

# VEGETATION COVER CHANGE ON DIRK HARTOG ISLAND: 2008 TO 2016

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Destocking of Dirk Hartog Island (DHI) commenced in 2008 when the majority of sheep were removed. The removal of goats commenced in 2010 and is near complete.

Changes in vegetation cover across DHI were assessed using imagery from the Landsat satellite series, captured between 1988 and 2016, photo points and nadir (downward) photos.



From the analysis of this data the influence the sheep and feral goat removal program is apparent.

## What: Site and nadir photos

Repeated site and nadir photos provide an easily interpretable record of vegetation change. For example in the photos from site 5 show significant increase in vegetation cover both in the foreground and along the face of the dunes. A slight increase in cover is evident between the 2015 and 2016 nadir photos.

At site agwa 657 the photo point and nadir photos show significant increase in vegetation cover. The nadir photos show the increase in the diameter of an acacia in one year. This is also the case for site 34, with the photo point and nadir photos showing triodia propagules extending into previously bare ground.

## When: Landsat satellite time series analysis

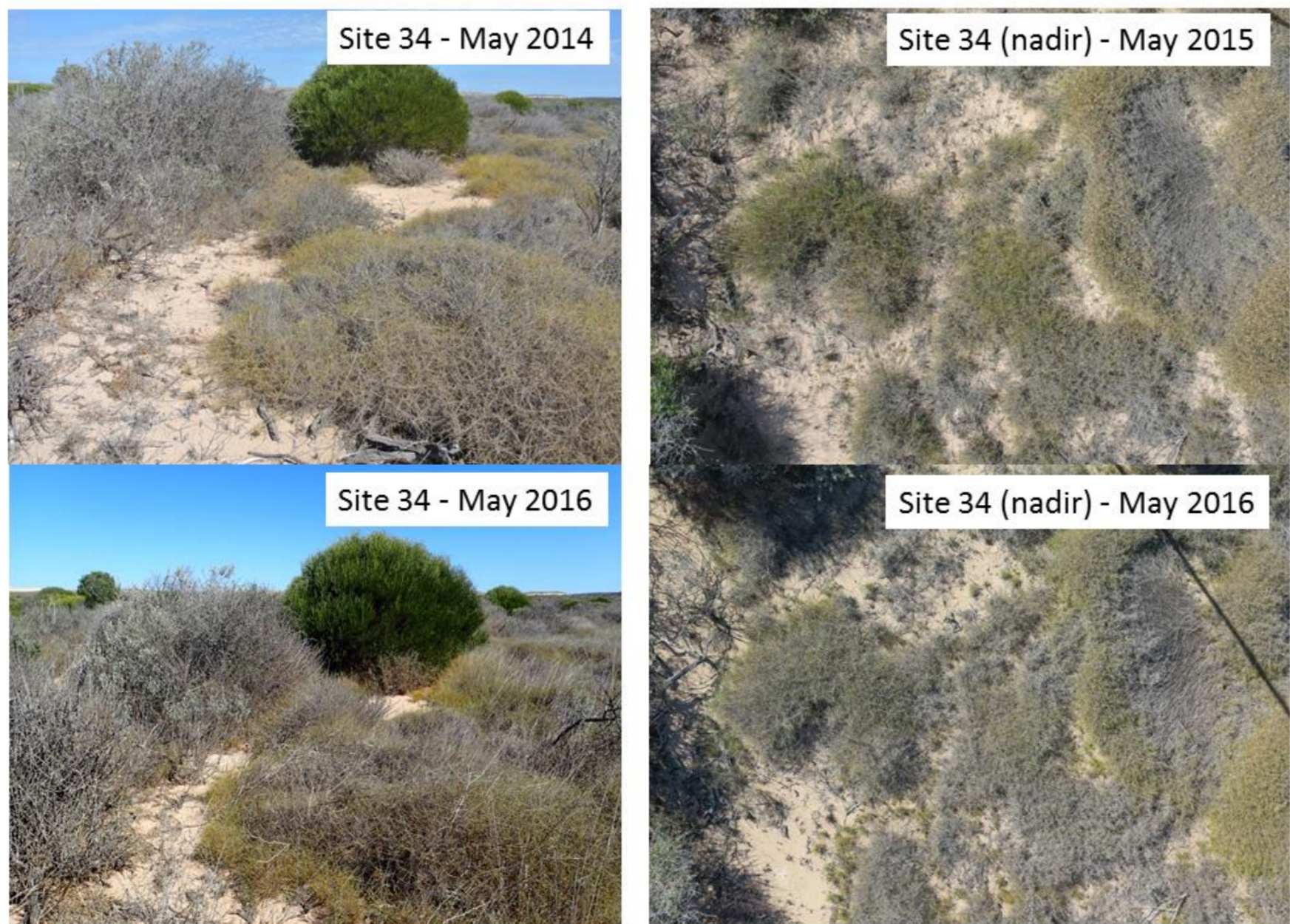
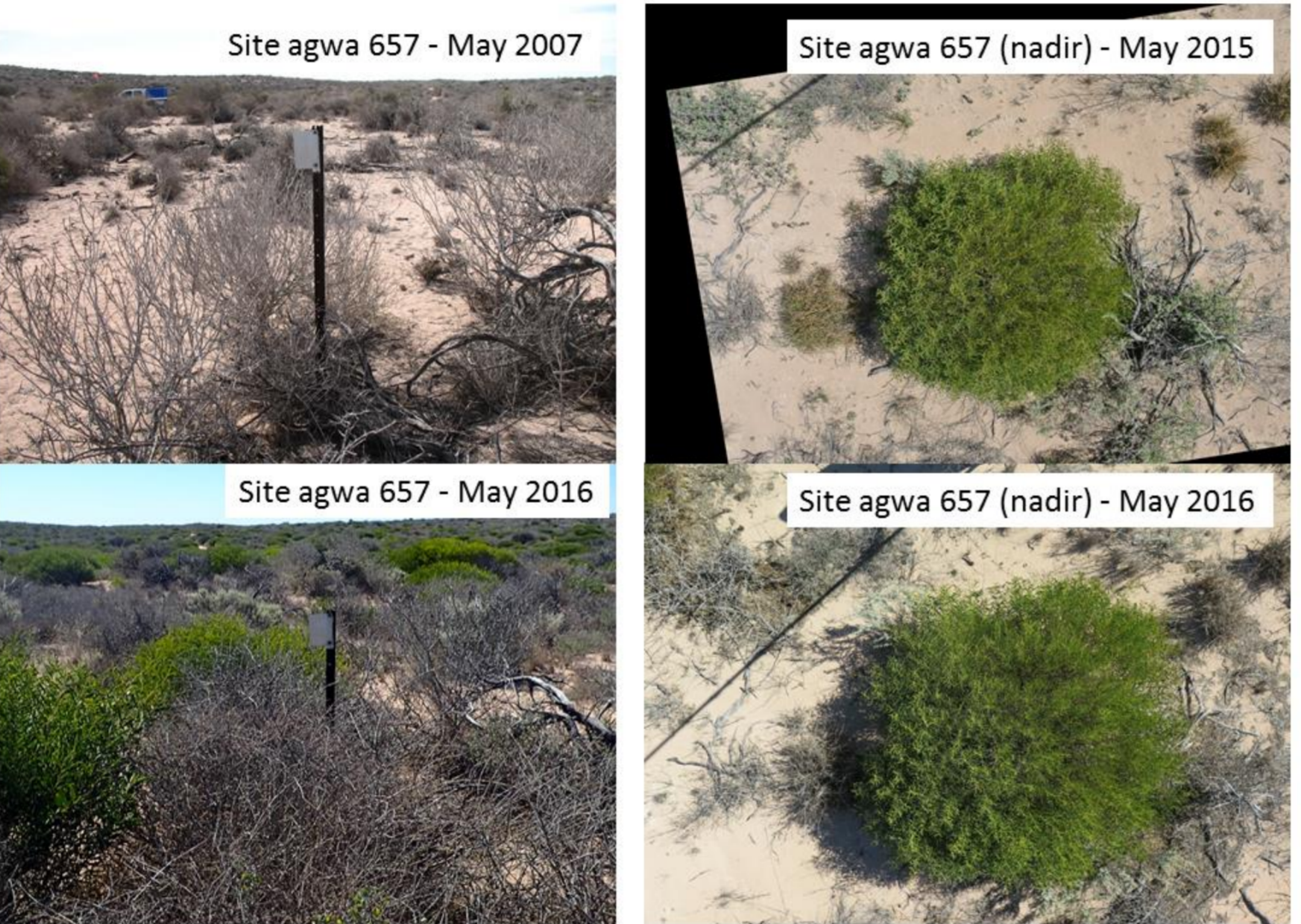
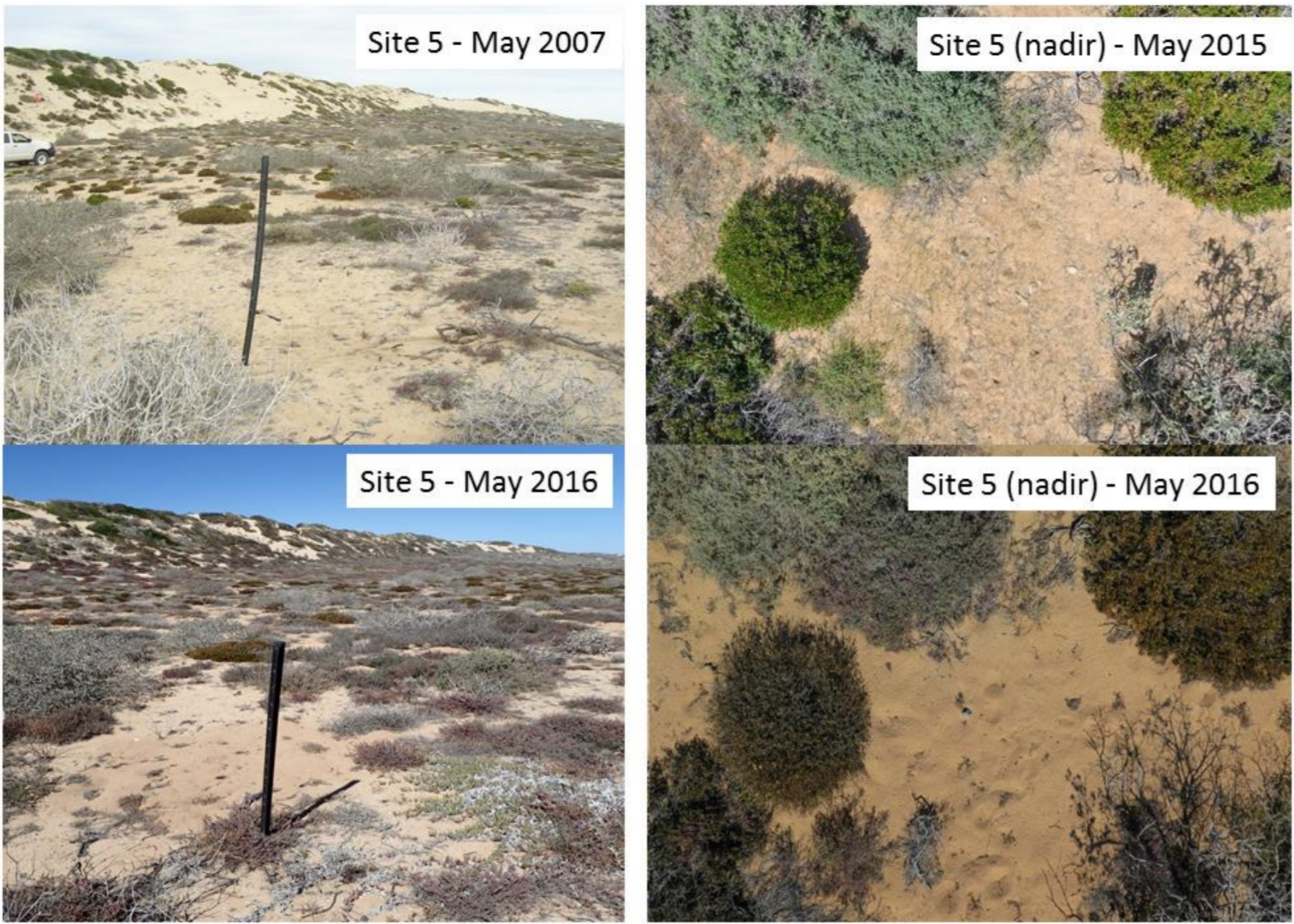
Landsat satellite imagery is used to determine if vegetation cover has increased above the pre destocking (1988 to 2008) levels or if the change being observed is part of the natural variability of the site. This is done by firstly plotting changes in cover over the pre destocking (baseline) period. A model is then fitted to this baseline (shown in red). Deviations from this baseline can then be monitored. The significance of deviations can be tested using Cumulative Sum (cusum) charts. A change is significant if the cusum value crosses the 3 standard deviation lines (blue).

In all three example sites shown here the cusum values increase above the 3 standard deviation control line. This indicates that a statistically significant increase in vegetation cover has occurred.

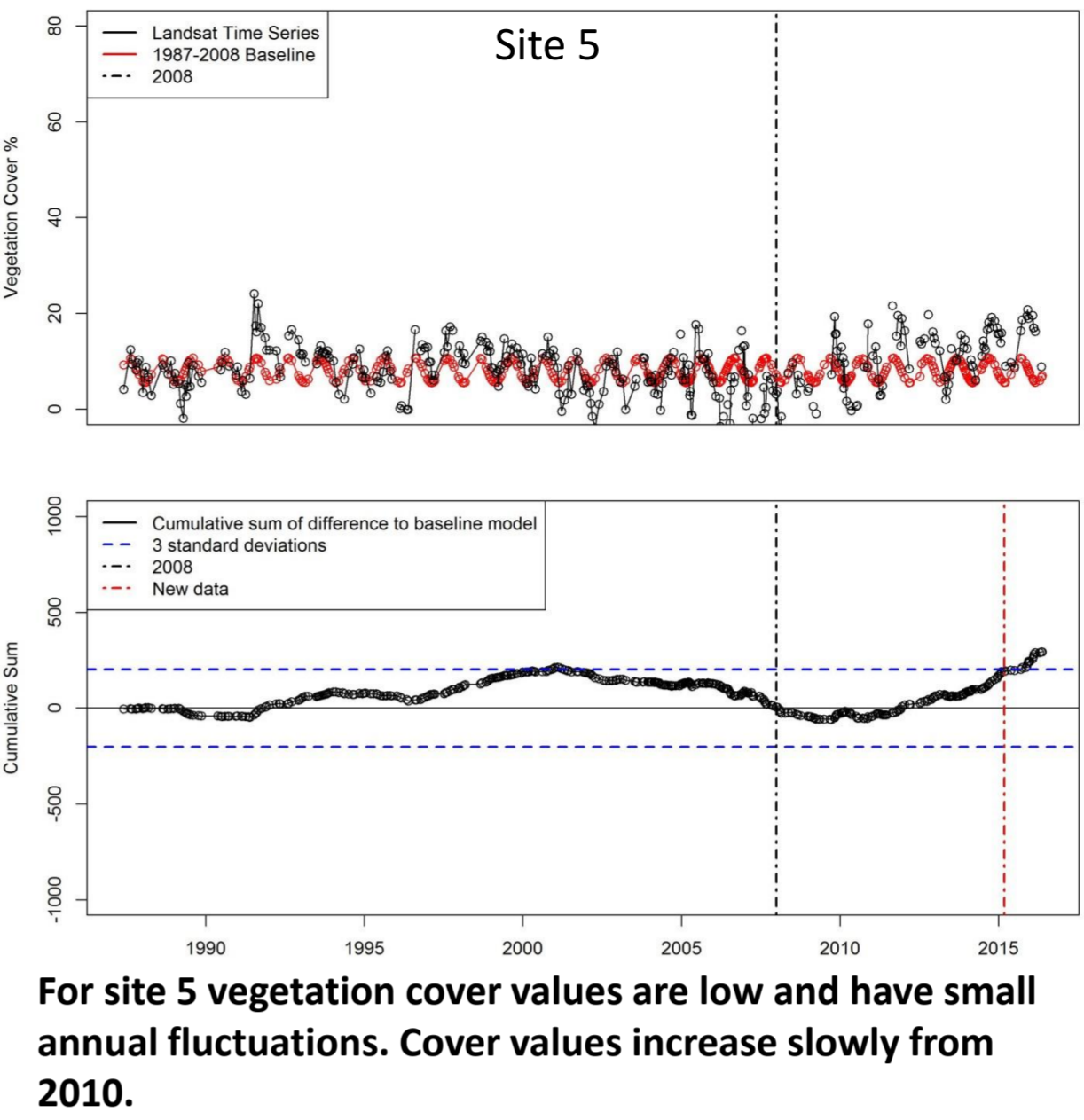
## Where: Landsat satellite cover change map

A map identifying areas of significant vegetation cover change since destocking was also created. This suggests that to 2016, 35% of DHI has experienced a significant increase in vegetation cover, this is up from 28% in 2015.

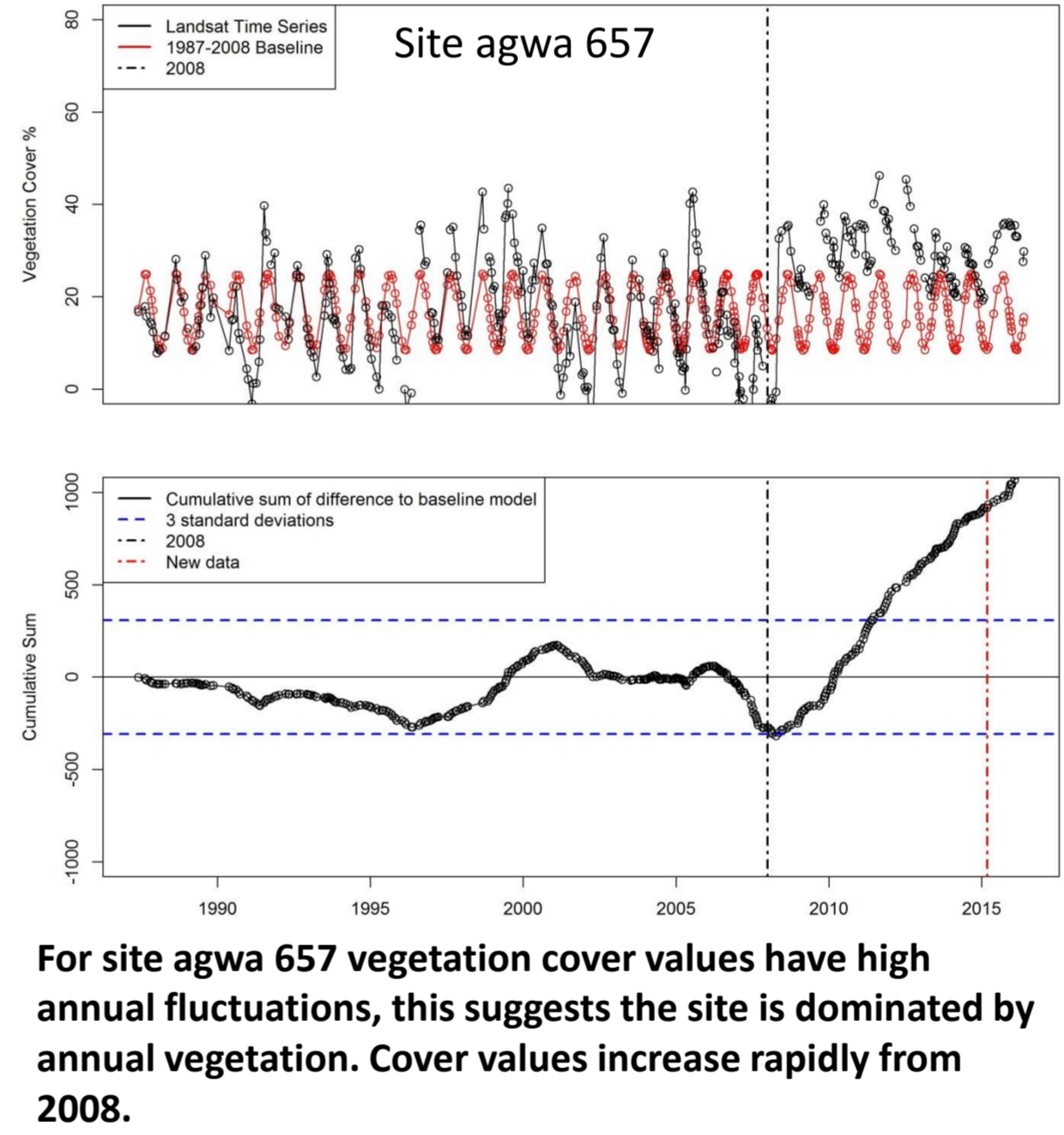
# WHAT IS CHANGING?



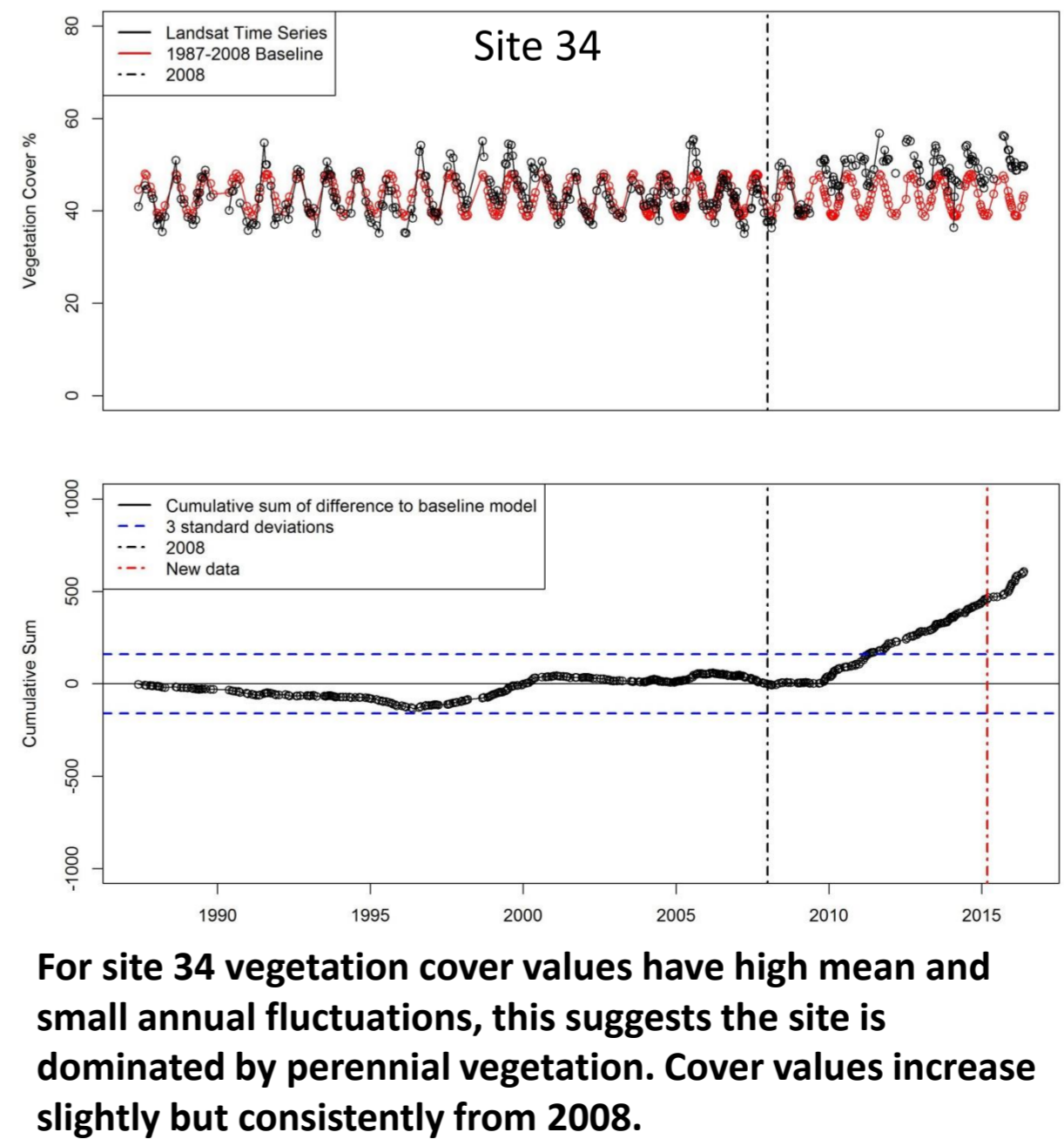
# WHEN DID IT CHANGE?



For site 5 vegetation cover values are low and have small annual fluctuations. Cover values increase slowly from 2010.

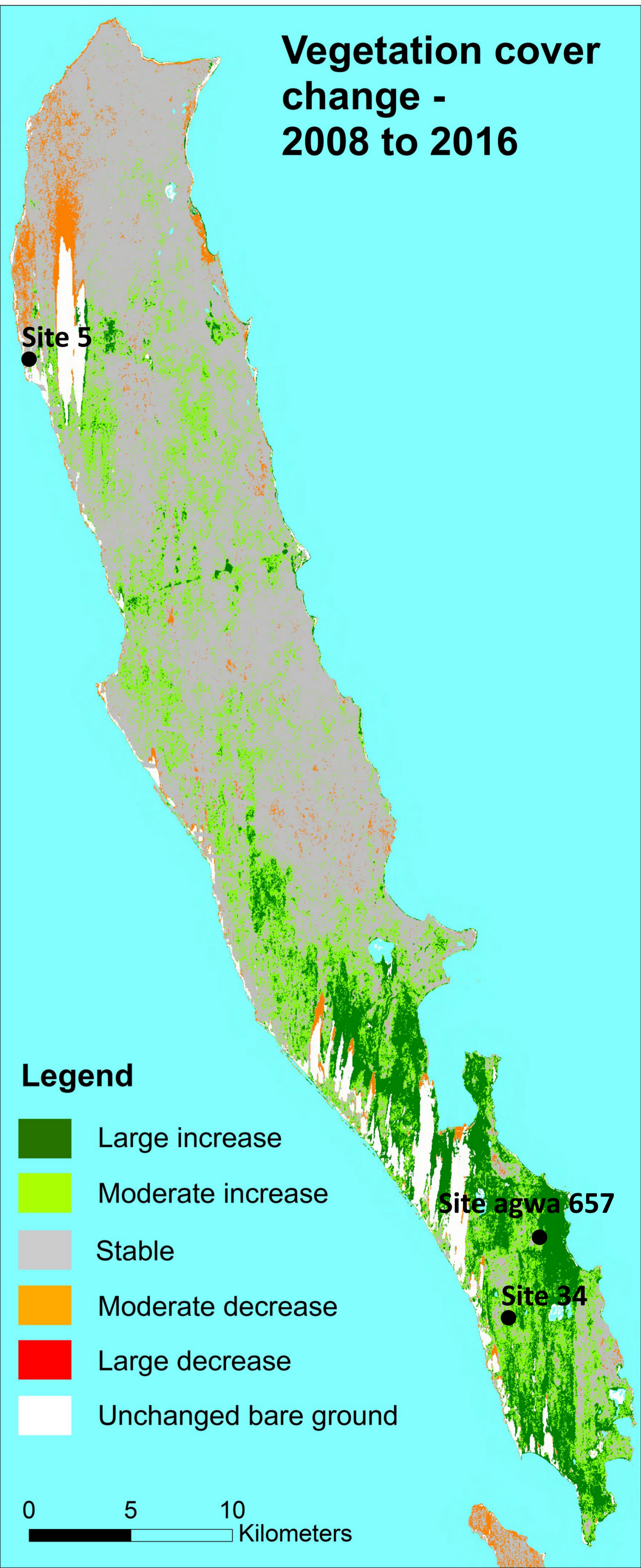


For site agwa 657 vegetation cover values have high annual fluctuations, this suggests the site is dominated by annual vegetation. Cover values increase rapidly from 2008.



For site 34 vegetation cover values have high mean and small annual fluctuations, this suggests the site is dominated by perennial vegetation. Cover values increase slightly but consistently from 2008.

# WHERE IS IT CHANGING?



- Legend**
- Large increase
  - Moderate increase
  - Stable
  - Moderate decrease
  - Large decrease
  - Unchanged bare ground