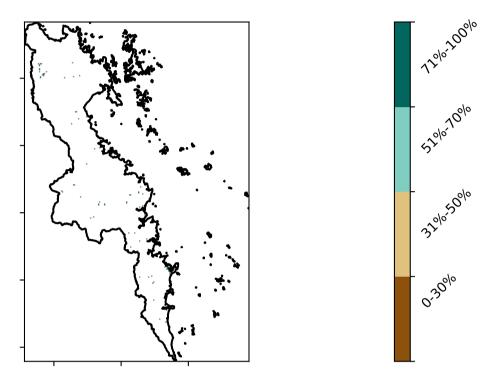
using baseline from 2001 to 2019.

is only for the month of the map

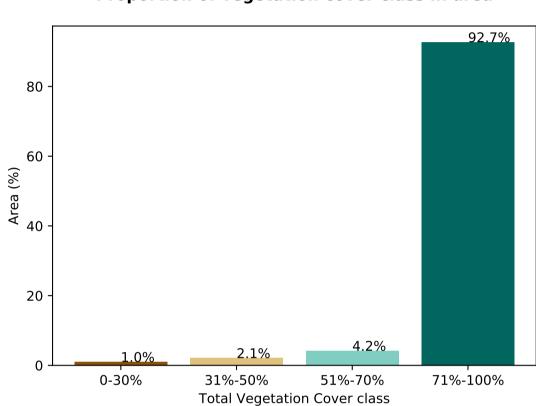
is, red pixels are about 20% lower than the mean of that



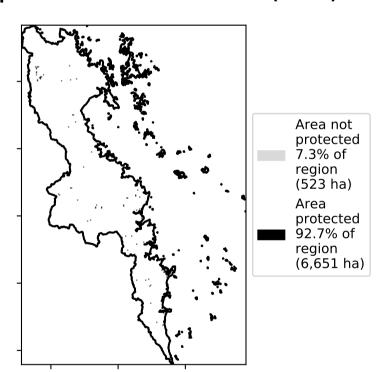
#### **Total Vegetation Cover [%]**



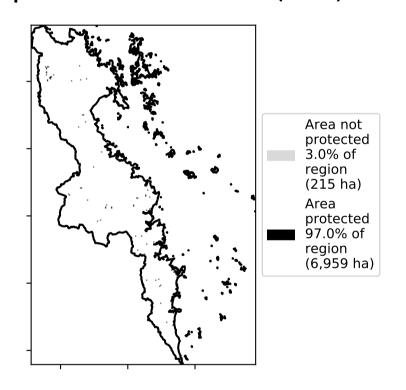
# Proportion of vegetation cover class in area



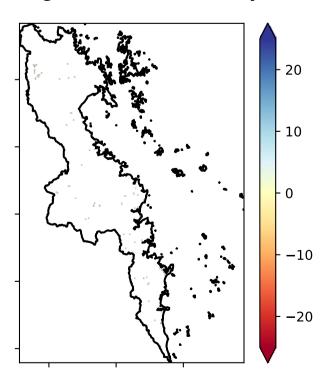
# % Area protected from water erosion (>70%)



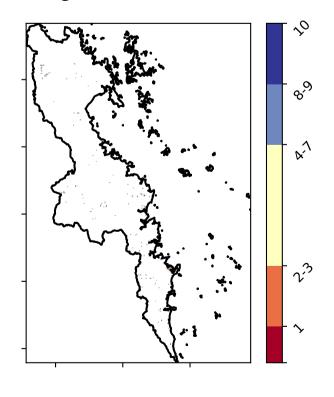
% Area protected from wind erosion (>50%)



# **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.







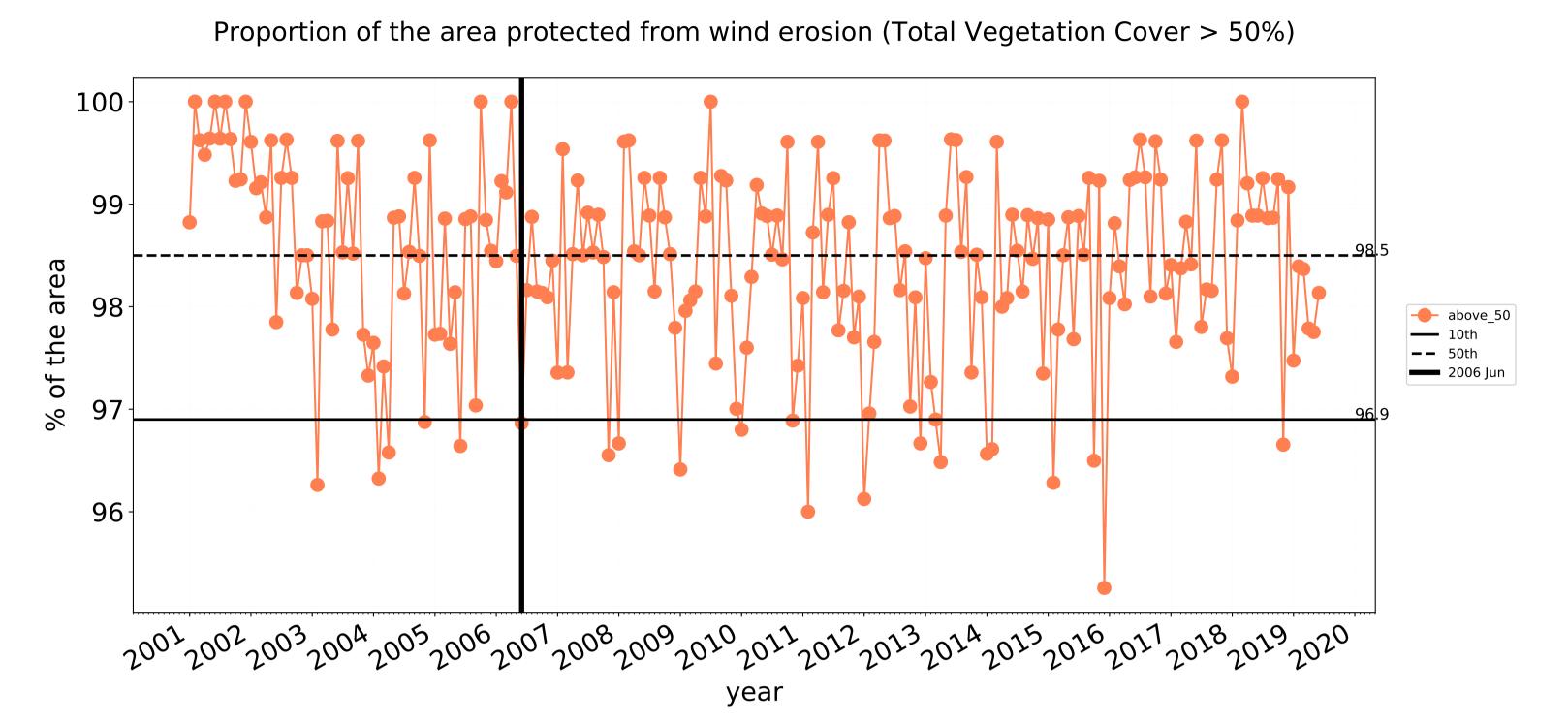


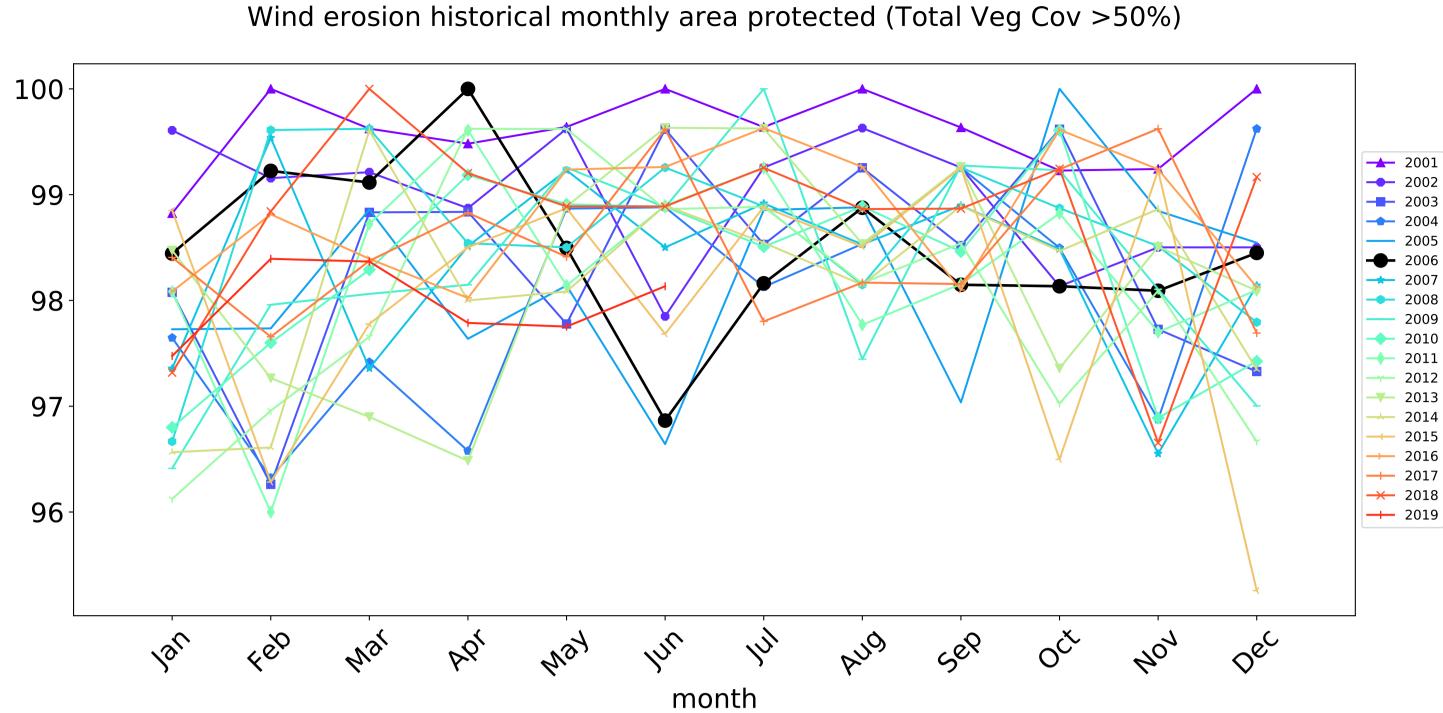


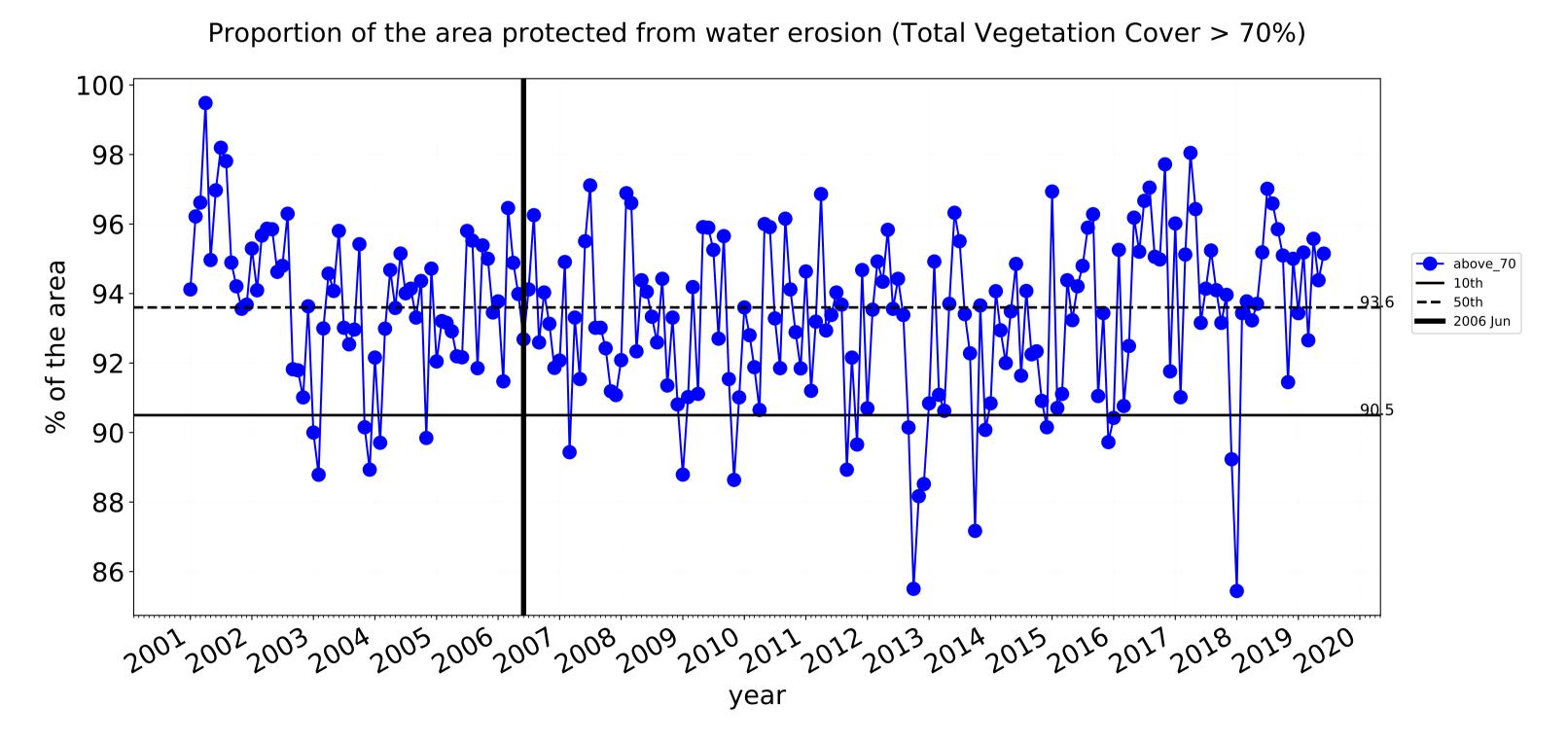


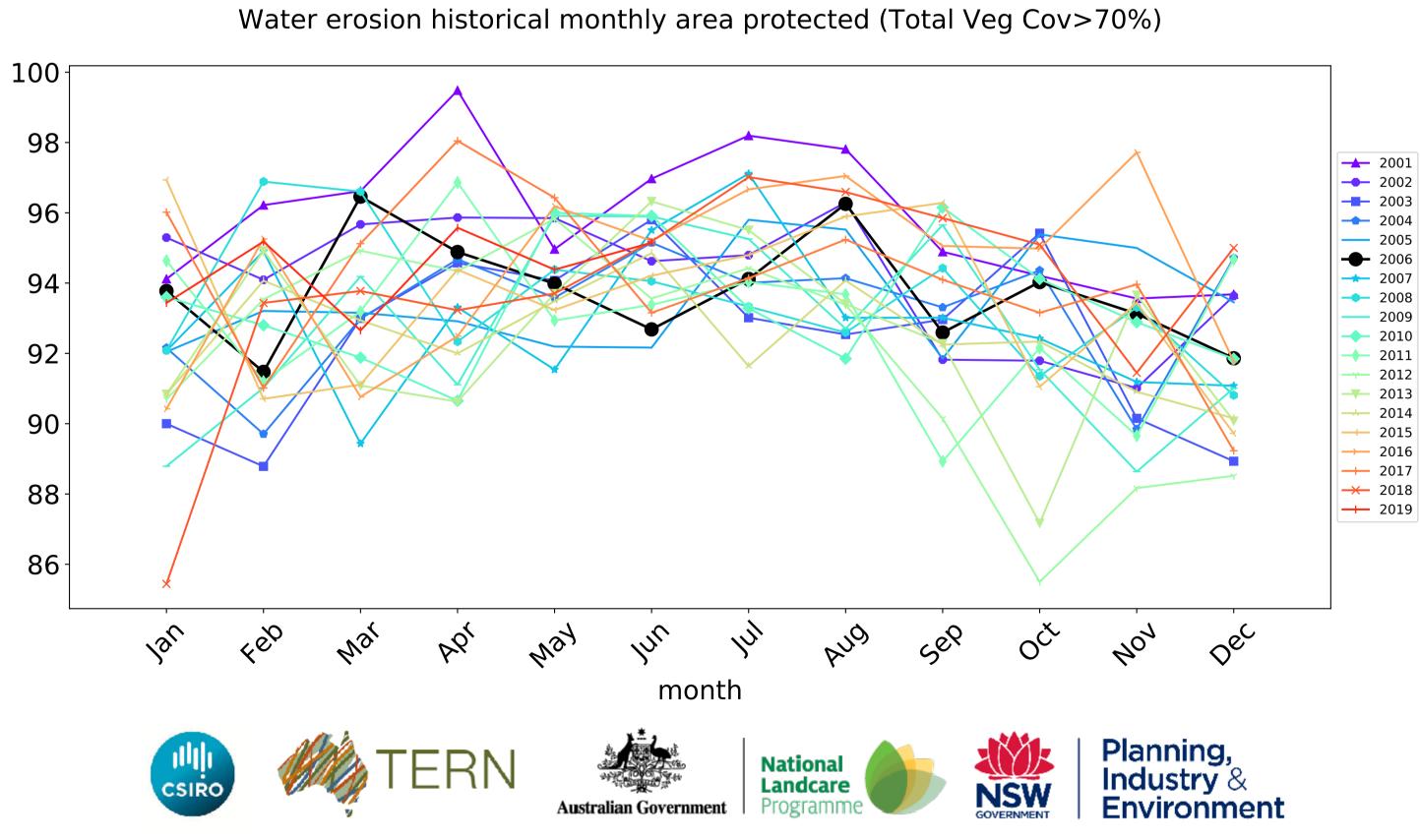


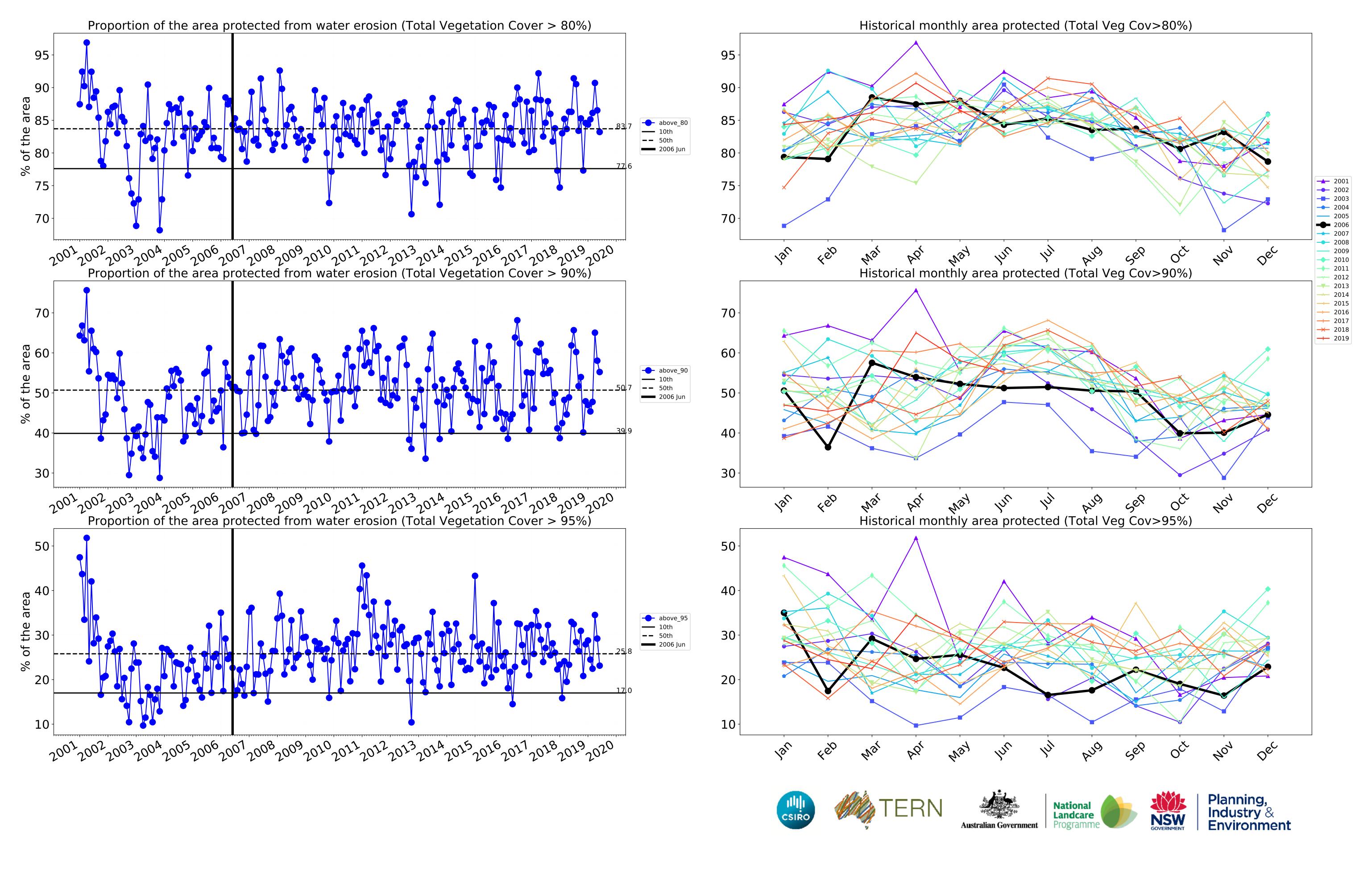
# **Conservation and natural environments non forest timeseries**











# **Conservation and natural environments Woodland forest**

#### Land use and forest cover

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

Anomaly show how many percetage points each

pixel is from the mean. That

pixel. The mean

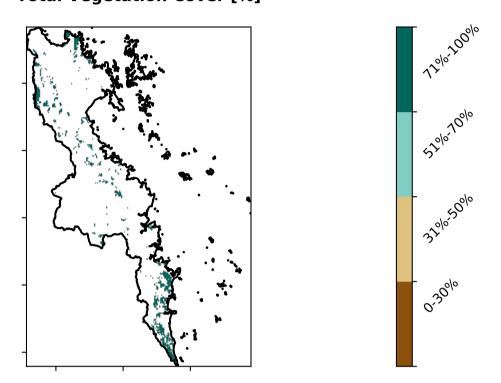
using baseline from 2001 to 2019.

is only for the month of the map

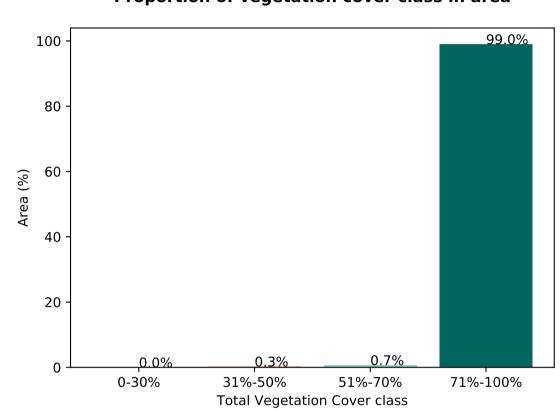
is, red pixels are about 20% lower than the mean of that



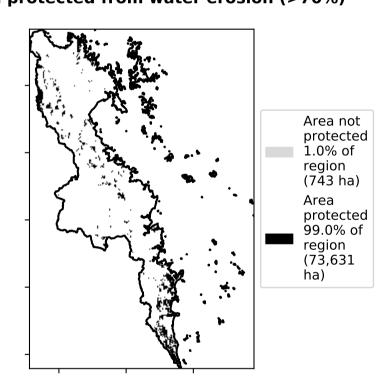
# **Total Vegetation Cover [%]**



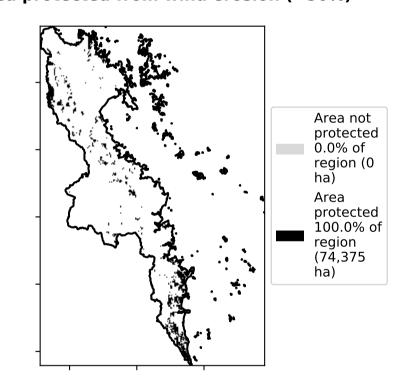
# Proportion of vegetation cover class in area



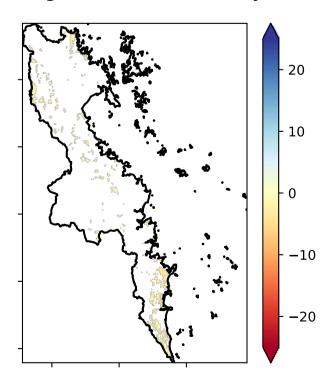
# % Area protected from water erosion (>70%)



% Area protected from wind erosion (>50%)

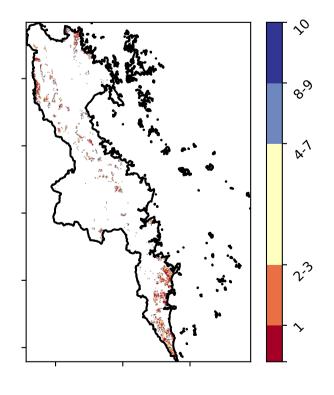


# **Total Vegetation Cover Anomaly [%]**



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 [%]





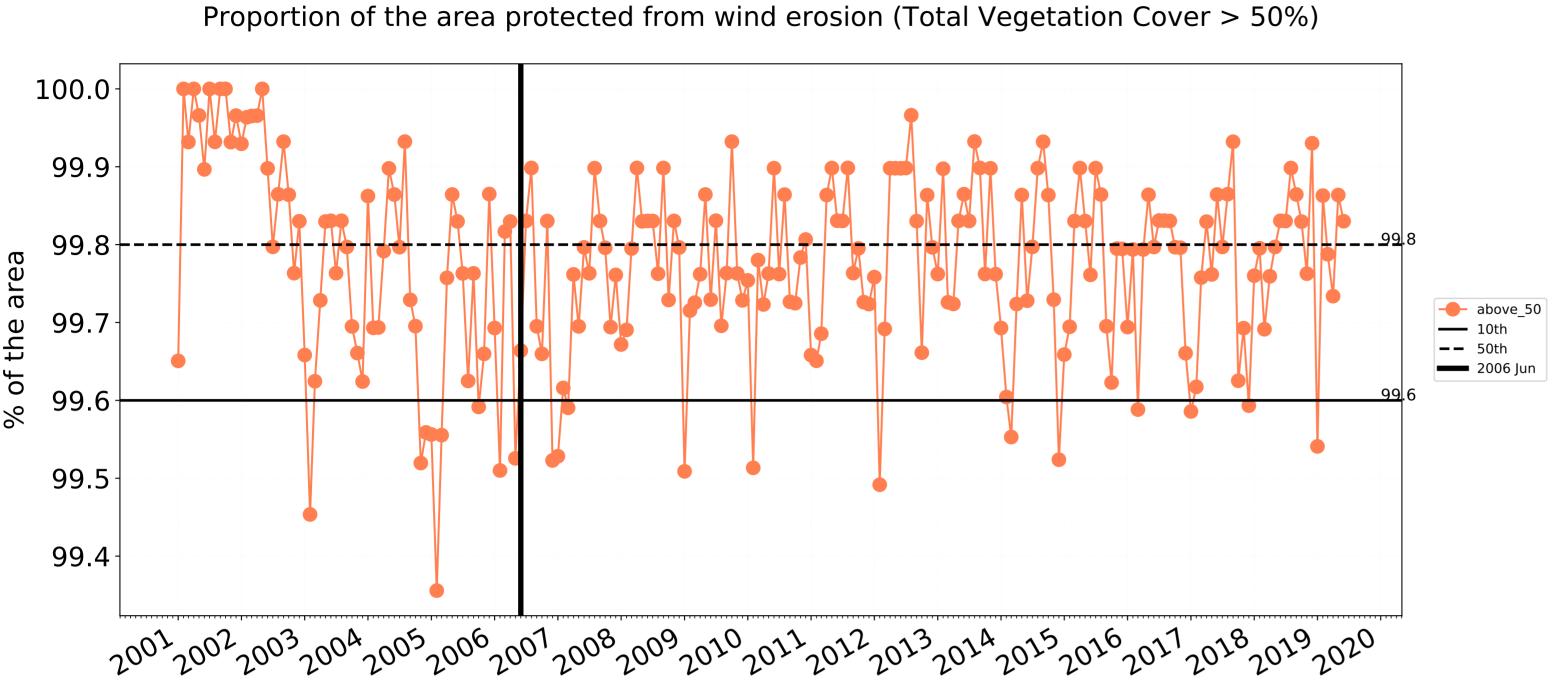


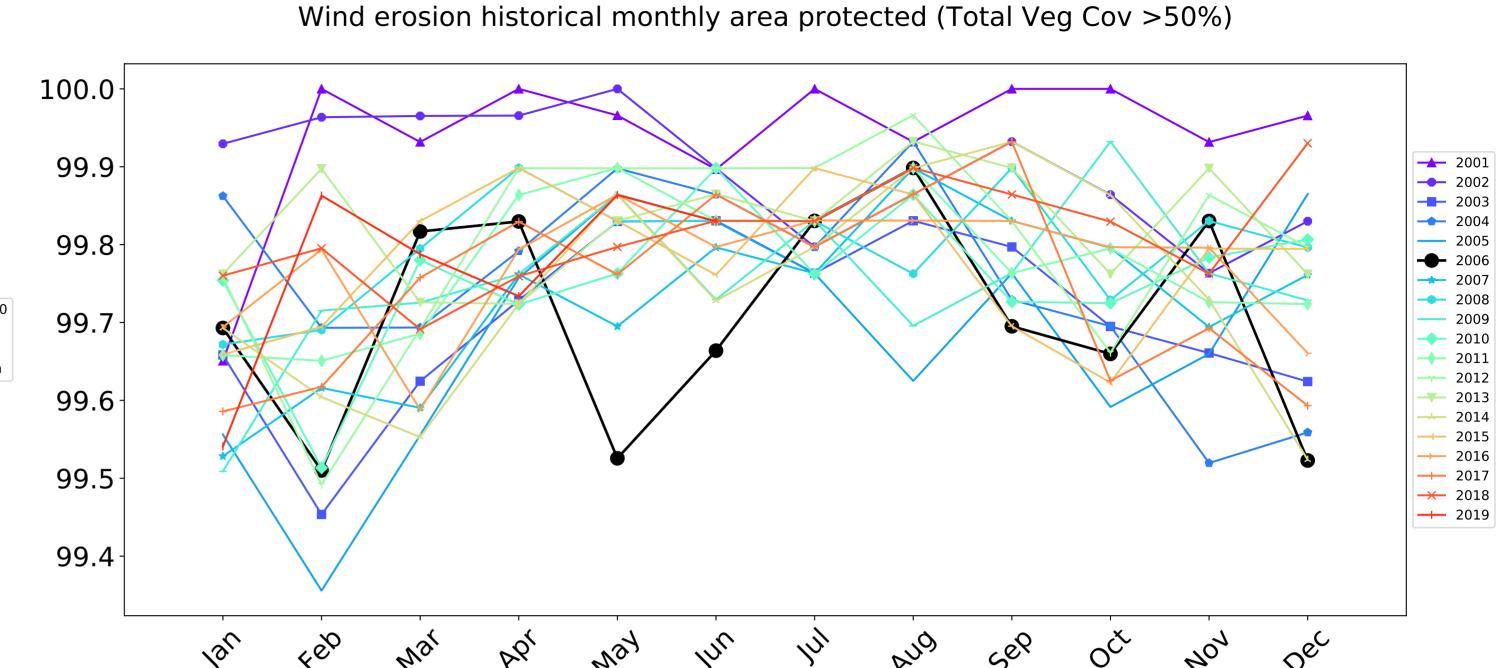




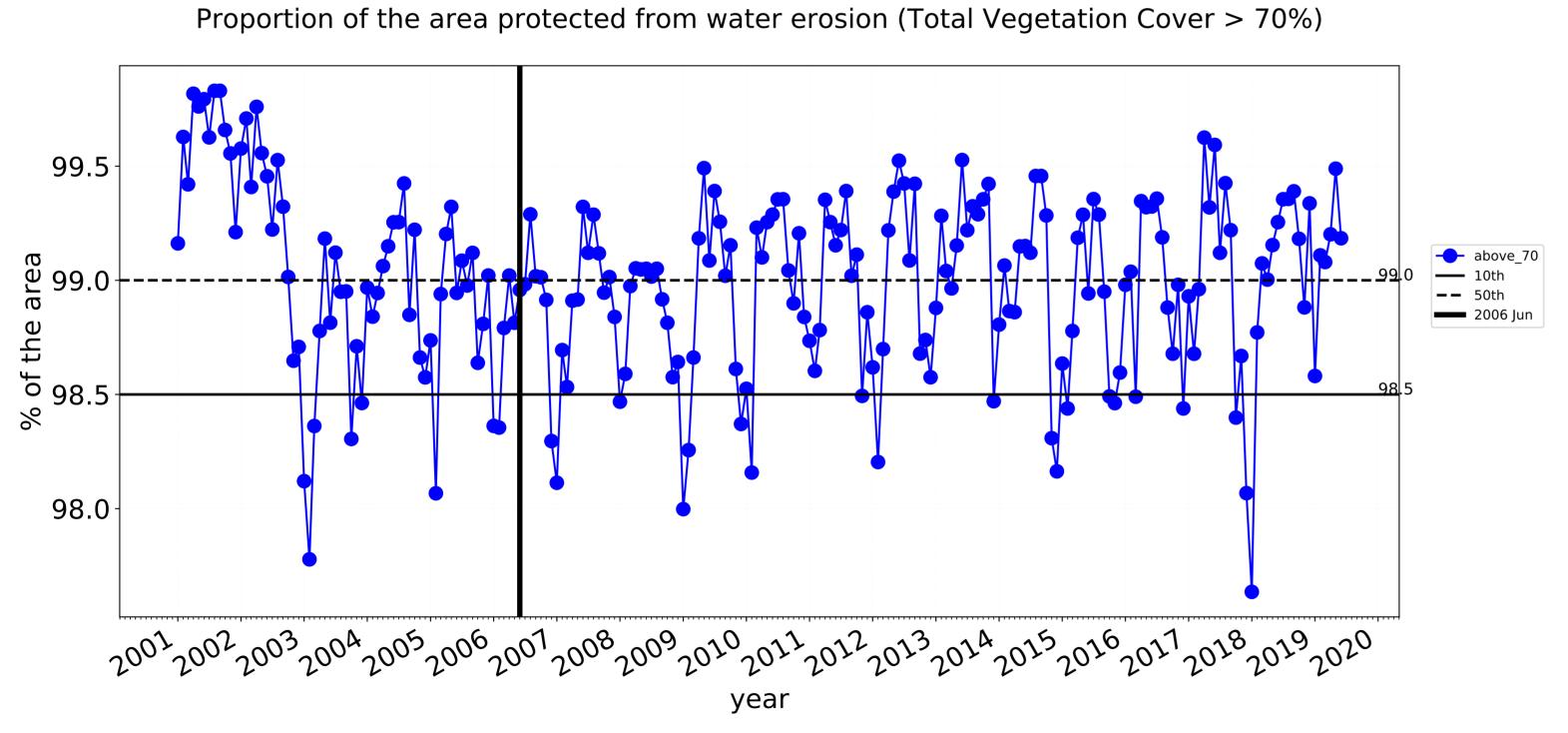


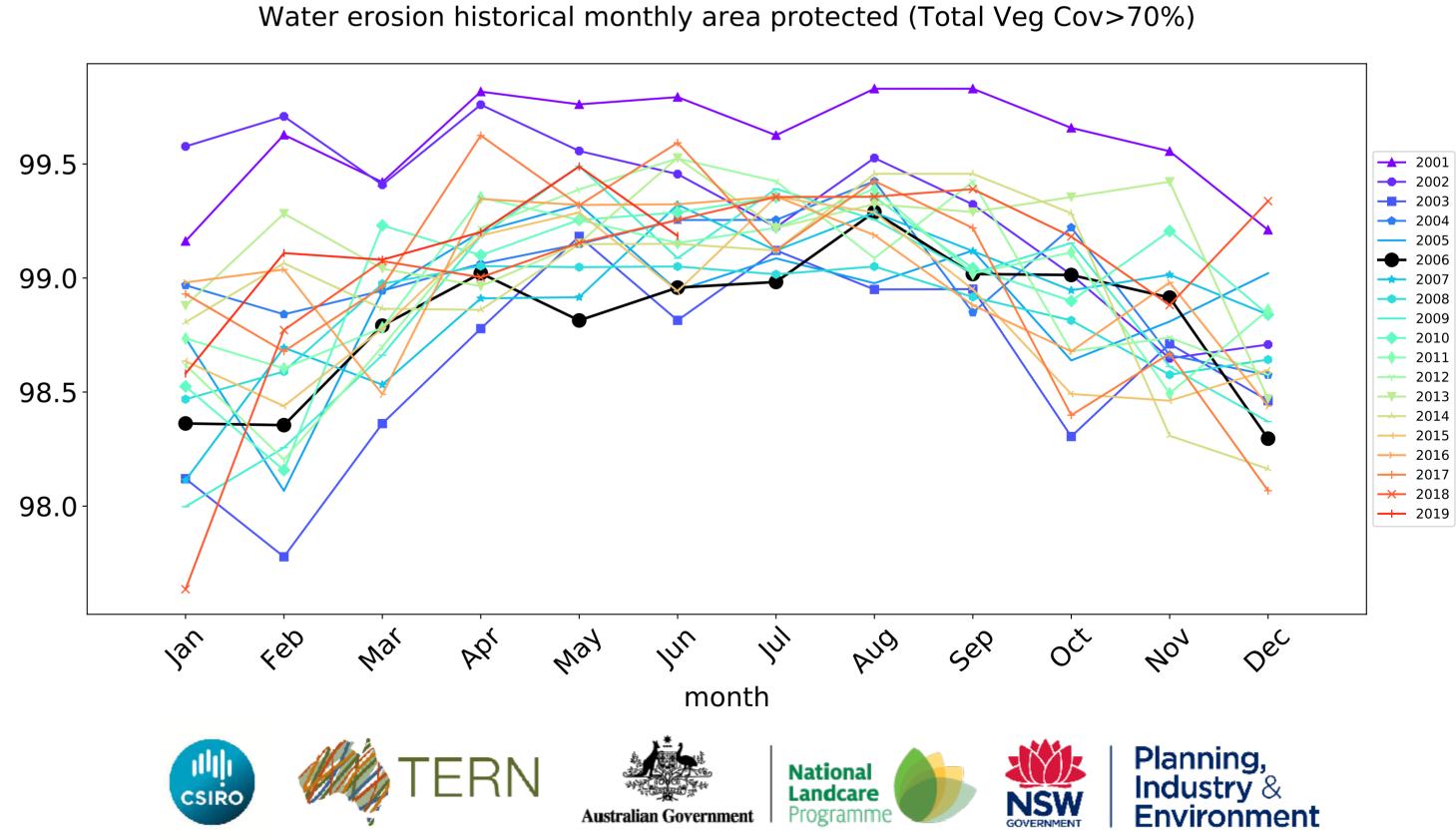


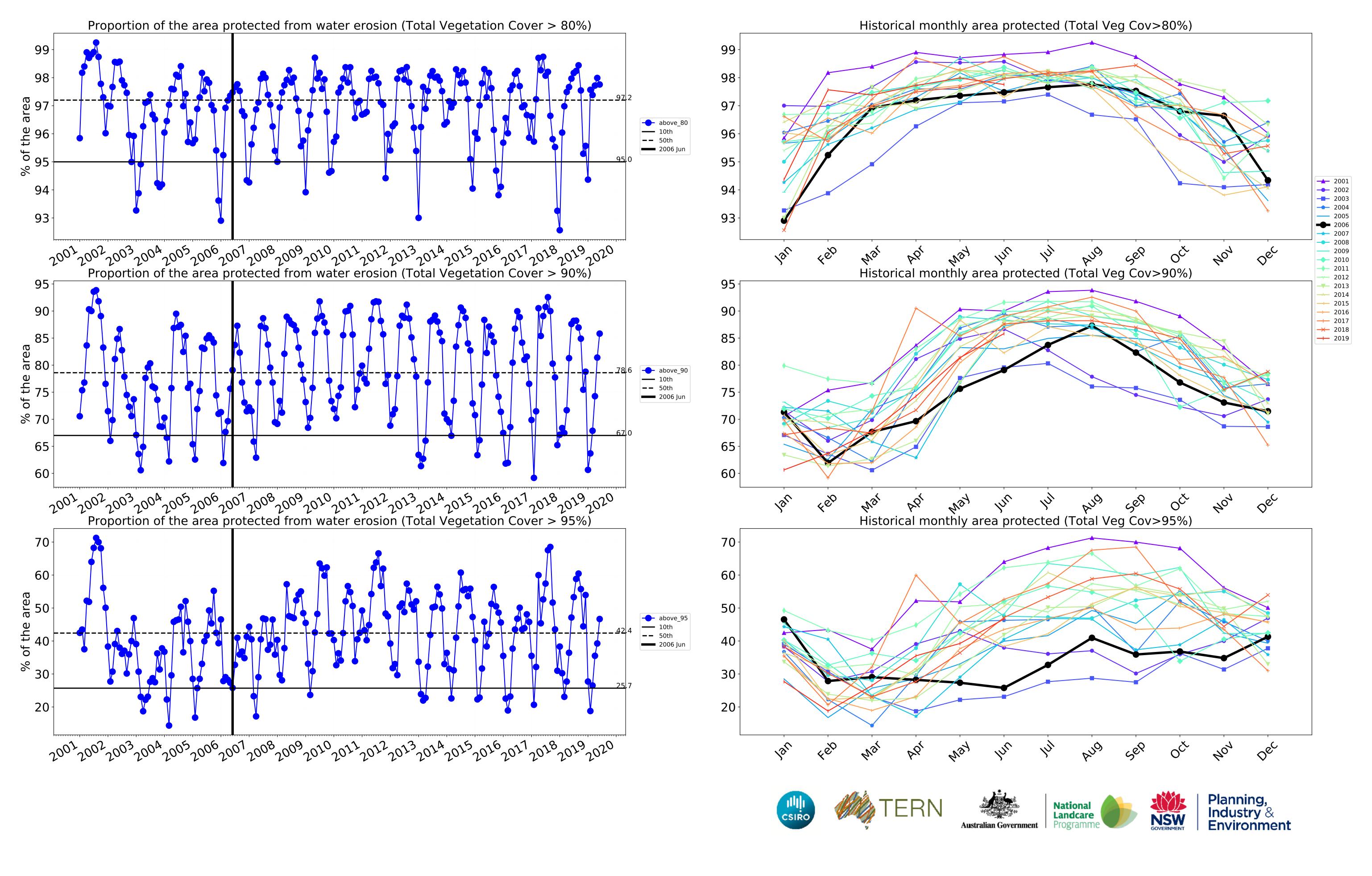




month







# **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)

Anomaly show how many percetage points each

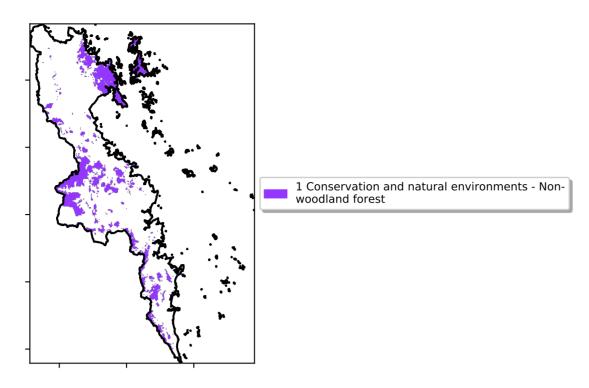
pixel is from

is, red pixels are about 20% lower than the

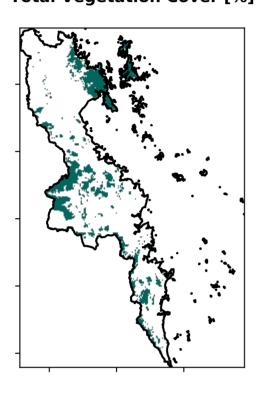
mean of that

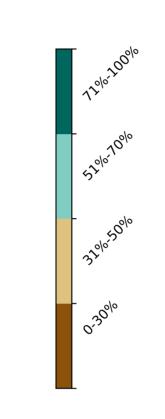
pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

the mean. That

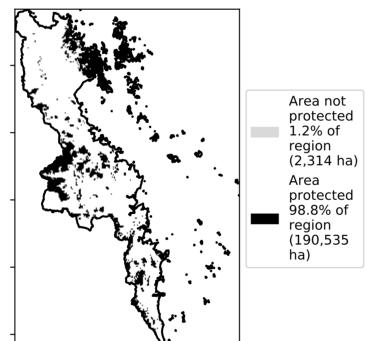


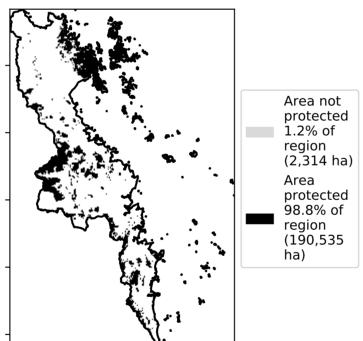
# **Total Vegetation Cover [%]**



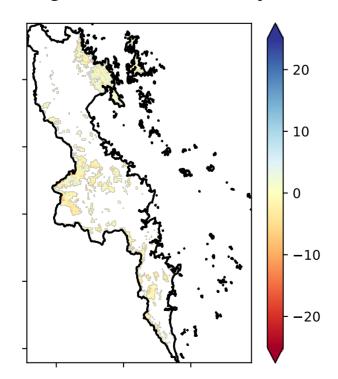


# % Area protected from water erosion (>70%)



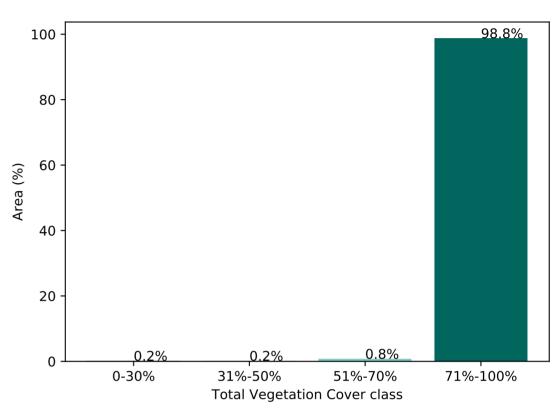


# **Total Vegetation Cover Anomaly [%]**

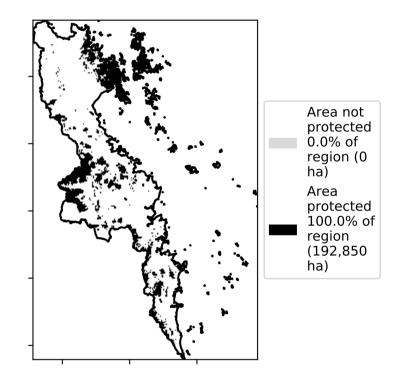


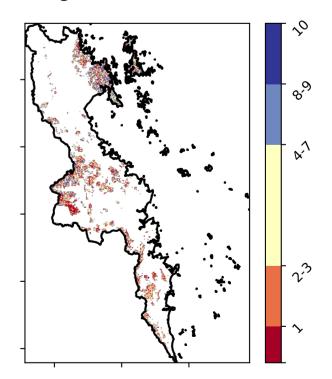
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

#### Proportion of vegetation cover class in area



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







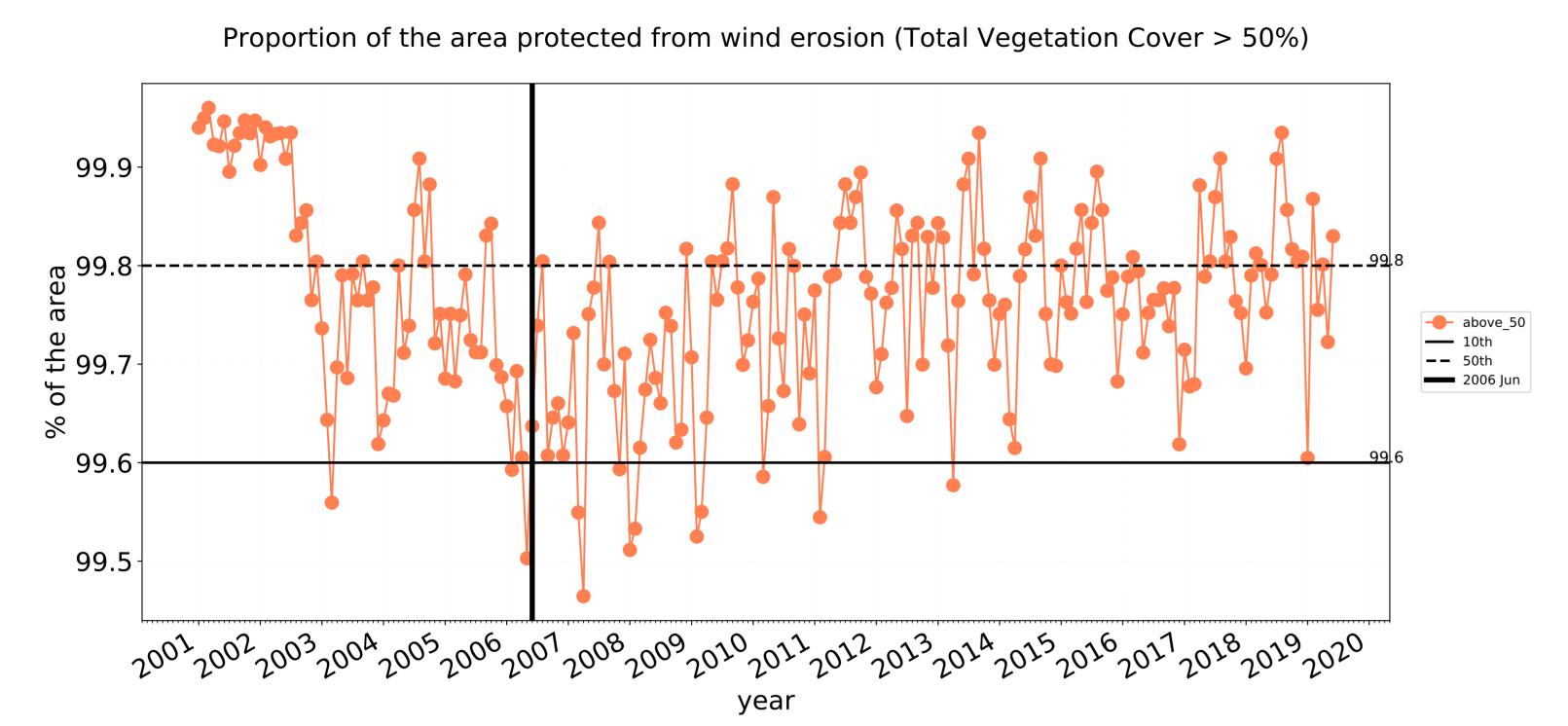




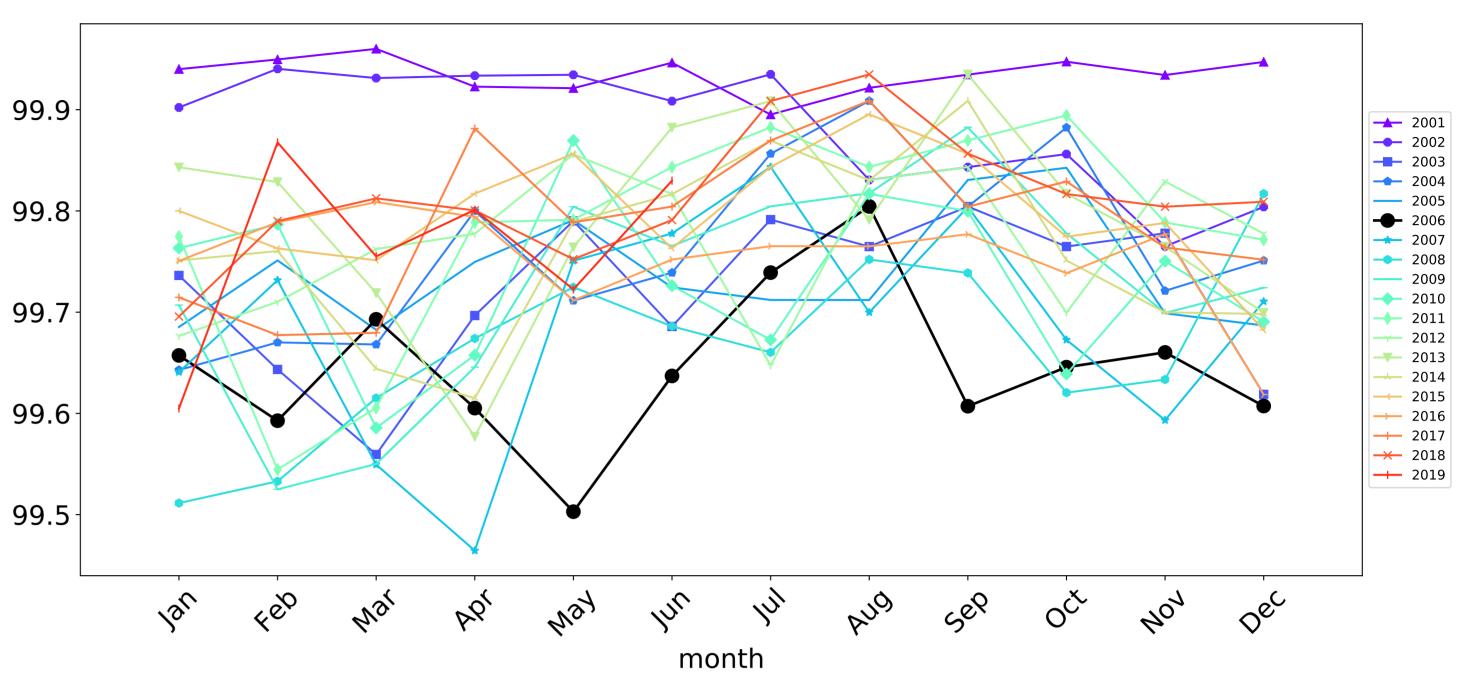




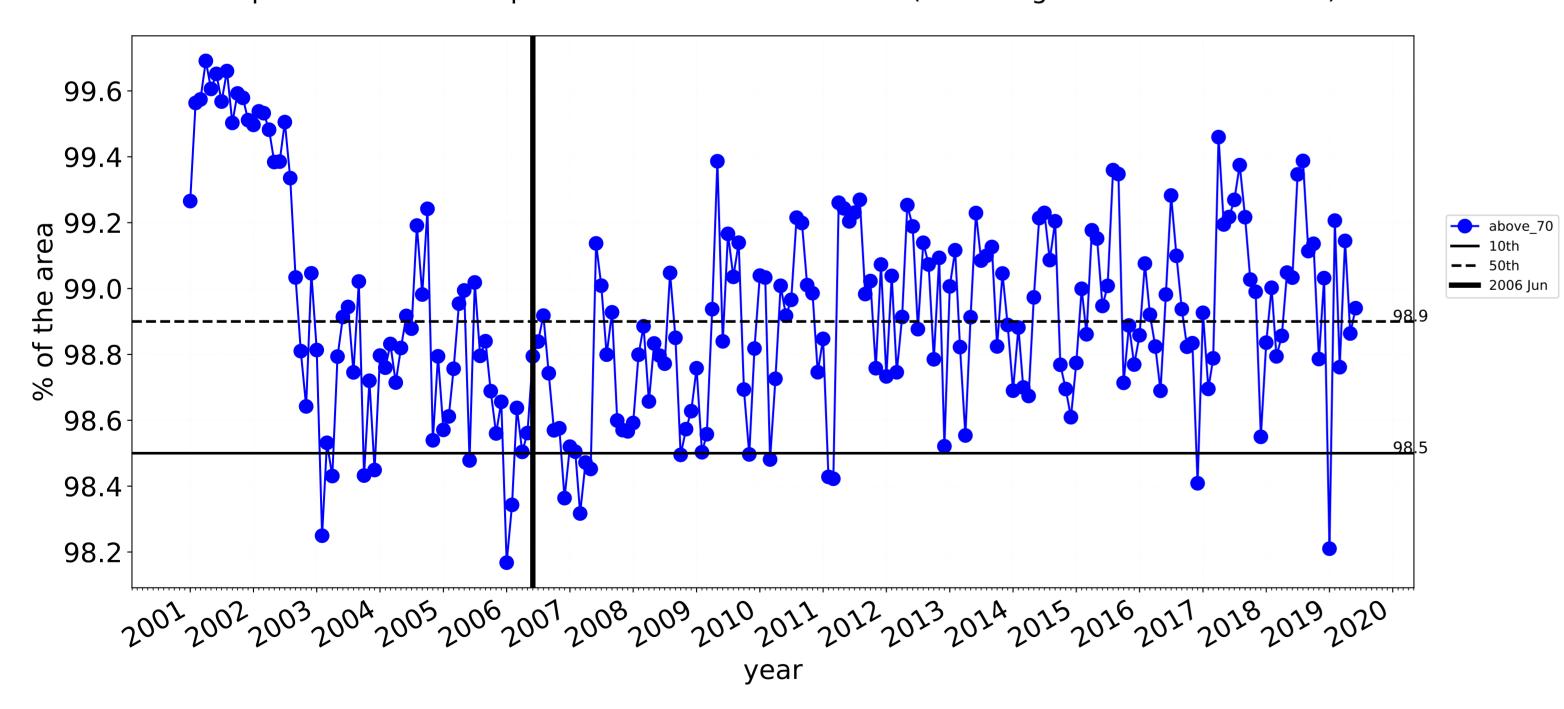




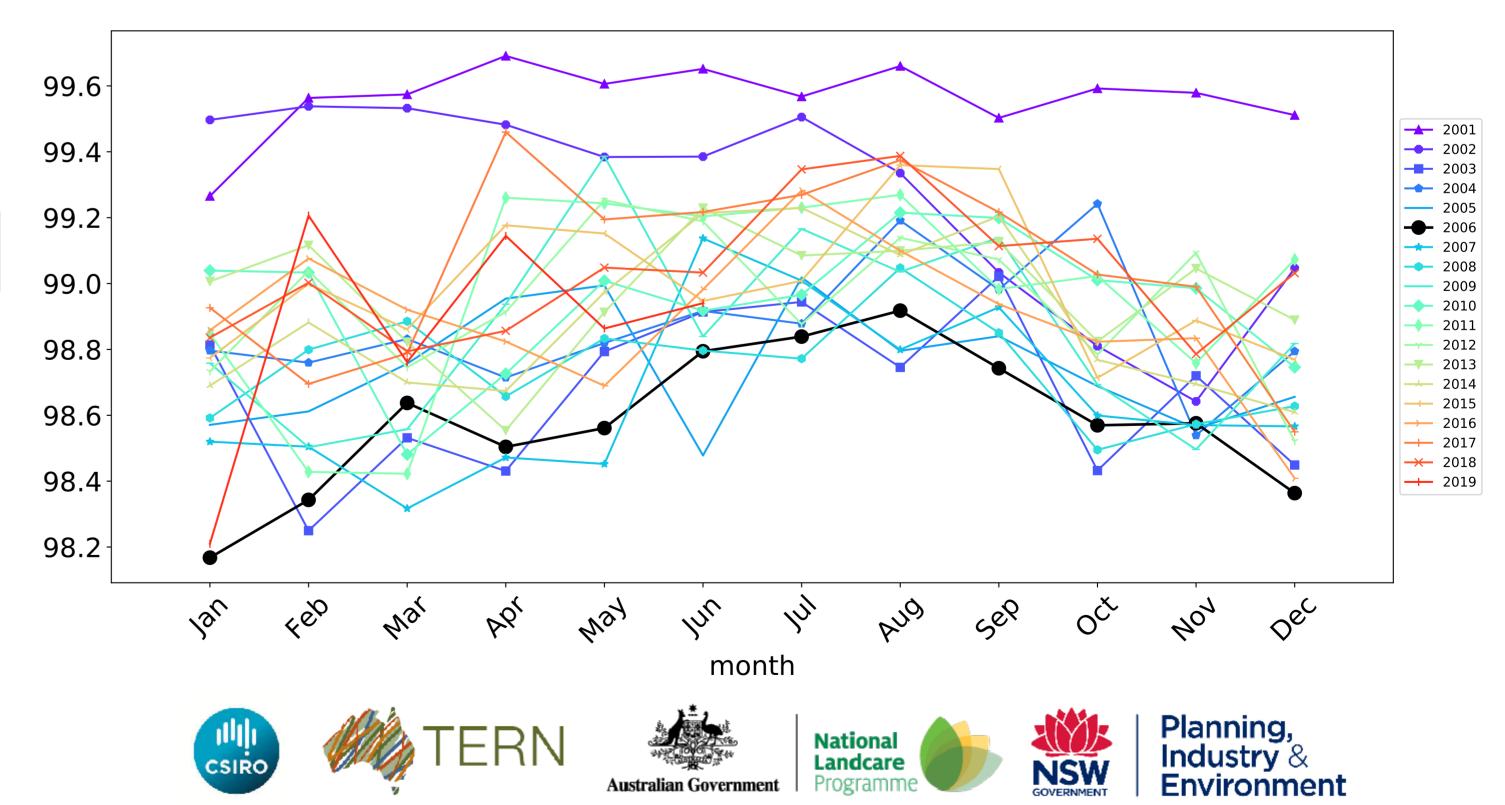
# Wind erosion historical monthly area protected (Total Veg Cov >50%)

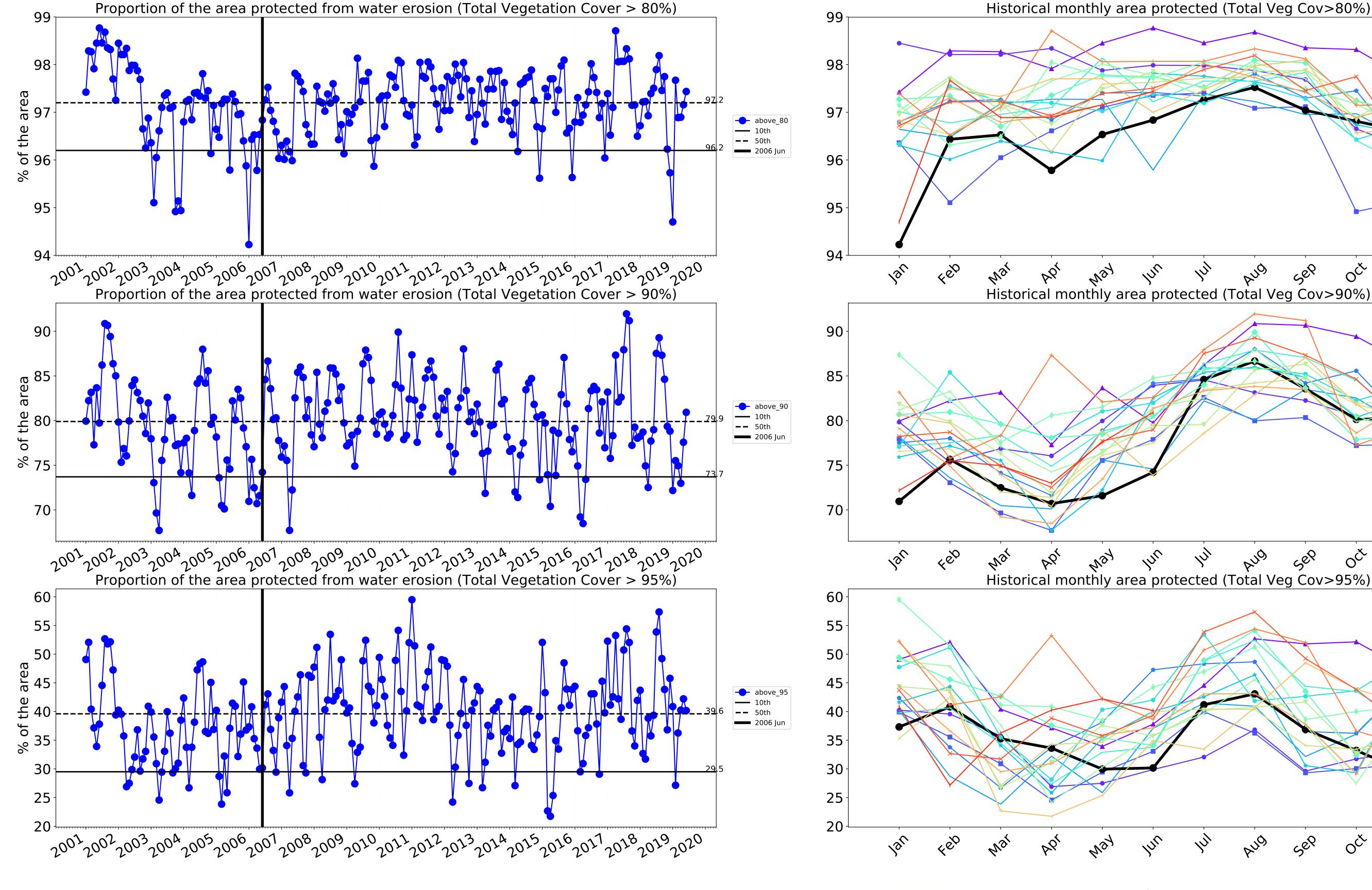


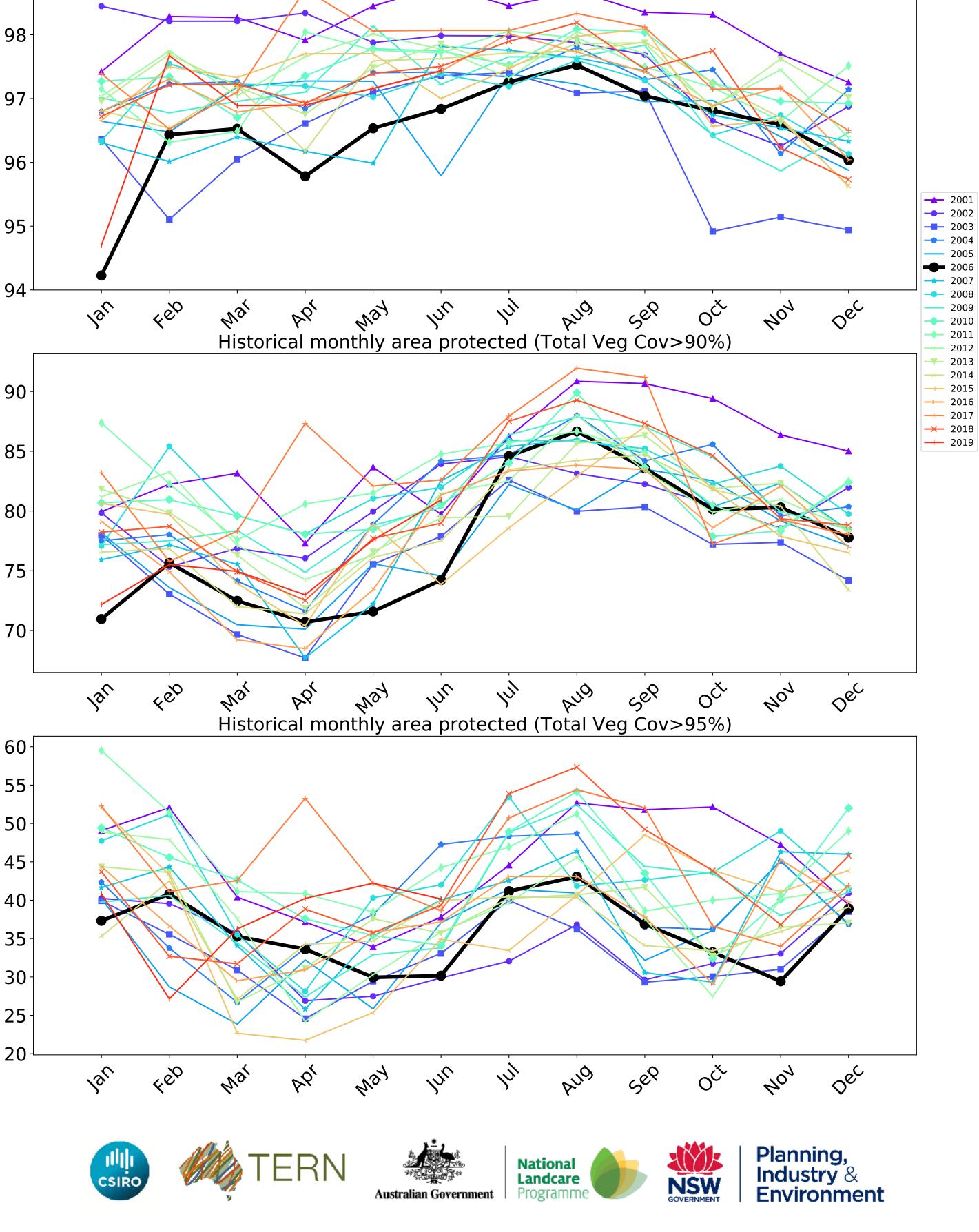
Proportion of the area protected from water erosion (Total Vegetation Cover > 70%)



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







# **Agriculture**

# Land use and forest cover

Catchment Scale

of Australia (2018)

(2018) and Forests

of Australia (2018)

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

Derived from

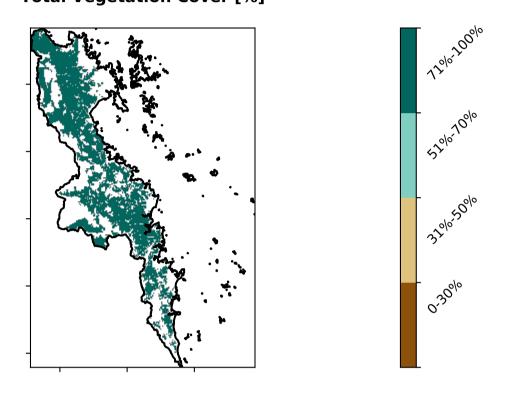
Use of Australia

Land Use and Forests

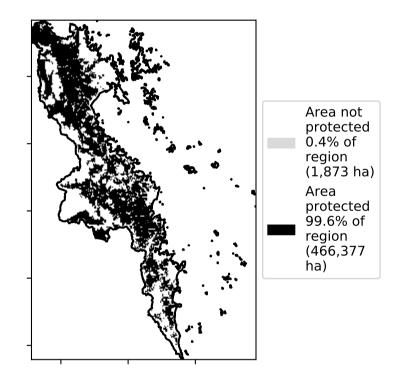
Catchment Scale Land

# 1 Agriculture - Grazing - Non forest 2 Agriculture - Grazing - Woodland forest 3 Agriculture - Grazing - Non-woodland forest 4 Agriculture - Grazing - Irrigated 5 Agriculture - Cropping - Irrigated 6 Agriculture - Horticulture - Non-irrigated 7 Agriculture - Horticulture - Irrigated

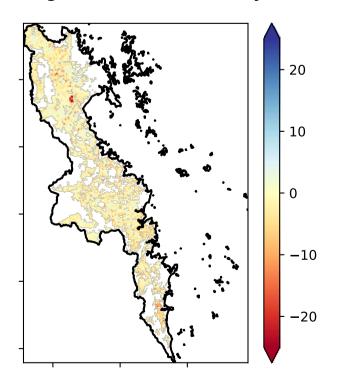
# Total Vegetation Cover [%]



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

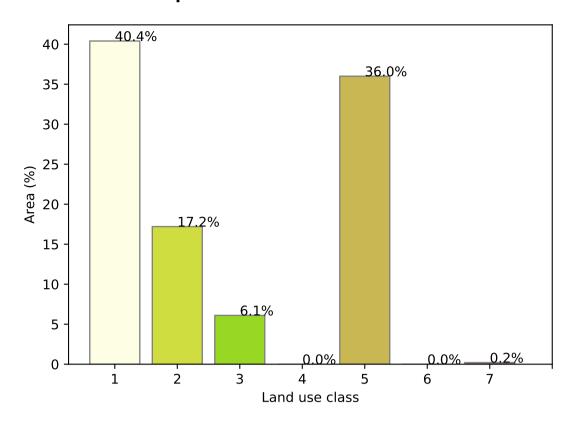


# **Total Vegetation Cover Anomaly [%]**

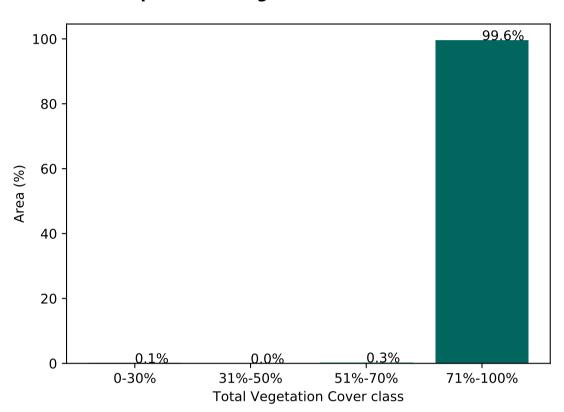


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

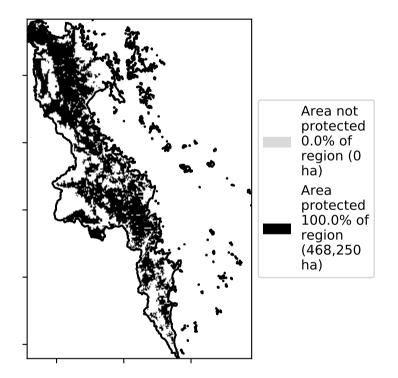
#### Proportion of each land class in area

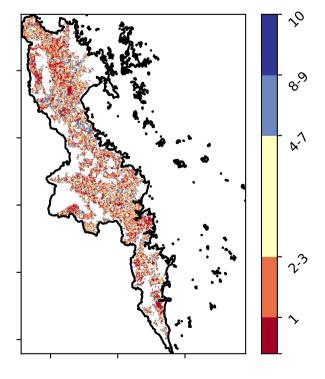


# Proportion of vegetation cover class in area



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









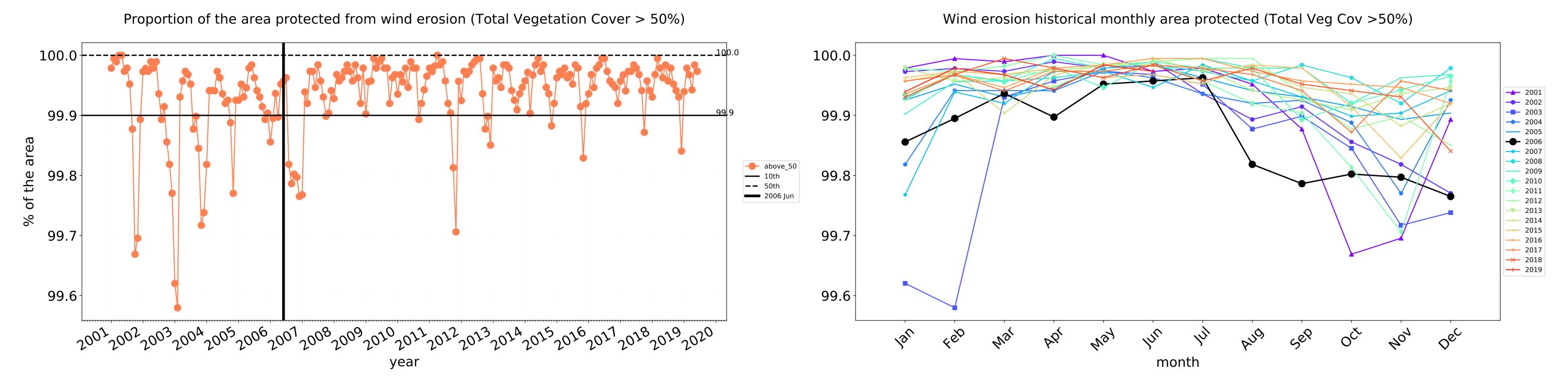


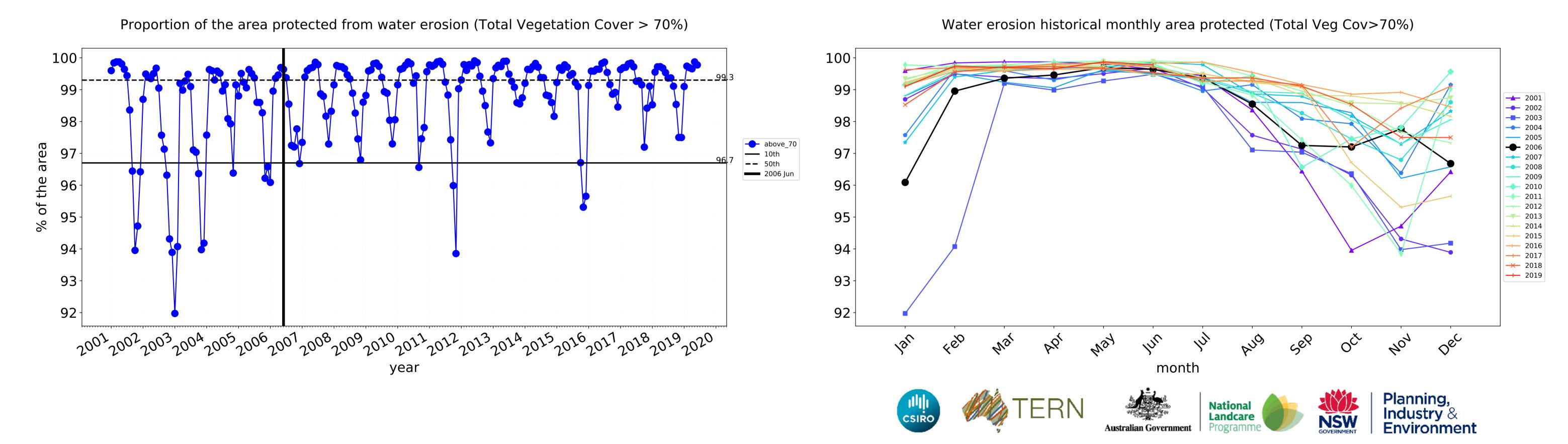


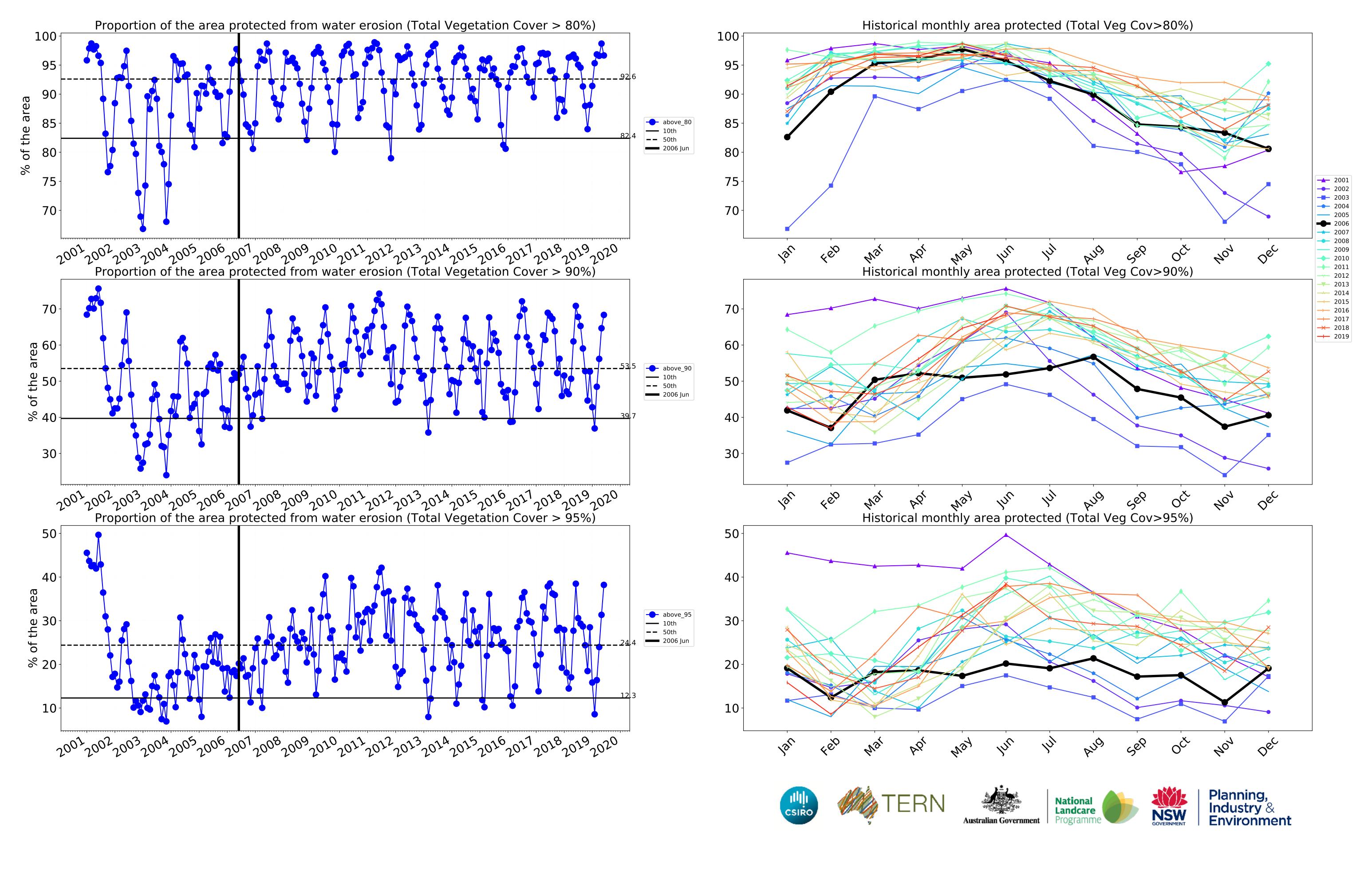




# **Agriculture timeseries**







# Grazing

#### Land use and forest cover

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

# 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

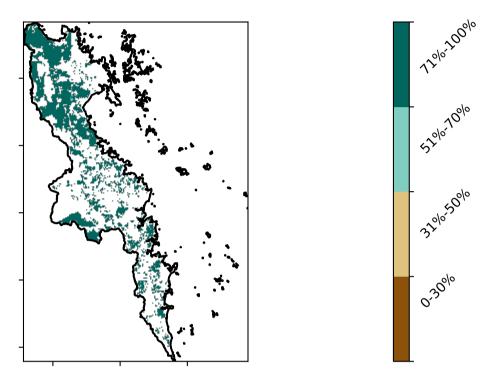
using baseline from 2001 to 2019.

is only for the month of the map

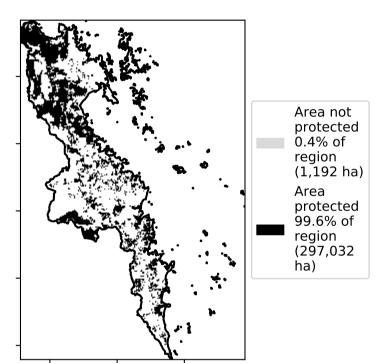
is, red pixels are about 20% lower than the mean of that

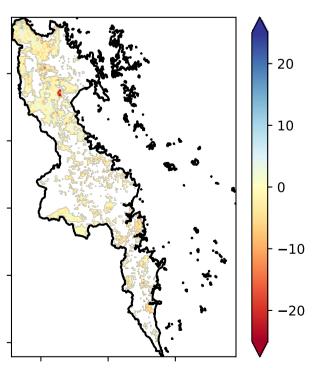
Catchment Scale

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



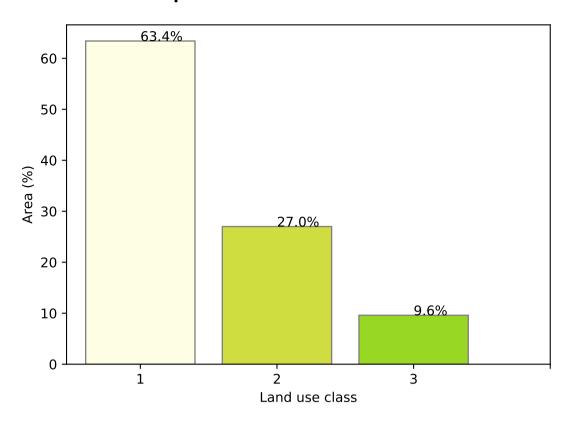
% Area protected from water erosion (>70%)



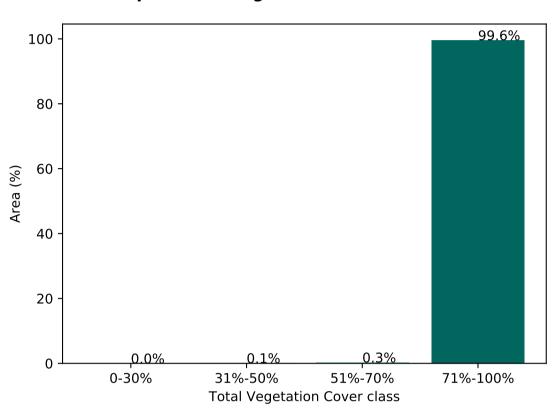


Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of the map using baseline from 2001 to 2019.

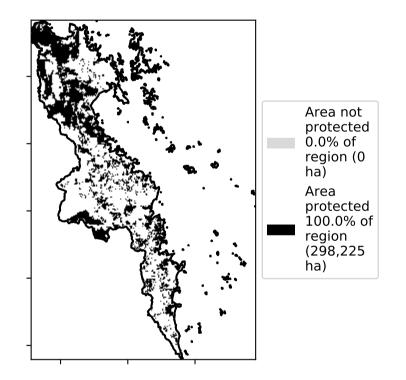
#### Proportion of each land class in area



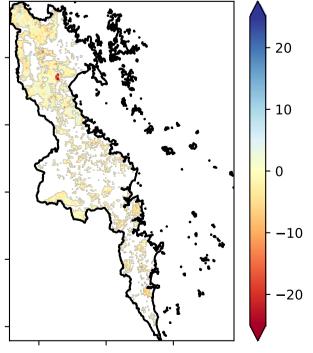
Proportion of vegetation cover class in area



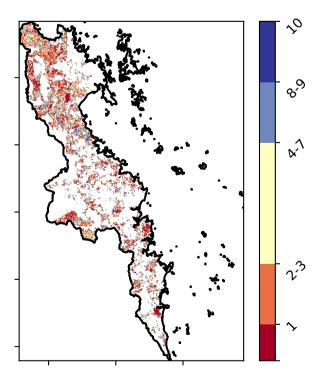
% Area protected from wind erosion (>50%)



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



records for that month of







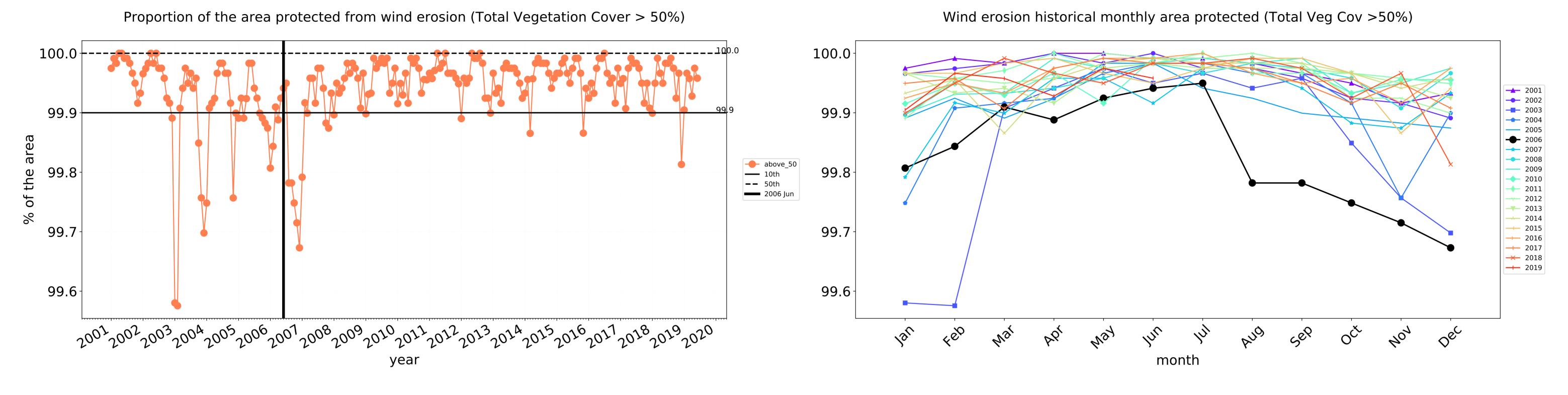


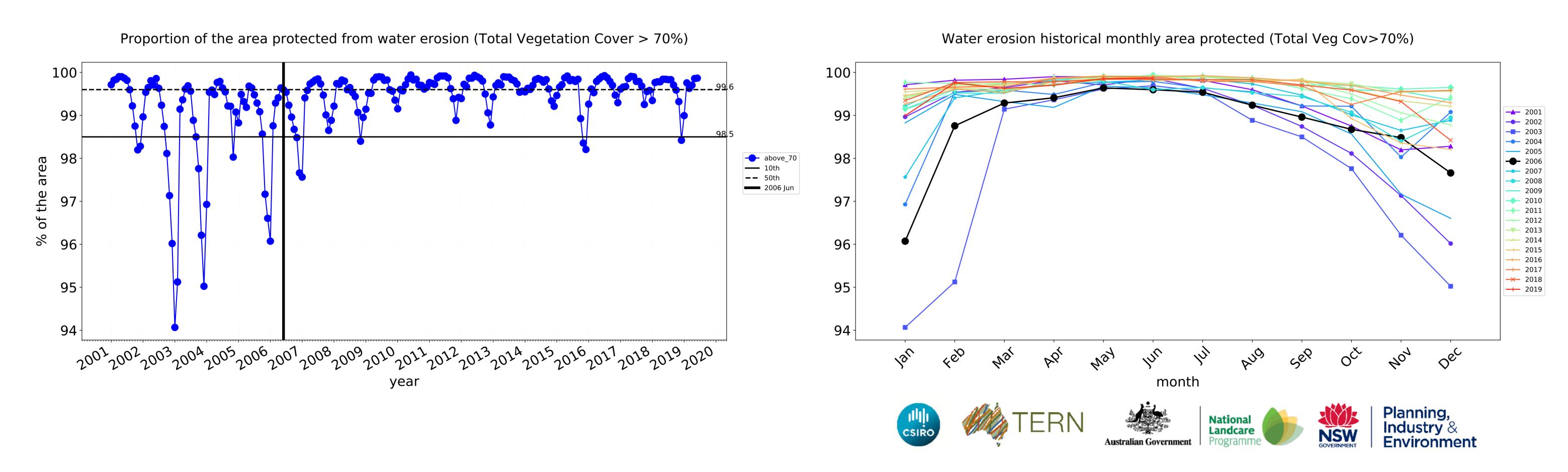


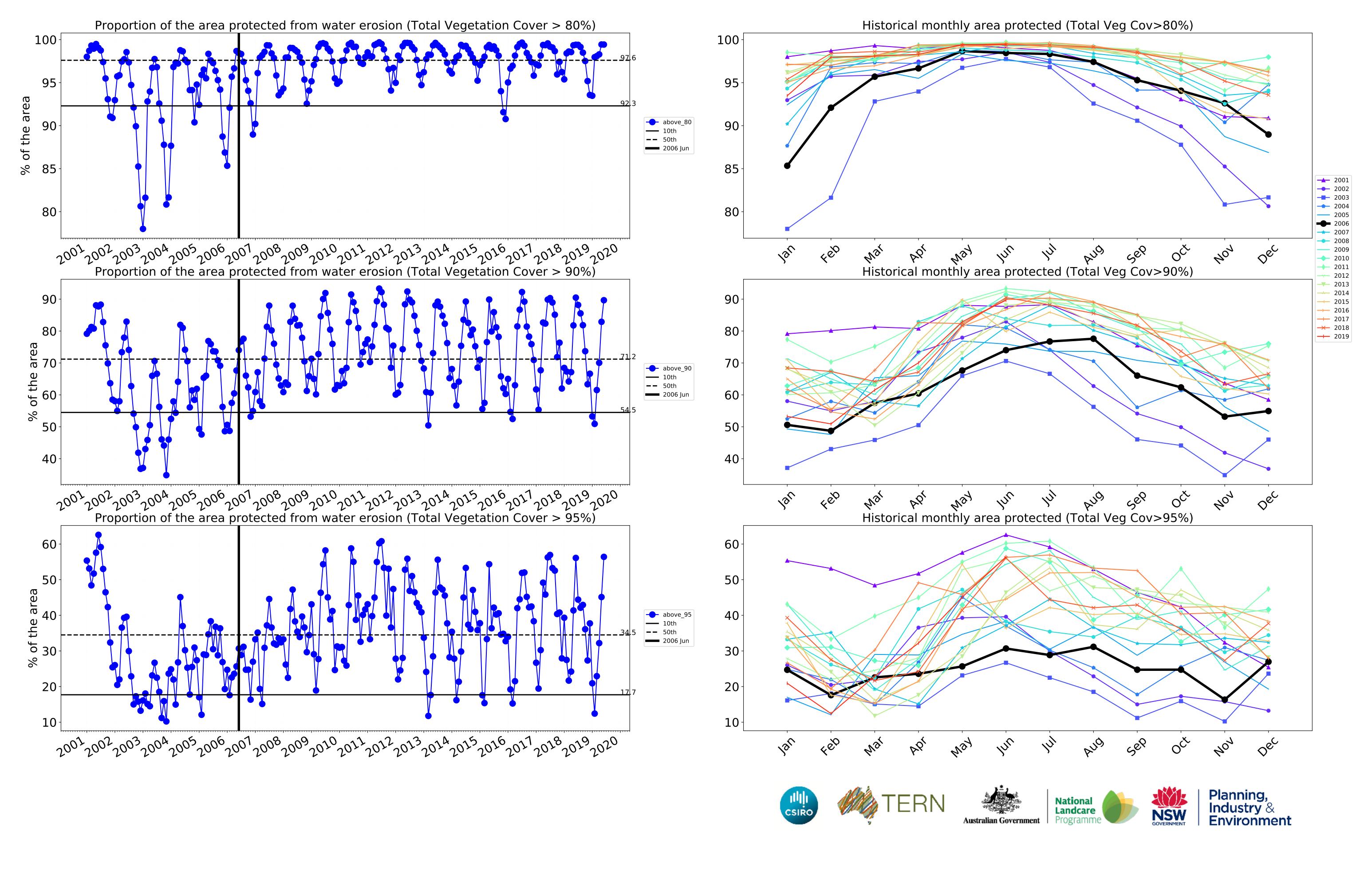




# **Grazing timeseries**

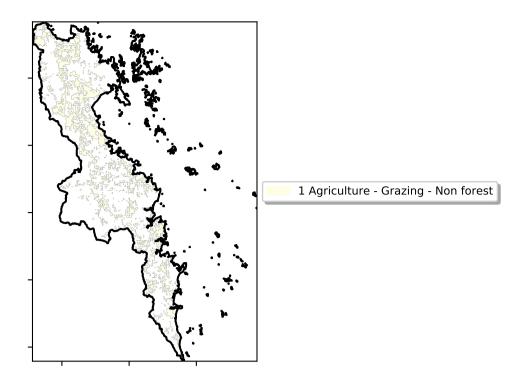






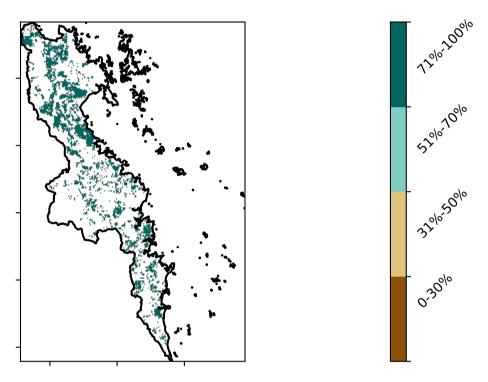
# **Grazing non forest**

#### Land use and forest cover

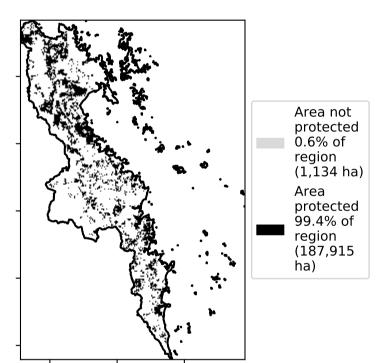


Catchment Scale Land Use and Forests of Australia (2018) Derived from Catchment Scale Land Use of Australia (2018) and Forests of Australia (2018)

# **Total Vegetation Cover [%]**



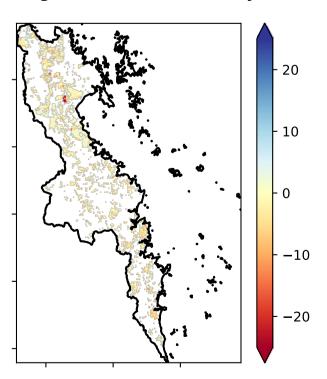
# % Area protected from water erosion (>70%)



Anomaly show how many percetage points each

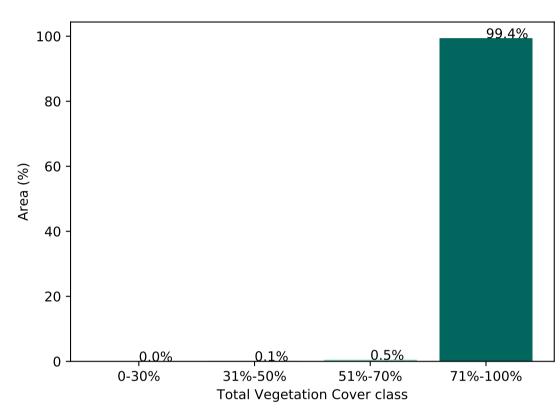
points each pixel is from the mean. That is, red pixels are about 20% lower than the mean of that pixel. The mean is only for the month of the map using baseline from 2001 to 2019.

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

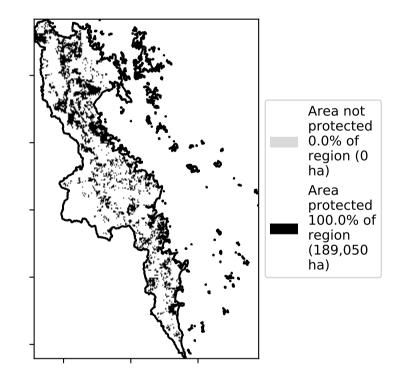


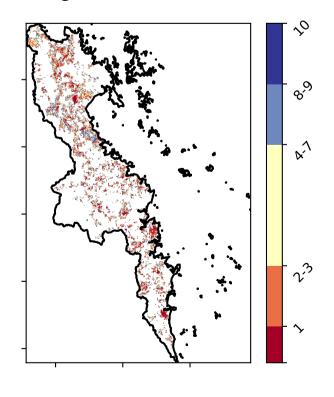
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

# Proportion of vegetation cover class in area



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









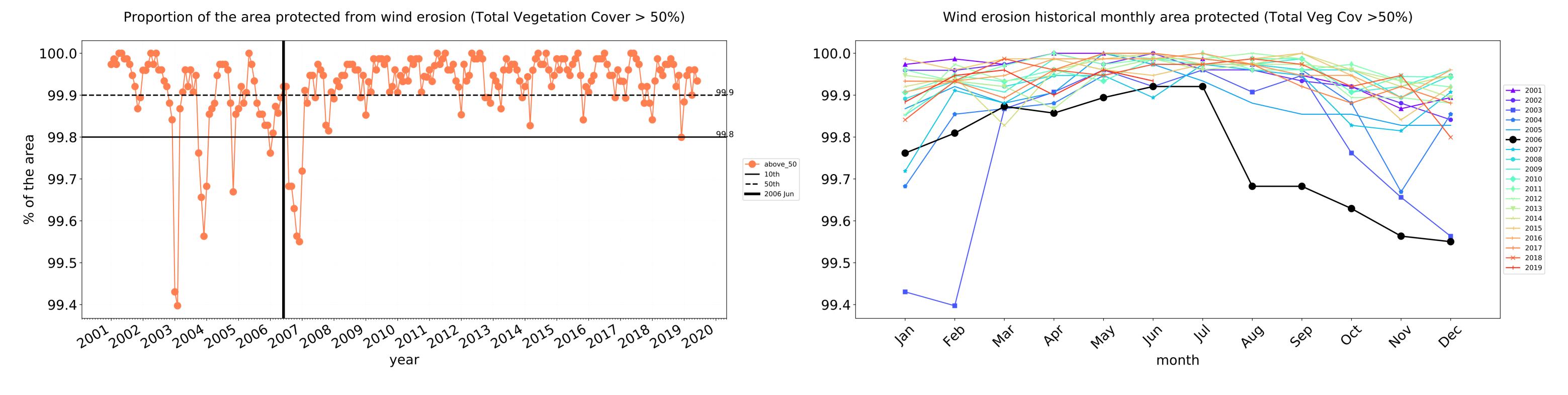


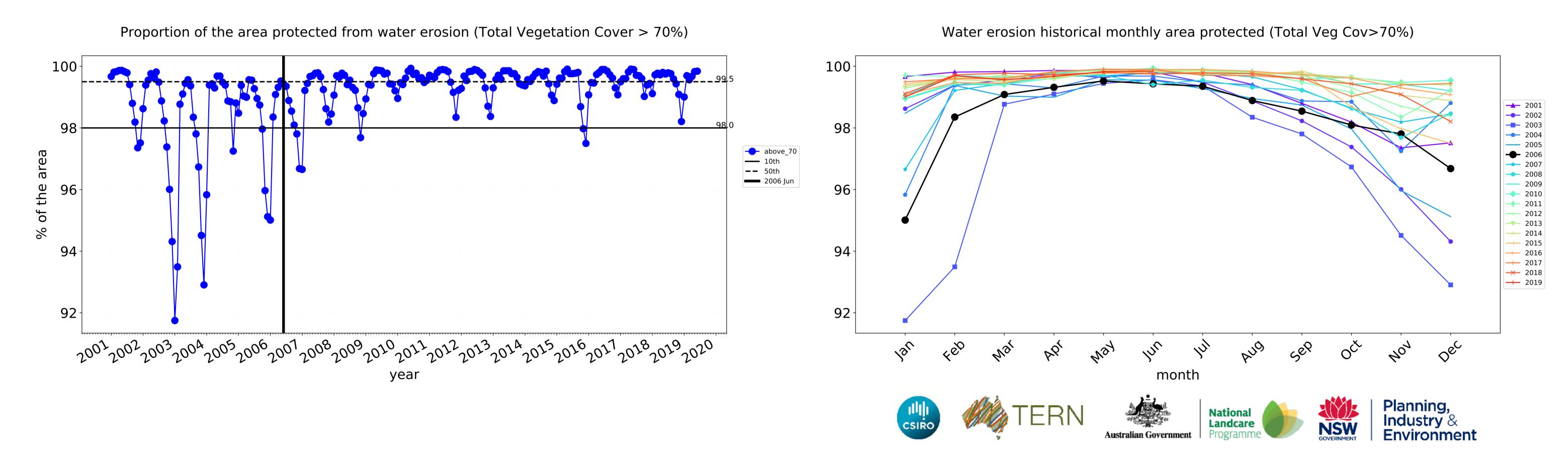


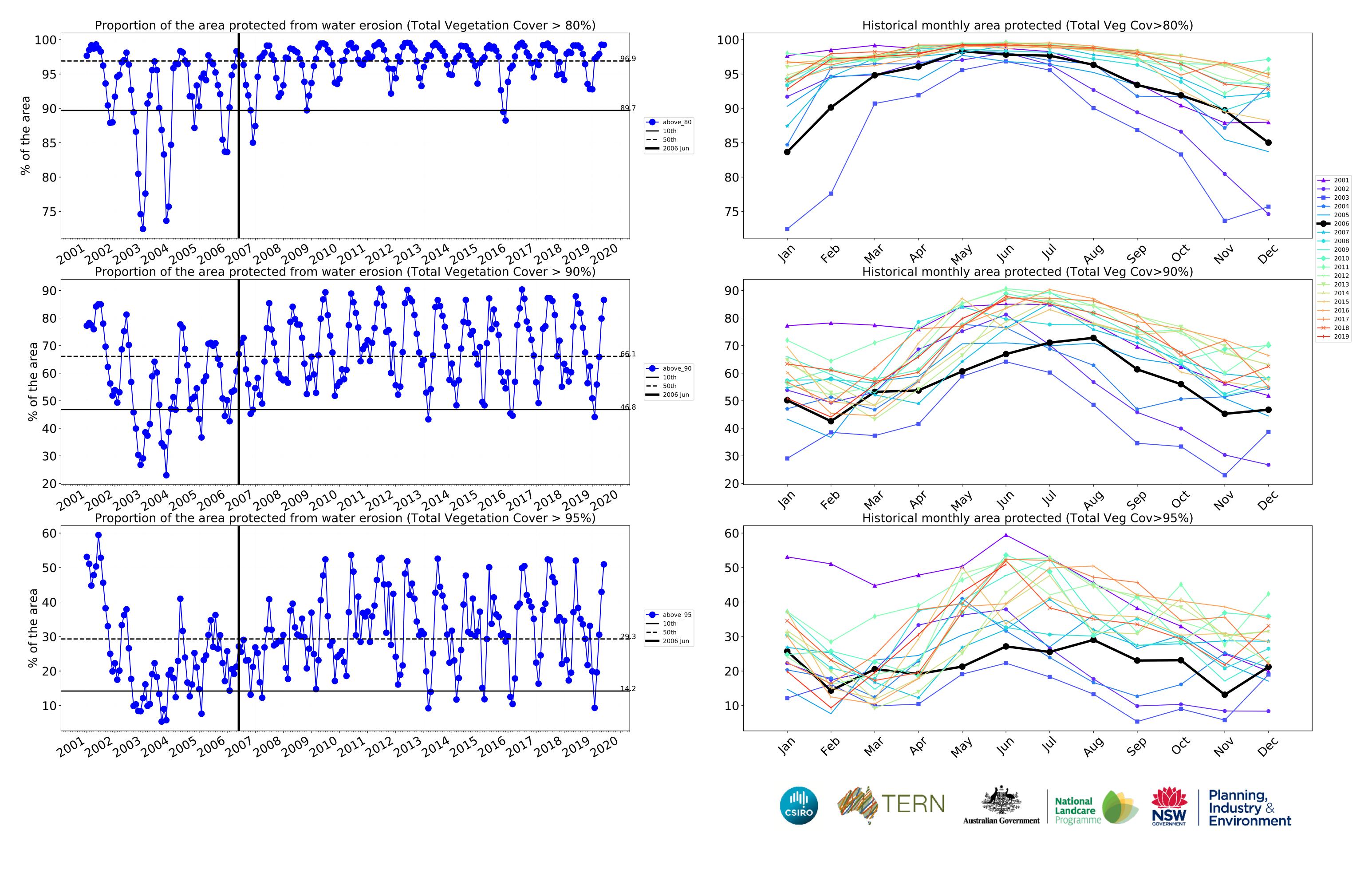




# **Grazing non forest timeseries**







# **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

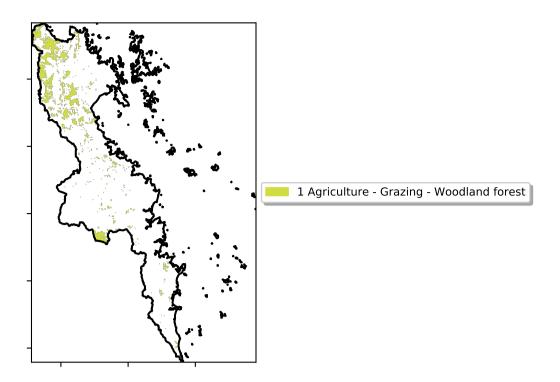
pixel is from the mean. That

pixel. The mean

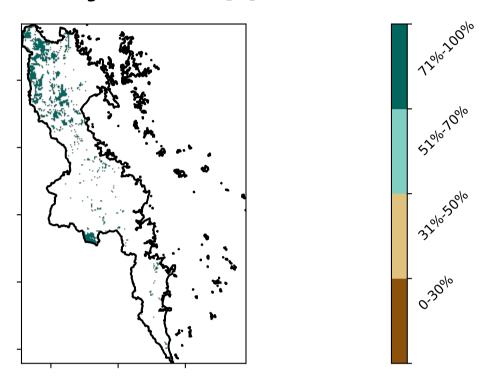
using baseline from 2001 to 2019.

is only for the month of the map

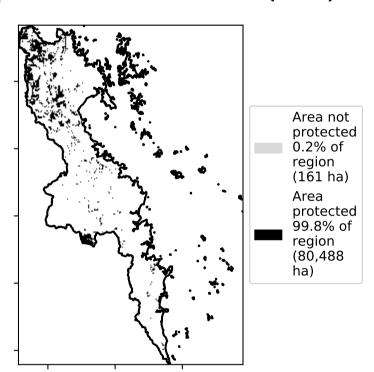
is, red pixels are about 20% lower than the mean of that



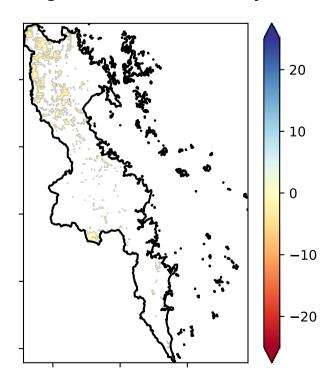
# **Total Vegetation Cover [%]**



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

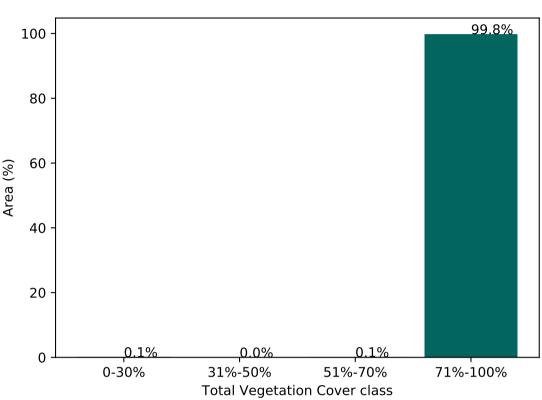


# **Total Vegetation Cover Anomaly [%]**

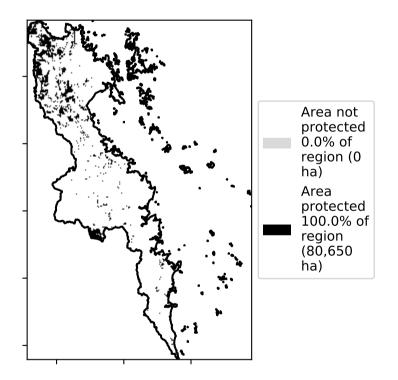


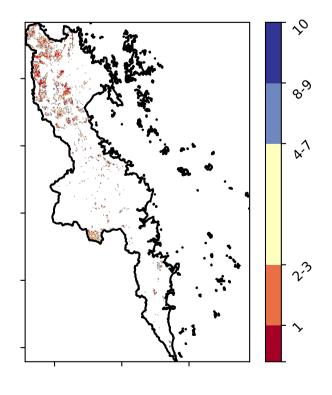
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

# Proportion of vegetation cover class in area



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









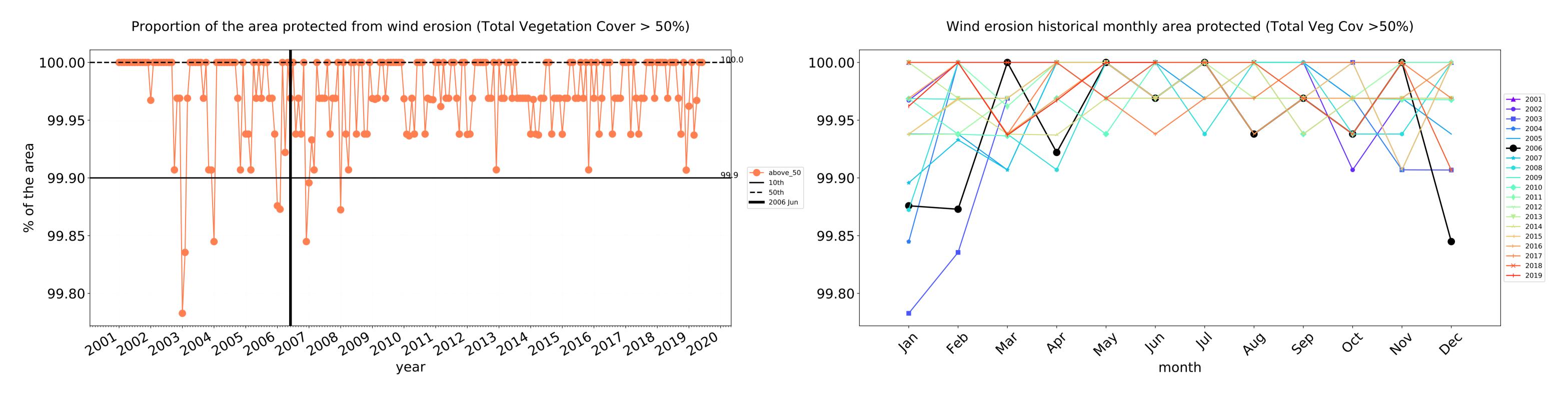


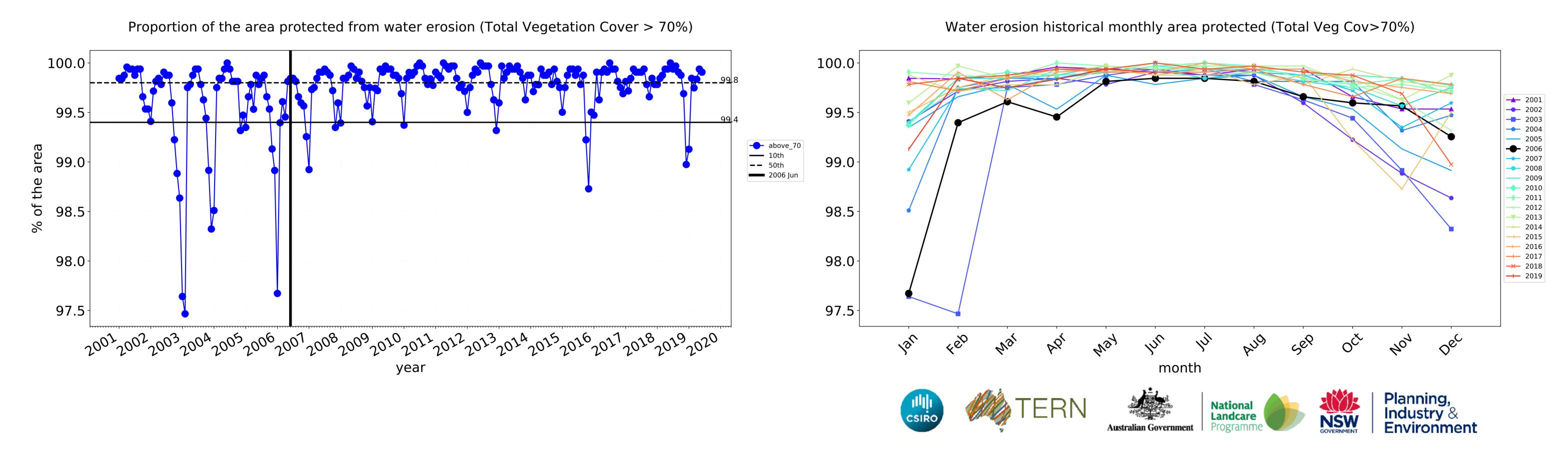


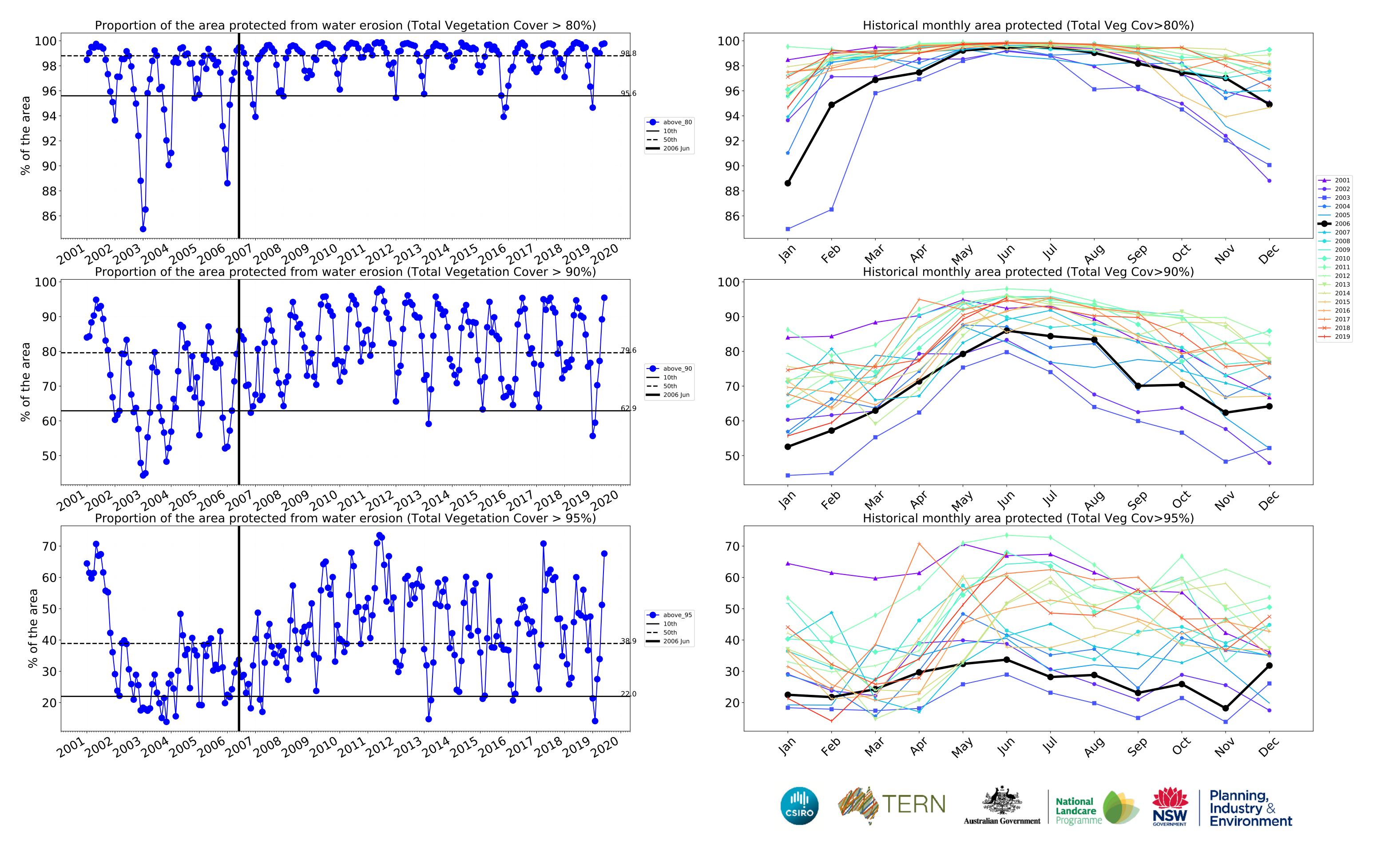




# **Grazing Woodland forest timeseries**







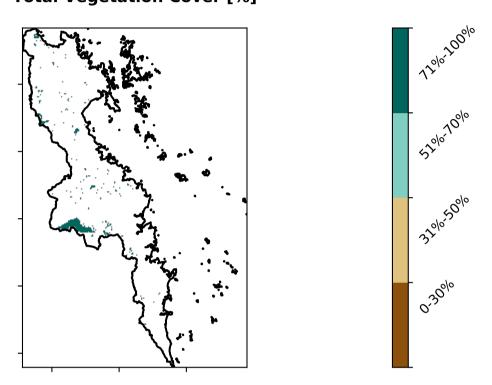
# **Grazing - Forest (non woodland)**

#### Land use and forest cover

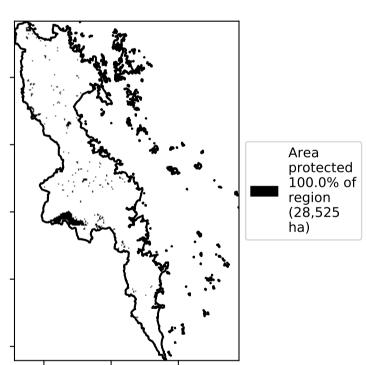
1 Agriculture - Grazing - Non-woodland forest

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

# **Total Vegetation Cover [%]**



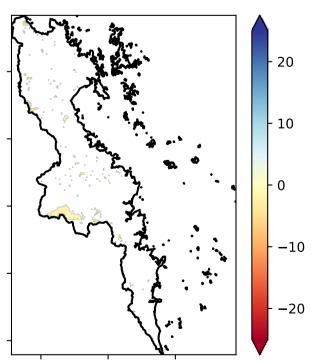
# % Area protected from water erosion (>70%)



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

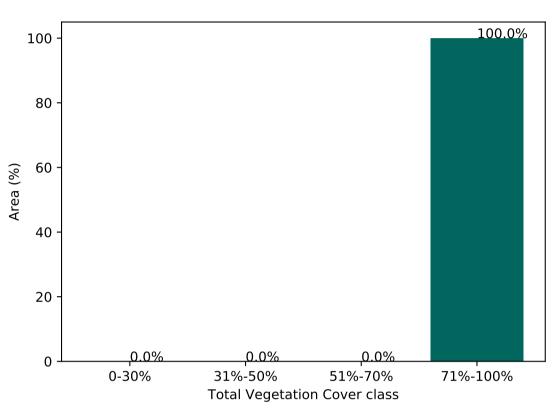
from 2001 to 2019.

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

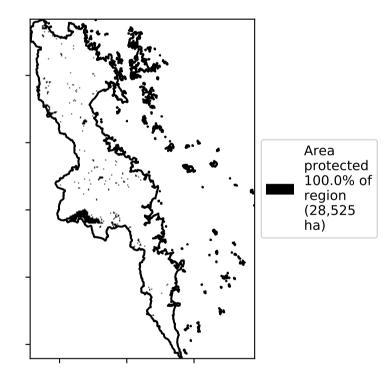


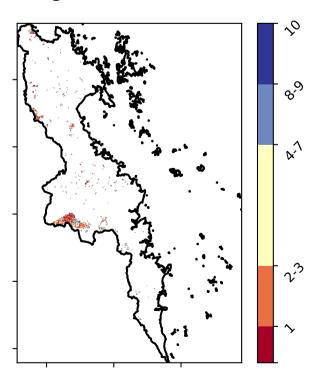
Deciles show where the pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of the map using baseline from 2001 to 2019.

# Proportion of vegetation cover class in area



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







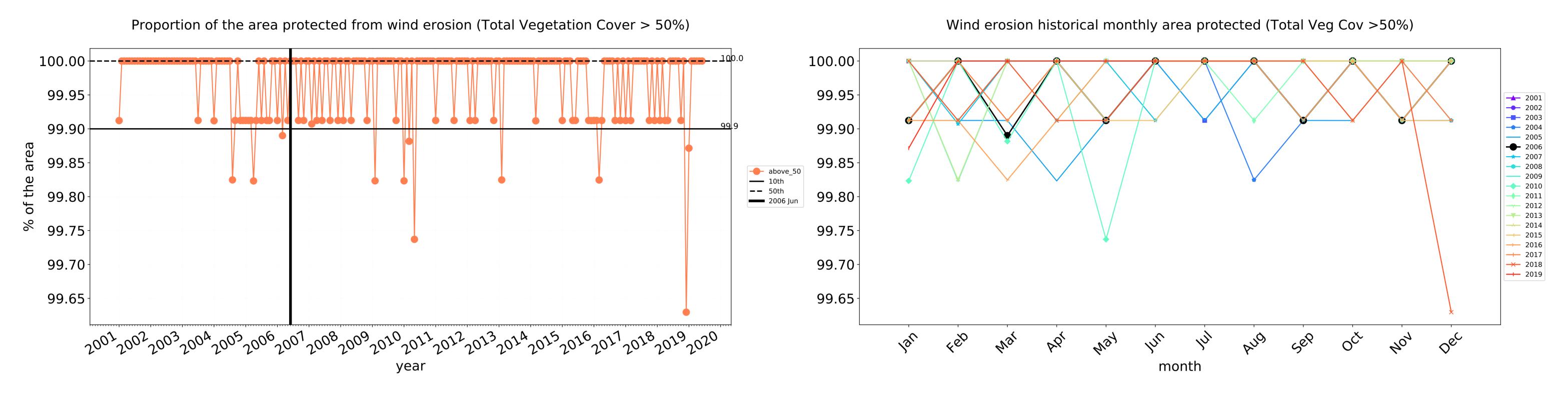


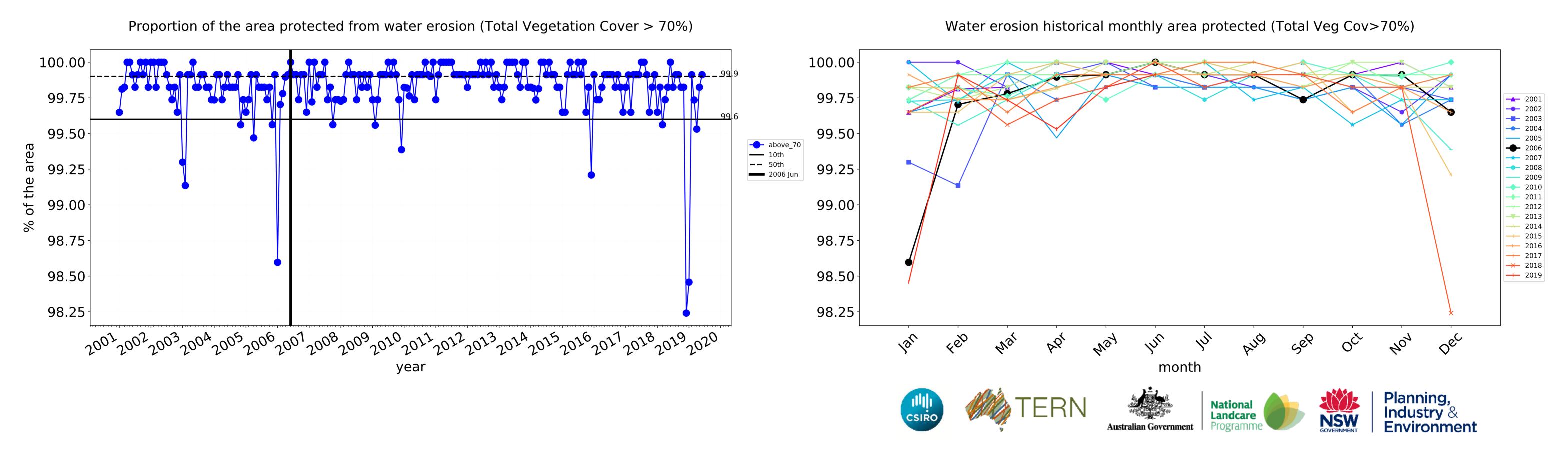


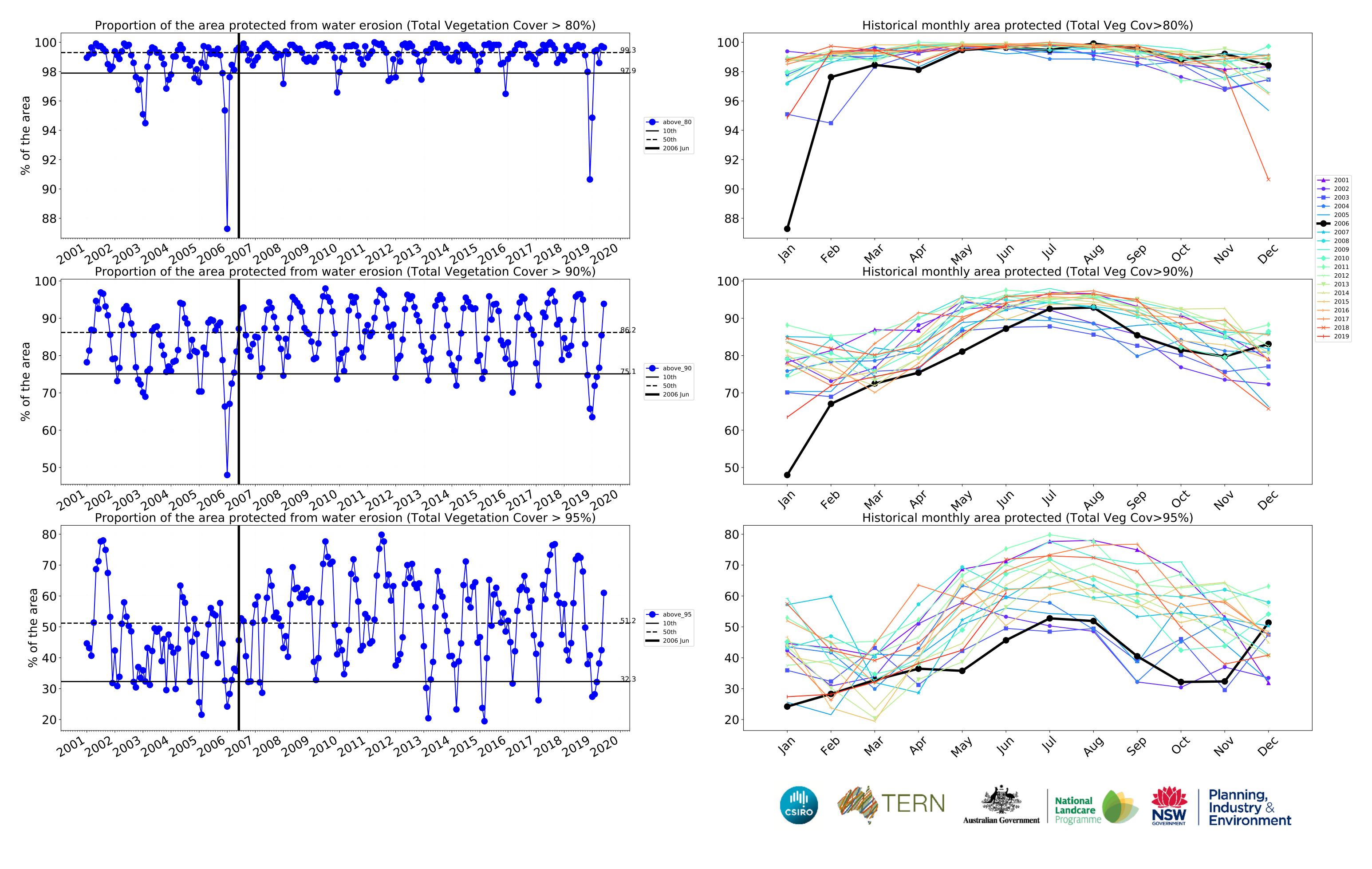












# **Irrigation**

# **Land use and forest cover**

# 1 Agriculture - Grazing - Irrigated 2 Agriculture - Cropping - Irrigated 3 Agriculture - Horticulture - Irrigated

Catchment Scale Land Use and Forests of Australia (2018)

Catchment Scale Land

Derived from

Use of Australia (2018) and Forests

of Australia (2018)

Anomaly show how many percetage points each

pixel is from the mean. That

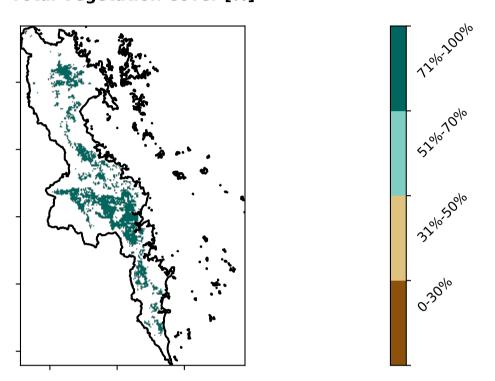
pixel. The mean

using baseline from 2001 to 2019.

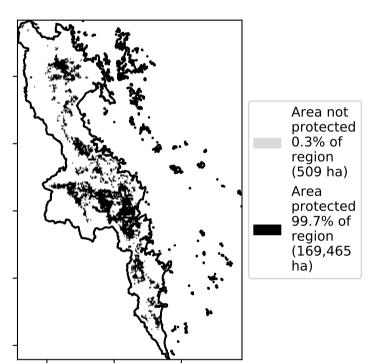
is only for the month of the map

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

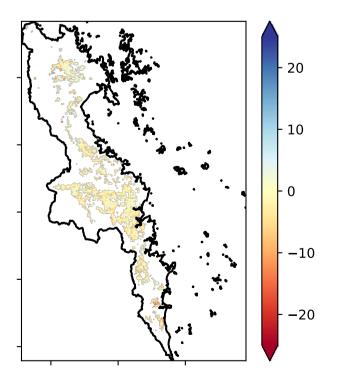
# **Total Vegetation Cover [%]**



% Area protected from water erosion (>70%)

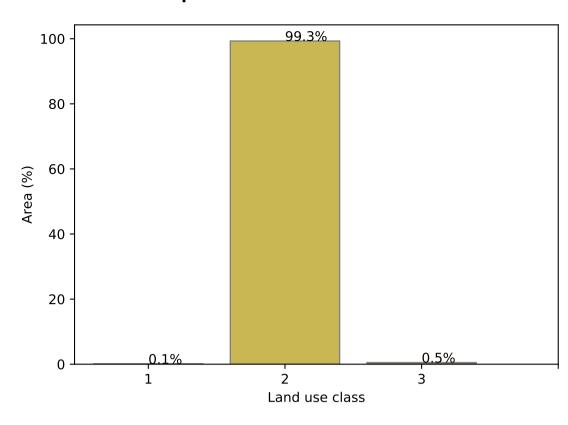


**Total Vegetation Cover Anomaly [%]** 

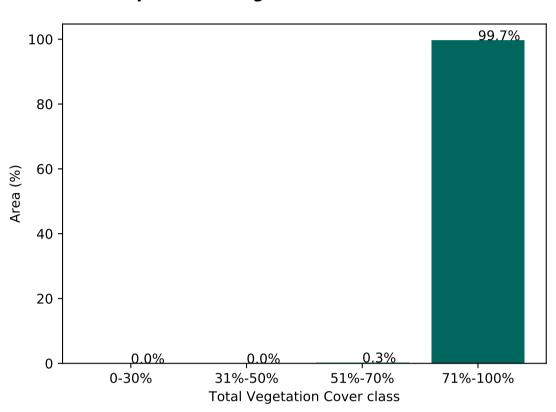


Deciles show where the pixel value lies in the in the lowest 10% of the map using baseline from 2001 to 2019.

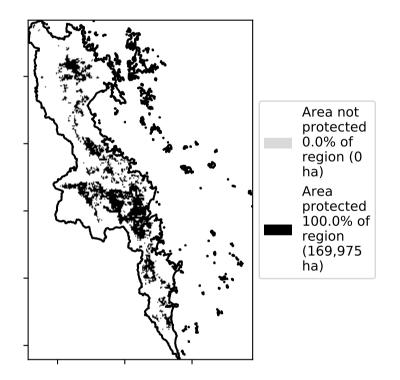
#### **Proportion of each land class in area**



Proportion of vegetation cover class in area

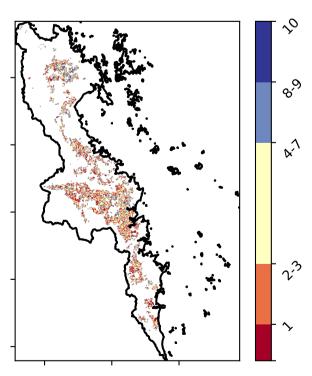


% Area protected from wind erosion (>50%)



**Total Vegetation Cover Decile [%]** 

record, from highest to lowest, for that month. That is, red pixels are records for that month of







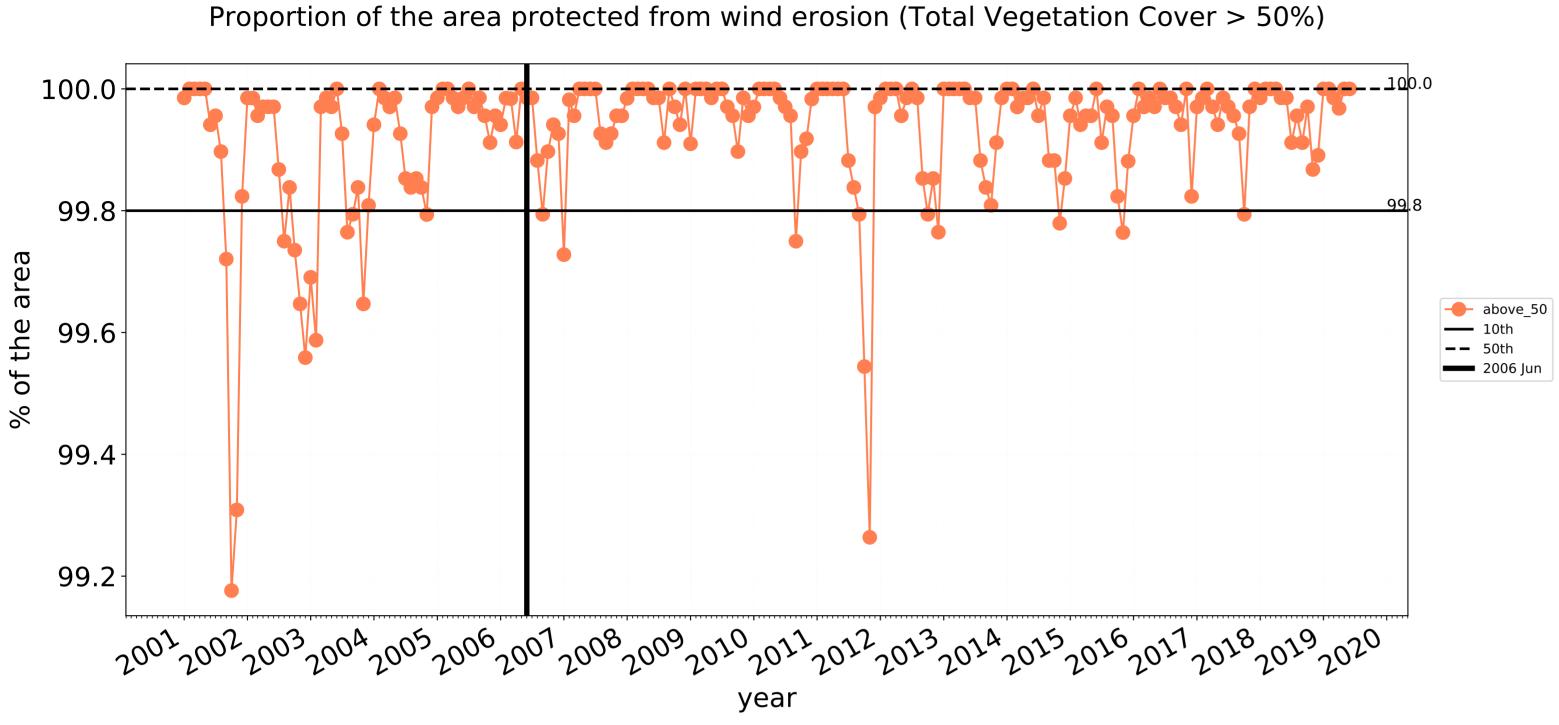


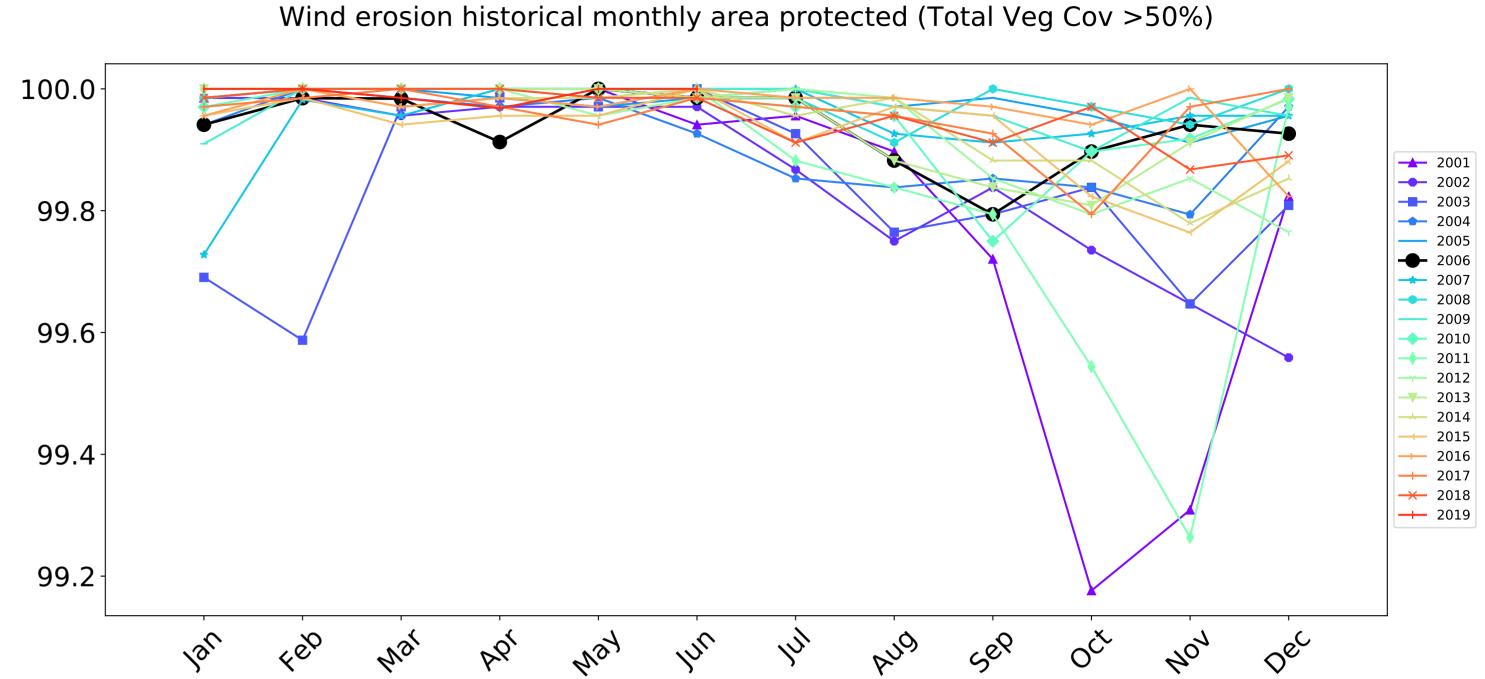




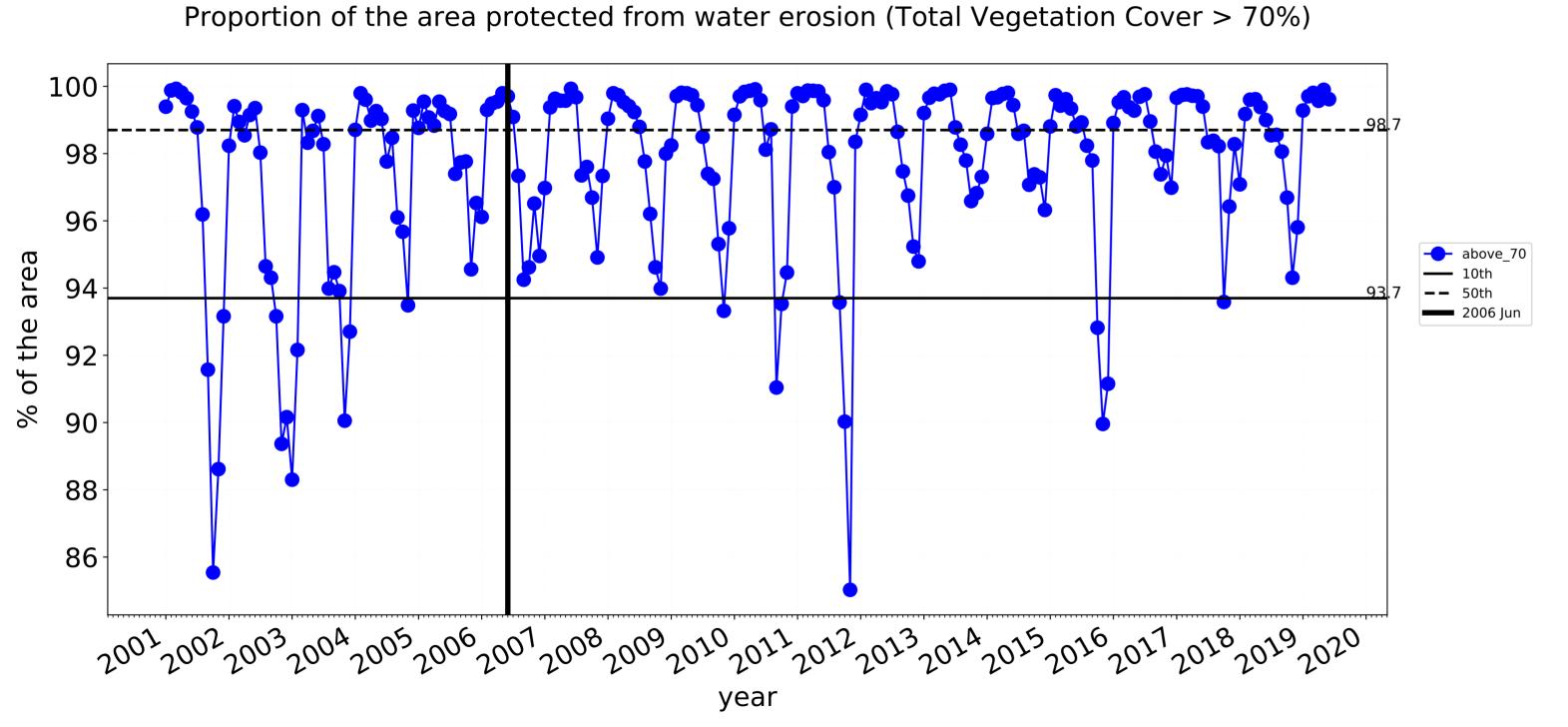


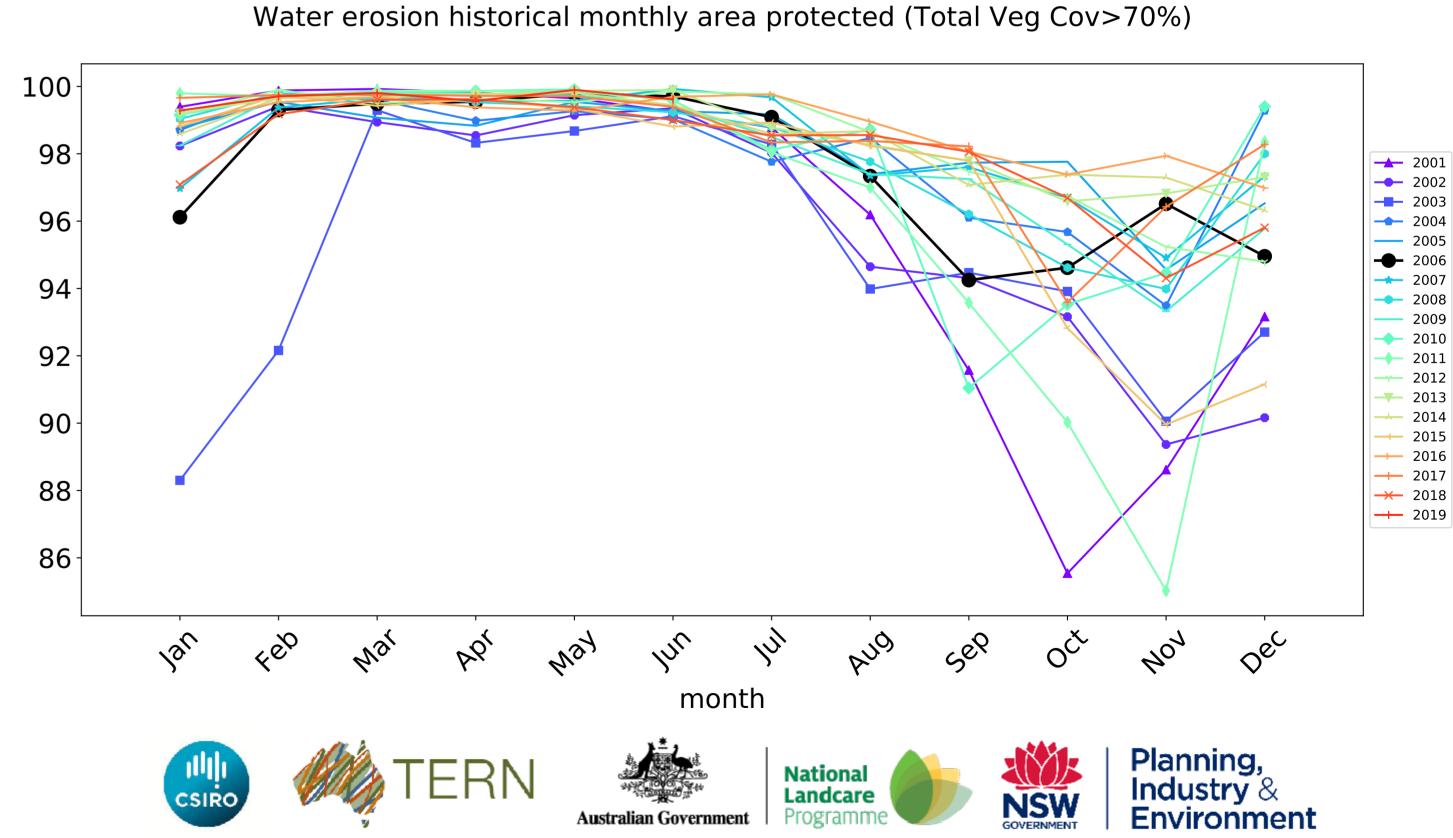
# Irrigation timeseries

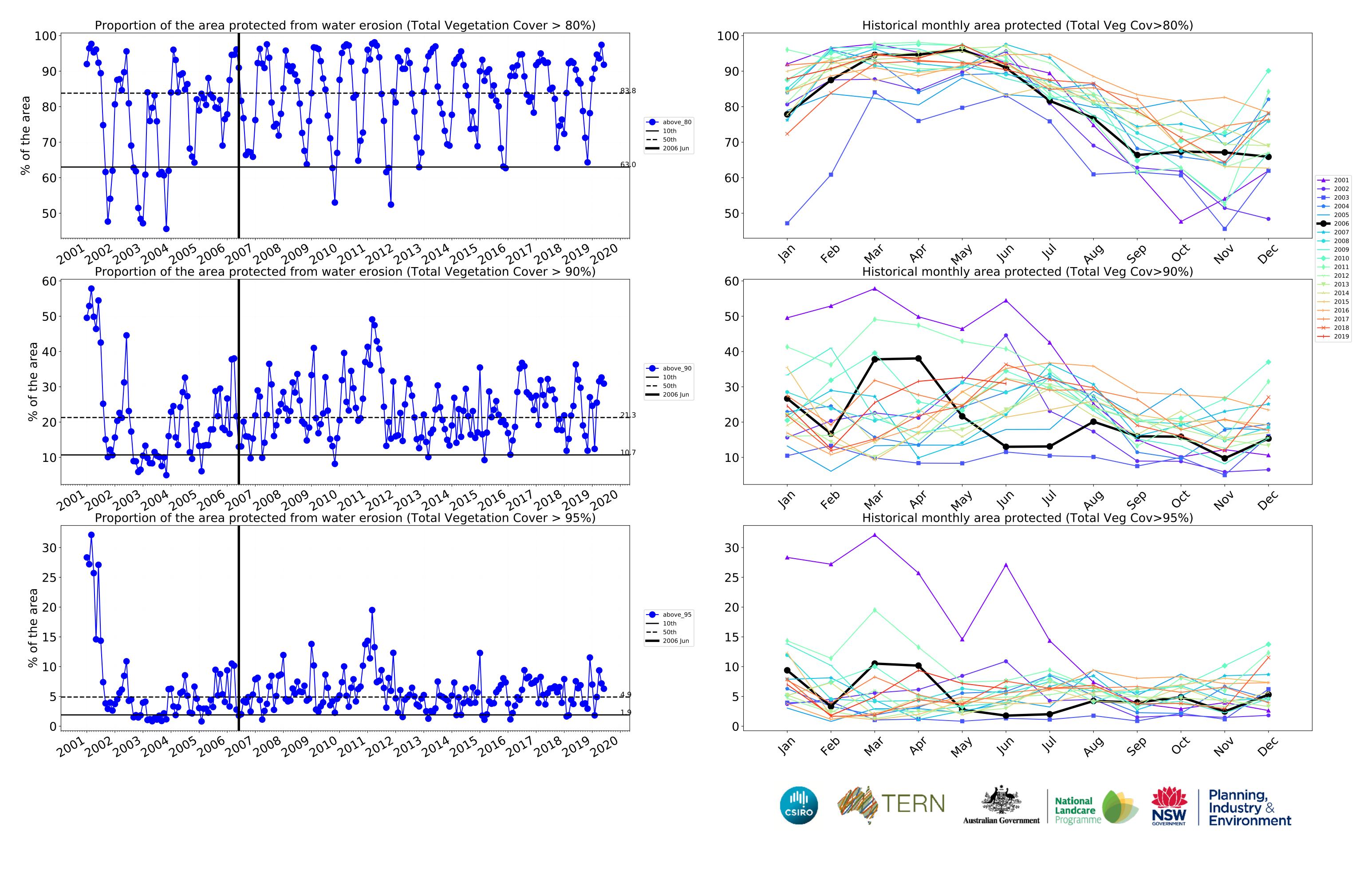




month







# **Production native forests and plantation forests**

# **Land use and forest cover**

Catchment Scale 1 Production native forests and plantation forests

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

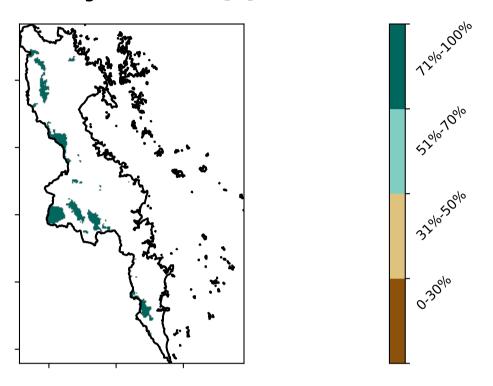
pixel. The mean

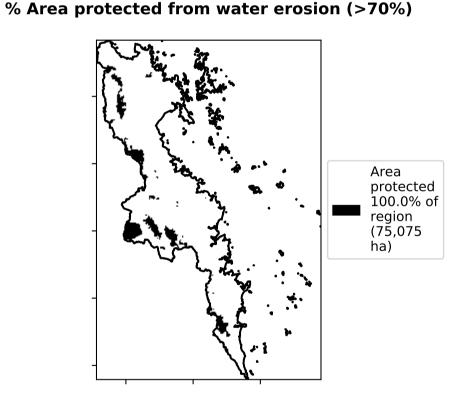
using baseline from 2001 to 2019.

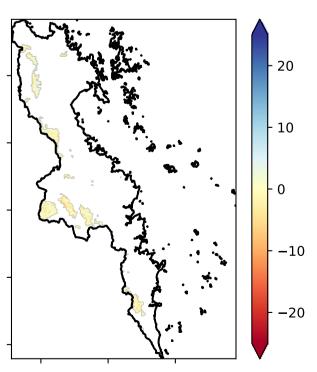
is only for the month of the map

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

# **Total Vegetation Cover [%]**

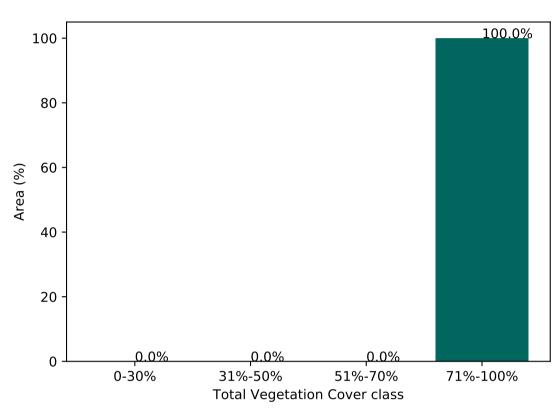




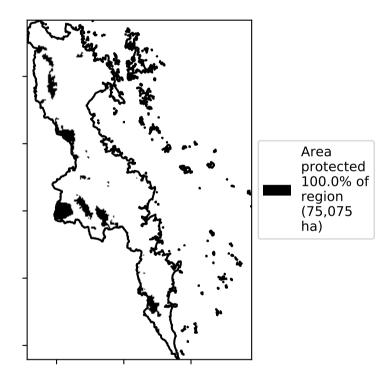


pixel value lies in the record, from highest to lowest, for that month. That is, red pixels are in the lowest 10% of records for that month of

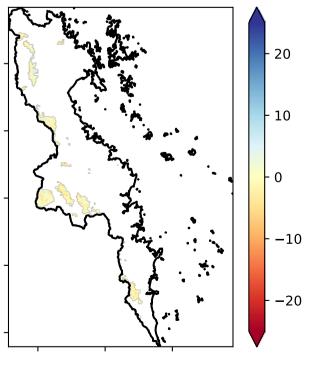
# Proportion of vegetation cover class in area



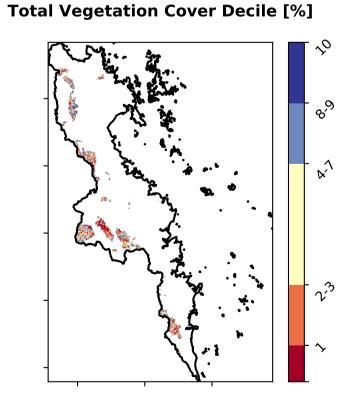
# % Area protected from wind erosion (>50%)



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



Deciles show where the the map using baseline from 2001 to 2019.







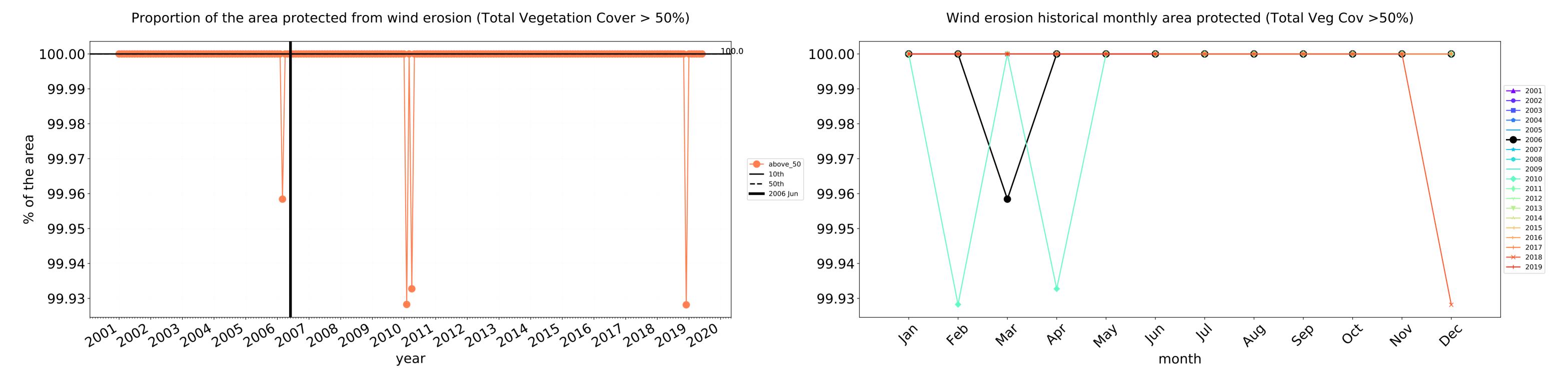


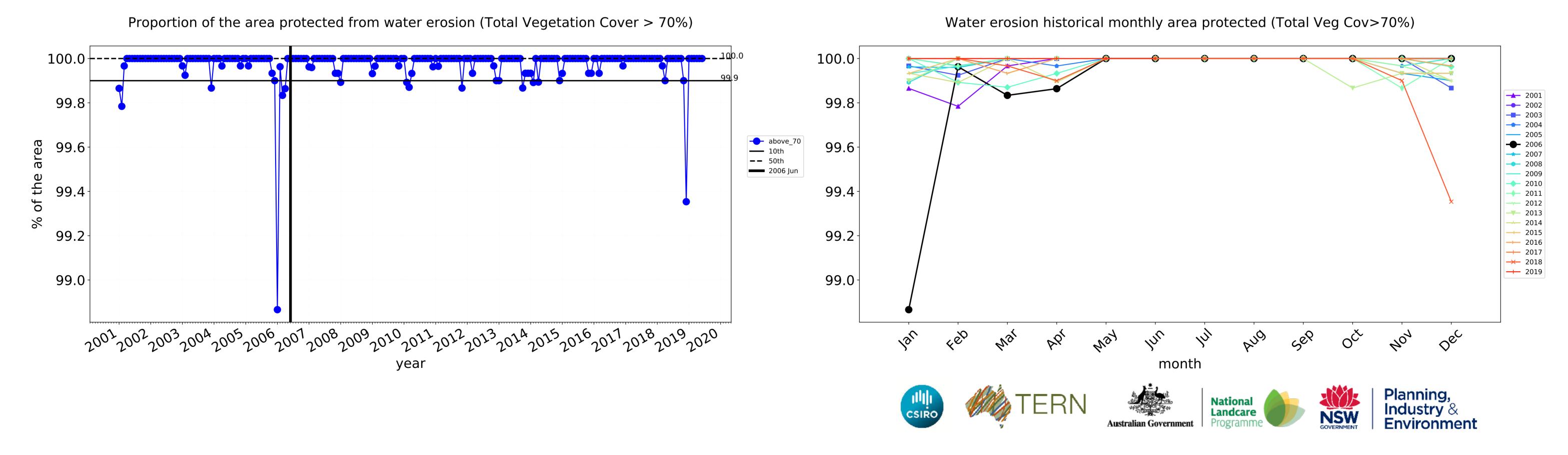


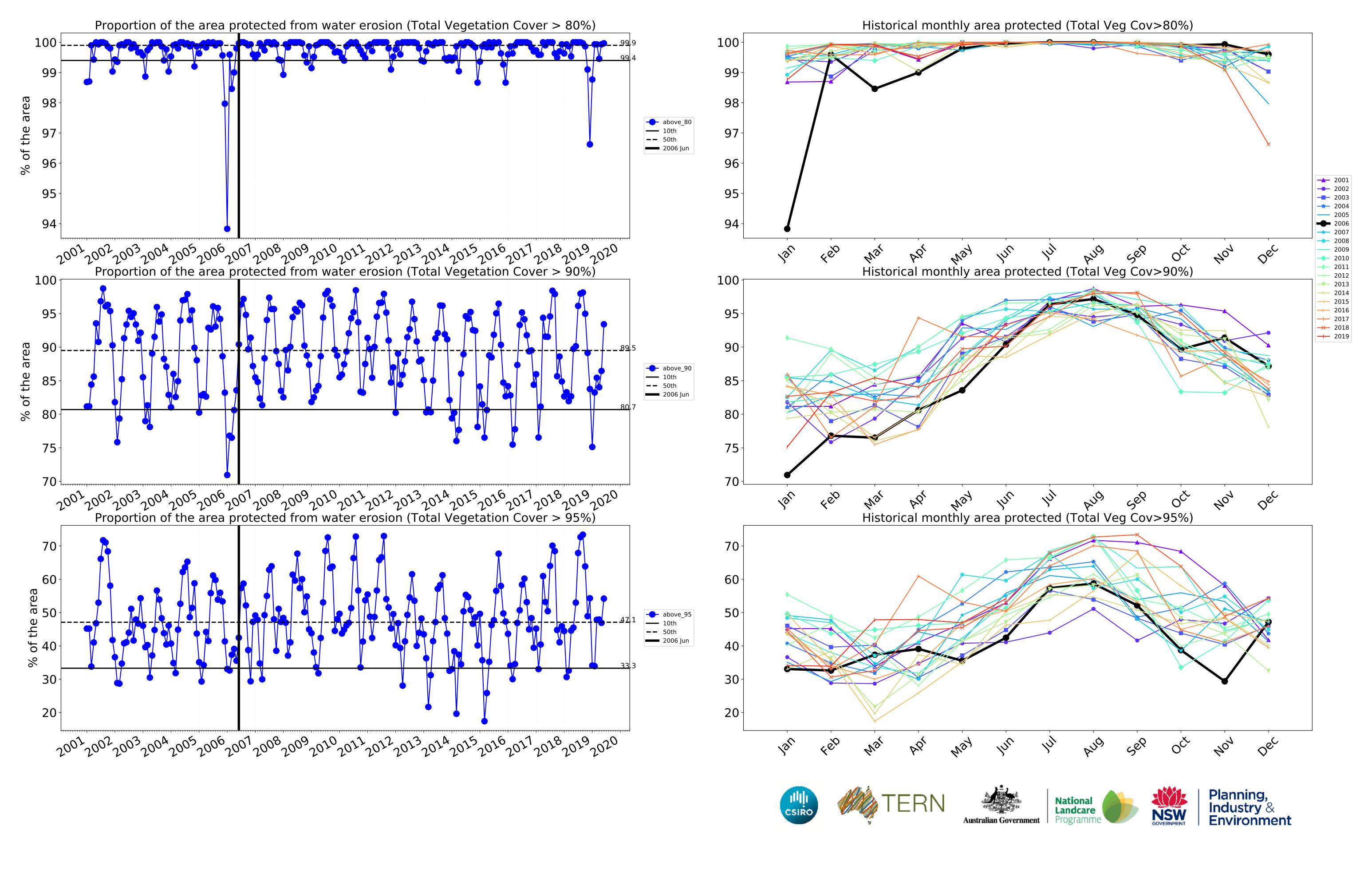




# **Production native forests and plantation forests timeseries**







# Mackay Whitsunday (907,525 ha and no data 25,535 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	907,525	99.9% 906,799	99.7% 904,924	98.7% 895,921	94.6% 858,458	60.1% 545,555	23.5% 213,545
Conservation and natural environments	274,400	99.9% 274,050	99.6% 273,225	98.7% 270,775	96.7% 265,300	74.9% 205,625	28.8% 78,975
Conservation and natural environments non forest	7,175	99.0% 7,100	96.9% 6,950	92.7% 6,650	84.3% 6,050	51.2% 3,675	22.6% 1,625
Conservation and natural environments Woodland forest	74,375	99.9% 74,325	99.7% 74,125	99.0% 73,600	97.5% 72,500	79.1% 58,825	25.8% 19,175
Conservation and natural environments Forest (non woodland)	192,850	99.9% 192,625	99.6% 192,150	98.8% 190,525	96.8% 186,750	74.2% 143,125	30.2% 58,175
Agriculture	468,250	100.0% 468,250	100.0% 468,050	99.6% 466,550	95.7% 448,275	51.9% 242,875	20.2% 94,550
Grazing	298,225	100.0% 298,225	99.9% 298,050	99.6% 297,025	98.4% 293,600	74.0% 220,725	30.7% 91,525
Grazing non forest	189,050	100.0% 189,050	99.9% 188,900	99.4% 187,975	97.8% 184,950	66.9% 126,525	27.1% 51,300
Grazing Woodland forest	80,650	100.0% 80,650	100.0% 80,625	99.8% 80,525	99.5% 80,225	86.0% 69,325	33.7% 27,200
Grazing - Forest (non woodland)	28,525	100.0% 28,525	100.0% 28,525	100.0% 28,525	99.6% 28,425	87.2% 24,875	45.7% 13,025
Irrigation	169,975	100.0% 169,975	100.0% 169,950	99.7% 169,475	91.0% 154,625	13.0% 22,100	1.8% 3,025
Production native forests and plantation forests	75,075	100.0% 75,075	100.0% 75,075	100.0% 75,075	100.0% 75,050	90.4% 67,875	42.5% 31,875











