

# The VegMachine® Guide

(July 2016)

VegMachine is a tool for summarising long term, spatial and temporal changes in land cover from decades of satellite imagery. It allows you to select areas of interest, and generate simple reports and analyses of how those areas are changing over time.

The satellite imagery used in VegMachine is currently produced by the Remote Sensing Centre in the Queensland Department of Science, Information Technology and Innovation, using the Landsat image archive. Landsat commenced earth observation in 1986. Landsat imagery has been developed into multiple products used in VegMachine, including Fractional Cover and Ground Cover.

VegMachine should work on most web connected devices running a Chrome or Firefox browser. Performance may vary in other browsers. This manual is written for larger screen devices. It is still relevant to smaller devices but users should be aware that programming will rearrange the main screen layout to optimise screen space.

Please note that in this document italicised print indicates text that should be visible on the screen.

## 1. Starting VegMachine

When you open the VegMachine website you will see that the window is shadowed by the *Data Collection* popup (Figure 1). You will need to click the *OK* button to use the site.

Once you enter the website, you'll see that the main page has three main panels (Figure 2);

- the menu bar,
- the *Map Panel*, and,
- the *Output Panel*.

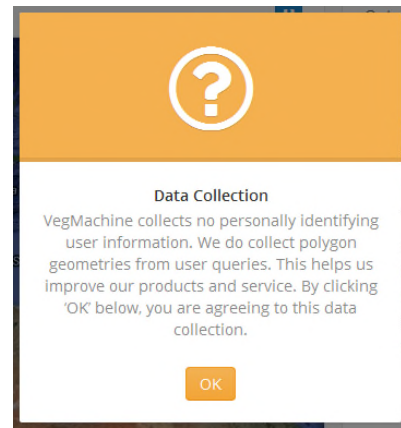


Figure 1. Data collection popup.

These are described below, but operate much as you would expect. The menu (Section 2) is used to drive most of VegMachine's functionality, the *Map Panel* (Section 3) is where you view images and draw or import your line work (such as paddock and property boundaries), and the *Output Panel* (Section 4) is where you will see graphs generated from your analyses.

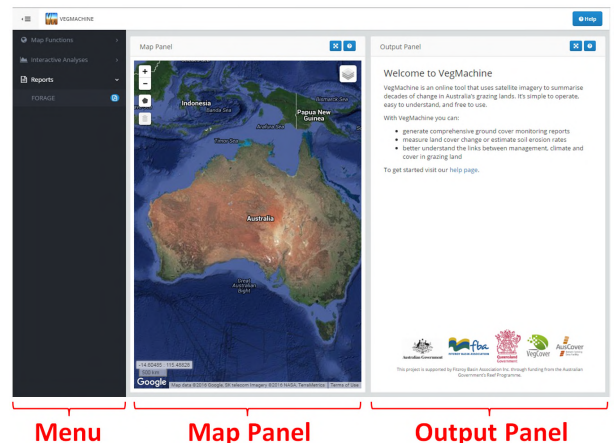
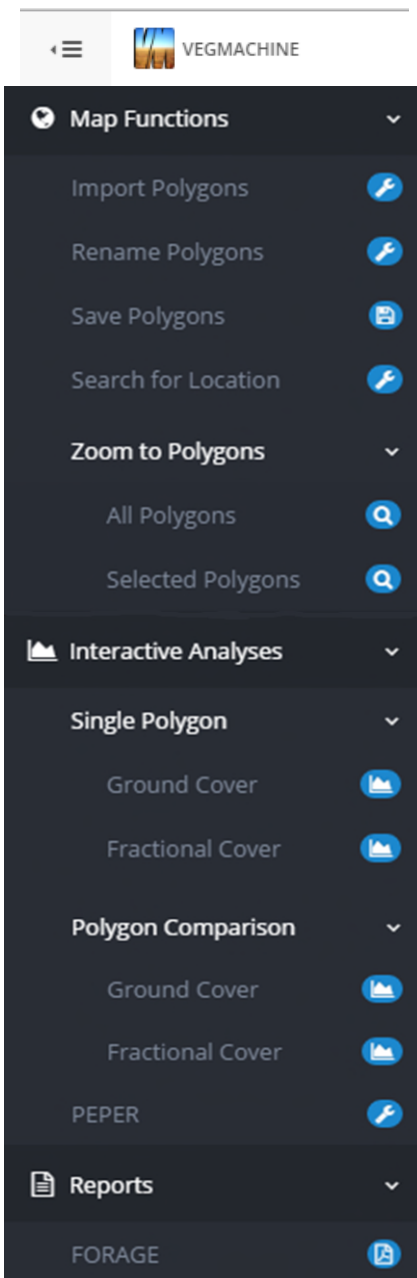


Figure 2. VegMachine website with three major panels highlighted.

## 2. The menu panel

The menu panel includes three main tabs; *Map Functions*, *Interactive Analyses* and *Reports*. Figure 3 shows the fully expanded menu panel including all sub-tabs. These are explained below in the order they appear on the menu panel.



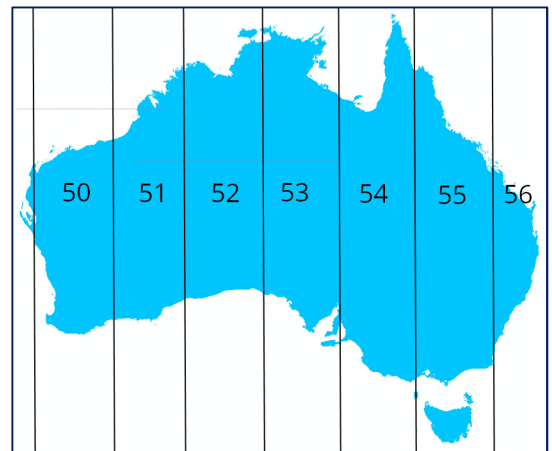
**Figure 3.** Expanded menu panel.

### 2.1 Map Functions > Import Polygons

This tool imports existing digital polygon mapping (e.g. paddocks on a grazing property). A variety of formats are permitted (shp, KMZ, GeoJSON). Multipart files like shapes must be zipped in a single file for upload.

1. Click *Map Functions > Import Polygons*.
2. The *Import Polygons* popup will open.
3. In the *Polygon File* box, click *Browse* button, then find your polygon file and add it here.
4. In the *Coordinate System* box you can select the appropriate option from the drop down menu. In most cases, the default value (*Default (as defined in*

*file*)) will suffice. If not, you will need to select from the other options. Figure 4 shows the distribution of UTM zones across Australia if your coordinate system is UTM based.



**Figure 4.** UTM zones of Australia.

5. In the *Label Field* box enter the name of the attribute in your data that stores the polygon names.
  - For kmz files, *Name* is often, but not always, the correct text.
  - For GeoJSON files previously saved in VegMachine (2.4), the correct text entry is *VMId*.
  - For shape files, the shape zip will include a dbf file. Open the dbf in Excel, and the correct text will be the title of the column containing the paddock names.
  - If none of the above work, you can leave the *Label Field* blank and add paddock names later (2.3).
6. Click the upload button and your polygons should appear in the *Map Panel*. If they don't plot at the right location, you have used the wrong coordinate system, so delete the imported polygons (3.3) and reimport them using the correct coordinate system at step 4.

### 2.2 Map Functions > Rename Polygons

This tool can rename any polygons in the *Map Panel* regardless of whether they are imported (2.2) or drawn (3.2).

1. Zoom to the polygon(s) you wish to rename.
2. Click inside the polygon you want to rename. It will change from white once selected.

3. Click *Map Functions > Rename Polygons*. This will open the *Rename Selected Polygons* popup.
4. Enter the new name for your polygon in the *New Name* box then click *Rename*.
5. The popup will close and now when the cursor hovers over the renamed polygon, the new name will be visible. You can rename multiple polygons in one process by selecting multiple polygons at step 2.
6. If you want to use the renamed polygons with their new names at a later date, you will need to save them to your device (2.4).

### **2.3 Map Functions > Save Polygons**

This tool saves all polygons currently in the *Map Panel* to a directory on your device. Saved polygons can be imported (2.2), or drawn (3.2). Polygons are saved whether selected or not, along with their selection setting, so those selected and unselected at the time of saving will remain so when you open the saved polygon file.

1. Click *Map Functions > Save Polygons*. The polygons should save to your default downloads folder as *polygons.geojson*. If you already have a downloaded file with this name, it will be named *polygons (2).geojson*, or similar.
2. If you want, you can use your computer's file manager to move this file to a more suitable location, or to rename it (though keep its *GeoJSON* extension).

### **2.4 Map Functions > Search for Location**

This allows basic location search similar to Google mapping.

1. Click *Map Functions > Search for Location*. This will open the *Search for Location* popup.
2. Type the location into the text window. This text can include ton or locality, street name and number and postcode.
3. Click *Search*. The *Map Panel* will reset with the selected location at the centre of the panel if it is listed in the search database.

### **2.5 Map Functions > Zoom to Polygons**

This tool includes two options. *All Polygons* adjusts the *Map Panel* so that all mapped polygons are within the panel extent. *Selected Polygons* adjusts the

*Map Panel* so that all selected polygons are within the panel extent.

### **2.6 Interactive Analyses > Single Polygon**

This tool measures land cover in a single user specified polygon. It offers *Ground Cover* and *Fractional Cover* options (see section 5 for more information on which of these options best suits your needs).

1. Select at least one polygon from those plotted in the *Map Panel* by clicking the polygon (once selected it will display clear). If more than one polygon is selected, VegMachine treats the group as a single polygon and returns an analysis for the combined group.
2. Click *Interactive Analyses > Single Polygon* then either *Fractional Cover* or *Ground Cover*. The screen will white out while your request processes, then the *Output Panel* will display your results.
3. You can export the raw graph data or an image of the graph using the tools on the upper right of the *Output Panel* (4.1). See 6.1 for how to interpret this analysis.

### **2.7 Interactive Analyses > Polygon Comparison**

This tool compares land cover between two user selected polygons. It offers *Ground Cover* and *Fractional Cover* options (see section 5 for more information on which of these options best suits your needs).

1. Select two polygons to compare from those plotted in the *Map Panel*. You select polygons by clicking on them (once selected they will display clear).
2. Click *Interactive Analyses > Polygon Comparison* then either *Fractional Cover* or *Ground Cover*. The screen will white out while your request processes, then the *Output Panel* will display your results.
3. You can export the raw graph data or an image of the graph using the tools on the upper right of the *Output Panel* (4.1). See 6.2 for how to interpret this analysis.

### **2.8 Interactive Analyses > PEPER**

PEPER uses the Universal Soil Loss Equation to model the amount of sediment lost from a user specified

site under three different cover scenarios (the *Total Cover* component of *Fractional Cover* is the cover value used in all scenarios).

- *Historical*: assuming the long term historical cover levels on the site.
- *Target*: assuming long term median cover on the site equal to a user specified target value.
- *Regional*: assuming long term median cover on the site equal to the median cover value for the surrounding region.

The results of the analysis are delivered as a graph and as a spreadsheet (csv) file that can be read in Microsoft Excel.

1. Select a polygon you want analysed in the PEPER report. You can select more than one polygon, but PEPER will treat them as a single object, and **results for groups of polygons that are widely separated will be unreliable**.
2. Click *Interactive Analyses > PEPER*. This will open the *PEPER Report* popup.
3. Select a *Regional Buffer (Km)* distance. This defines the region around your site, for which PEPER will calculate median regional cover for the *Regional* scenario. The region extends outward from the site boundary for the selected distance.
4. Select a *Target Cover (%)* value for the *Target* scenario. This is the target cover level for your polygon.
5. Click *Submit*. The screen will white out while your request processes, then the *Output Panel* will display the *PEPER Analysis* graph. This shows the modelled tons/hectare/year of sediment exported from the polygon under each cover scenario.
6. You can export the raw graph data or an image of the graph using the tools on the upper right of the *Output Panel* (4.1). See 6.3 for how to interpret PEPER analyses.

## 2.9 Reports > FORAGE

*FORAGE* provides multi-polygon analysis of *Ground Cover* change, such as a paddock-by-paddock analysis of cover for a grazing property. If you have digital mapping of your property, it is the fastest way to generate a comprehensive ground cover monitoring

report for your property. The report is delivered in pdf format, via email.

1. Plot your polygon(s) in the *Map Panel*. You can draw them in the *Map Panel* (3.2) and /or import them (2.2).
2. Select all polygons you want to include in the *FORAGE* report by clicking on each so that it displays clear.
3. Click *Reports > FORAGE*. This will open the *Forage Reports* popup.
4. Leave *Report Type* as is.
5. Enter the *Email* address that will receive the report.
6. Add up to 20 characters of text in the *Label* box (e.g. property name). This will be inserted in the header of the report as part of the label.
7. Click the *Submit* button. The screen will white out while your request is processed.
8. A *Report Requested* popup will open advising that your request has been sent. Click *OK* to shut the popup, and wait for your emailed report. Waiting time is normally about 10 minutes. You can continue to use VegMachine while you are waiting for your *FORAGE* report.
9. Be sure to read the help materials included in the report. These are the primary materials to help you interpret your report.

## 3. The Map Panel

The *Map Panel* is where spatial information is presented and where you can interact with the mapping. There are a number of features and tools in this window, located in each corner of the panel (Figure 5). These are explained below.

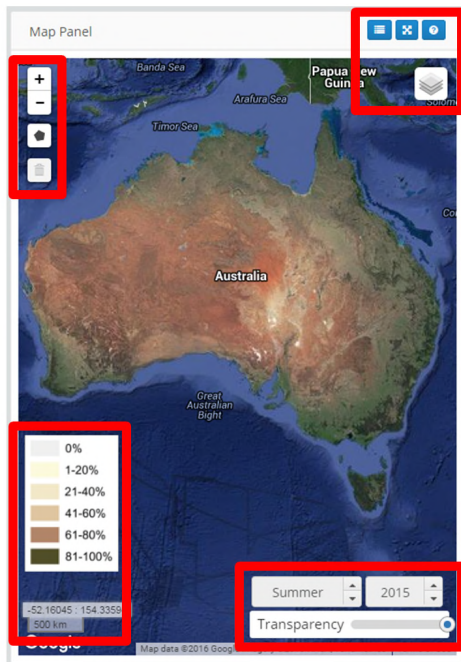
### 3.1 Zoom in / Zoom out (Figure 6A)

Click the + and – buttons to alter the *Map Panel* extent. If you are using a mouse, you can also zoom using the scroll wheel while the cursor is over the *Map Panel*.

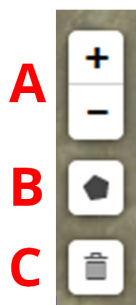
### 3.2 Draw a polygon (Figure 6B)

This tool allows you to draw polygons in the *Map Panel*. Polygons are the closed shapes like paddock

boundaries. You cannot draw points or lines in VegMachine.



**Figure 5.** Tools and features are found in each corner of the *Map Panel*.



**Figure 6.** Upper left *Map Panel* tools.

1. Zoom the *Map Panel* in to the area where you will draw the full polygon. The closer your zoom, the more accurate your polygon boundary will be.
2. Click the *Draw a Polygon* tool. *Finish*, *Delete last point* and *Cancel* options will pop out of the *Draw a polygon* button.
3. Click in the *Map Panel* at the first point on the perimeter of your polygon.
4. Continue clicking around the perimeter.

5. If you make an error, you can use either the *Delete last point* or *Cancel* option on the *Draw polygon* tool.
6. Close the polygon by either clicking on the first point or clicking *Finish* on the *Draw a Polygon* tool.
7. The completed polygon should be opaque white, and you will see its name when you hover the cursor over it.

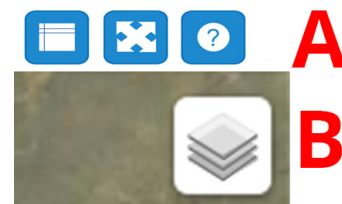
### 3.3 Delete Layers (Figure 6C)

This tool allows you to delete any of the polygons in the *Map Panel*.

1. Click the *Delete Polygons* tool. *Save* and *Cancel* tabs will pop out of the *Delete polygons* button.
2. Click any polygon you want to delete. It will disappear immediately. Click any other polygons you want to delete and they will also disappear.
3. If you accidentally delete the wrong polygon, click the *Cancel* option on the *Delete polygons* tool, then return to step 1.
4. When you have deleted the required polygon(s), click the *Save* option on the *Delete polygons* tool.


### 3.4 Upper right *Map Panel* tools (Figure 7A)

There are three tools on the upper right corner of the *Map Panel* (Figure 7A). These control aspects of the *Map Panel* appearance. Table 1 explains their use.



**Figure 7.** Upper right *Map Panel* tools (A) and map layers icon (B).

### 3.5 Map layers (Figure 7B)




Hovering over this icon  on the upper right of the *Map Panel* will open a popup of all available imagery (Figure 8). There are three main options in this popup.

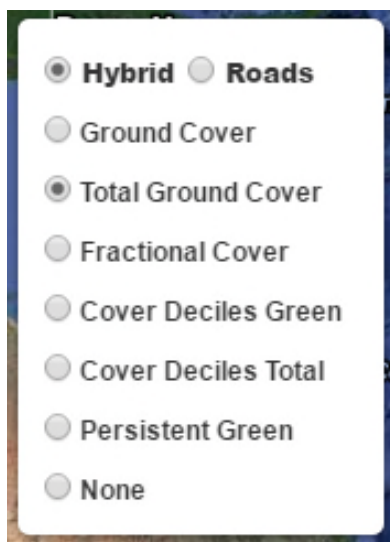
- *Hybrid* and *Roads* are listed at the top, and these are your base layers. One of these is always selected. You can toggle between them.



- The next six layers (*Ground Cover* to *Persistent Green*) are overlays. Each overlay is actually a timeseries of images, so you can see a different image for each season since 1990. When you select an overlay, additional tools appear in the lower right of the *Map Panel* (3.6 and 3.7), as well as a legend for the overlay in the lower left of the *Map Panel* (3.8).
- The final option is *None*. This option removes layer selections and forces the *Map Panel* to display only a base map. It also removes the overlay date selector (3.6), transparency slider (3.7), and overlay legend (3.8) from the *Map Panel*.

**Table 1.** Upper right *Map Panel* tool instructions.

	<i>Toggle legend.</i> This tool only appears and functions if an image overlay is selected (3.5). Click this tool to make the legend (3.xxx) appear / disappear.
	<i>Fullscreen toggle.</i> This toggles the <i>Map Panel</i> to and from full screen coverage.
	<i>Help for this panel.</i> Opens a dropdown help document for the <i>Map Panel</i> .

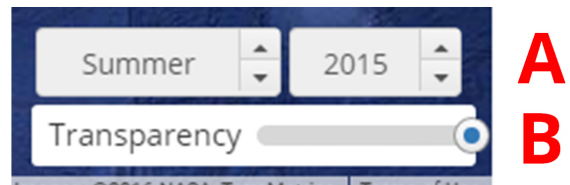


**Figure 8.** Map layer popup.

### 3.6 Overlay date selector (Figure 9A)

This tool is on the lower right of the *Map Panel*, and only appears if an overlay is selected (3.5). It allows you to view the overlay for a given year and season back to 1990. Simply use the up/down arrows on the

season and year boxes (Figure 9A) to change the overlay date. Be aware that overlay production is ongoing, and overlays may not be available for very recent dates.



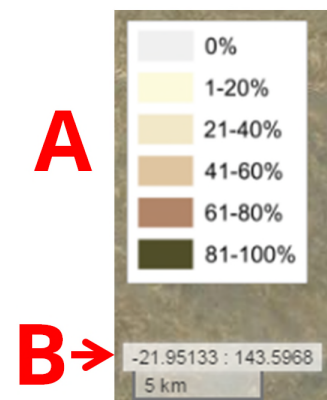
**Figure 9.** Lower right *Map Panel* tools

### 3.7 Transparency slider (Figure 9B)

This tool is on the lower right of the *Map Panel*, and only appears if an overlay is selected (3.5). The overlay will fade on/off over the base layer as the transparency slider is moved left/right. Be aware that overlay production is ongoing, and overlays may not be available for very recent dates.

### 3.8 Overlay legend (Figure 10A)

An overlay legend appears on the lower left of the *Map Panel* only if an overlay is selected (3.5). The legend will vary depending on which of the six overlays is selected. Appendix 1 explains each type of overlay.



**Figure 10.** Lower left *Map Panel* tools.

### 3.9 Cursor coordinates and scale bar (Figure 10B)

These are always visible at the bottom left of the *Map Panel*. The cursor coordinates show the latitude and longitude of the cursor at any point in the *Map Panel*. The coordinate system is WGS84. The scale bar shows the current scale of the *Map Panel*.





#### 4. The Output Panel

The *Output Panel* activates when you request any of the three *Interactive Analyses* – *Single Polygon*, *Polygon Comparison* or *PEPER*. The layout of the *Output Panel* varies according to the analysis chosen (Figure 1), and the components of each are explained below.

##### 4.1 Upper right Output Panel tools (Figure 11A)

There are a set of tools in the upper right corner of the *Output Panel* for all *Interactive Analyses*. These control aspects of the *Map Panel* appearance and behaviour. Table 2 explains their use.

**Table 2.** Tool instructions.

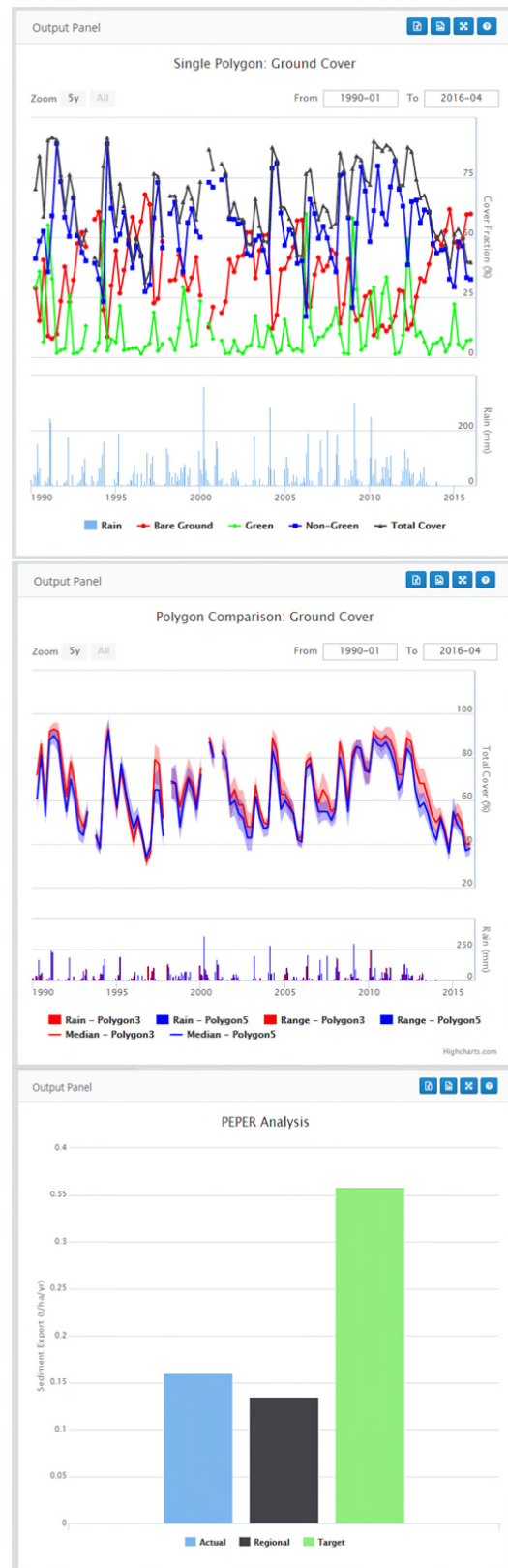
	<i>Save graph data.</i> This exports the graph data as a csv format spreadsheet to your default downloads folder.
	<i>Save chart image.</i> This exports the <i>Output Panel</i> as a png image file to your default downloads folder.
	<i>Fullscreen toggle.</i> This toggles the <i>Output Panel</i> to and from full screen coverage.
	<i>Help for this panel.</i> Opens a dropdown help document for the <i>Output Panel</i> . The material provided varies according to the type of analysis on display.

##### 4.2 Date range selector (Figure 11B)

The date range selector is available in the *Output Panel* for *Single Polygon* and *Polygon Comparison* analyses. These tools allow you to zoom to different periods of the timeseries.

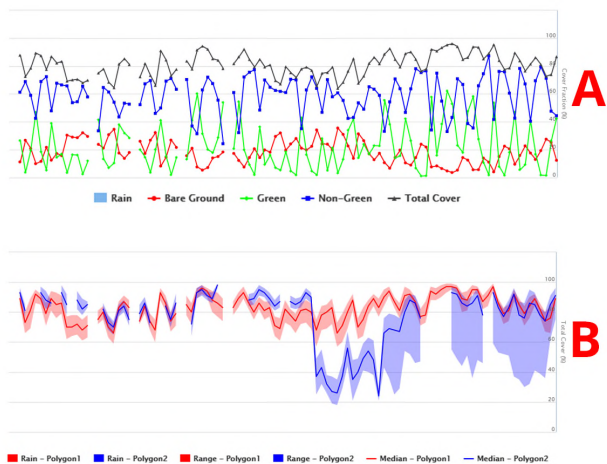
- Zoom charts to the most recent 5 years by clicking the *5y* button.
- Zoom charts to the full timeseries by clicking the *All* button.
- Choose a start and a finish date via the *From* and *To* text boxes. You can use dates in a number of formats (e.g. MM/DD/YY, MM-DD-YYYY, YYYY-MM, YYYY).

A *Single Polygon* cover chart (Figure 12A) displays four coloured lines indicating the cover of *Bare*



**Figure 11.** *Output Panel* for *Single Polygon* (top), *Polygon comparison* (middle) and *PEPER analysis* (bottom).

Ground (red), Green cover (green), Non Green cover (blue) and Total cover (black). Section 5 provides more information about how these components are constituted. The relationship between the four components on any given date is shown in Figure 13.



**Figure 12.** Cover chart and Legends for *Single Polygon* (A) and *Polygon Comparison* (B).

***Green + Non Green + Bare = 100***

***Total + Bare = 100***

***Green + Non Green = Total***

**Figure 13.** Relationship between cover fractions on any given date in a cover chart.

A *Polygon Comparison* cover chart (Figure 12B) shows the median total cover in two polygons (red and blue lines). The chart also includes corresponding red and a blue *Range* bands which are turned off initially, and turned on via the legend (4.5). *Range* bands chart the 20<sup>th</sup> to 80<sup>th</sup> percentiles of cover in each polygon. So for a given polygon on a given date, median cover is shown by the median line, 20% of the polygon has cover below the *Range* band, and 20% of the polygon has cover above the *Range* band.

#### 4.3 Rainfall chart (Figure 11D)

Rainfall charts are bar charts showing monthly rainfall in the selected polygon(s), and are part of both *Single Polygon* and *Polygon Comparison* analyses. *Polygon Comparisons* include a red and a blue bar for each of

the polygons in each month, whereas *Single Polygon* features a single blue bar for the single site each month.

Rainfall data are derived from Bureau of Meteorology datasets. If you hover the cursor over the rainfall chart, a popup will show the graphed rainfall values in that month.

#### 4.4 Chart legend (Figure 11E)

All *Interactive Analyses* (Figure 11) include a legend at the bottom of the *Map Panel*. Clicking any legend item toggles that item on and off in the graph. Items that are toggled off will display as grey in the legend.

#### 4.5 Sediment export chart (Figure 11F)

This chart only appears in the PEPER analysis. It shows three bars, one for each of three scenarios estimating hillslope erosion from the selected polygon(s). Estimates are in tons/hectare/year. Section 6.3 provides more information on interpreting this chart.

### 5. Ground Cover or Fractional Cover?

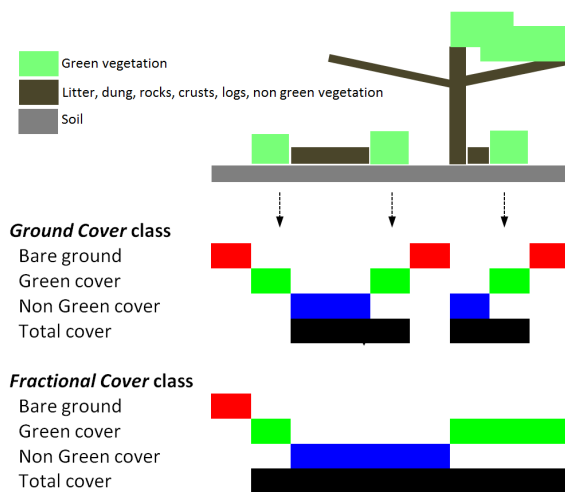
VegMachine provides access to both *Ground Cover* and *Fractional Cover* data. Both types of data divide total land cover into the same three discrete parts, *Bare Ground*, *Green cover* and *Non Green cover* (Figure 14). But the two are measured from different viewpoints. *Fractional Cover* views cover from the sky, classifying any point by the uppermost layer present. By contrast, *Ground Cover* evaluates cover at or near ground level, ignoring cover above that height.

So for example, bare soil under green tree canopy is ignored in *Fractional Cover* data because it is overhung by the green cover of the canopy, whereas the green tree canopy is ignored in *Ground Cover* measurements and the *Bare Ground* is recorded instead (Figure 14).

*Single Polygon* (2.7) and *Polygon Comparison* (2.8) analyses both offer the choice of either *Ground Cover* or *Fractional Cover* data. PEPER analyses (2.9) use the



Total Cover component of Fractional Cover data and FORAGE reports (2.10) use the Total Cover component of Ground Cover data.



**Figure 14.** The components of *Ground Cover* and *Fractional Cover*.

## 6. Interpreting reports and analyses

VegMachine produces *Single Polygon*, *Polygon Comparison* and *PEPER* analyses. It also provides FORAGE VegMachine reports. Below are some tips on how to use and interpret each.

### 6.1 Single Polygon analysis

The *Single Polygon* analysis is useful if you want to know absolute levels of cover for a particular location at a particular time. If you need such data for use outside VegMachine, you can export it as either an image or a spreadsheet (4.1).

Raw cover data needs to be interpreted carefully. Grazing land cover has three main drivers; climate, land type and management, and *Single Polygon* analyses have limited capacity to separate the influence of each on cover levels.

It's worth general note too that low *Total* cover is generally a better surrogate of poor grazing land condition than high cover is of good land condition. This because a site with consistently low cover is very likely bare, whereas a site with consistently high cover may have cover and pasture of variable quality.

### 6.2 Polygon Comparison analysis

At its most basic, *Polygon Comparison* is a useful tool for observing *Total* cover change on two sites simultaneously. But with the application of some local intelligence, you can also use it for a more nuanced view of your management.

Let's assume you want to assess cover a site called A. We know that cover is driven by climate, land type and management. Site A is near site B, so shares the same climate. A and B are also the same land type. You also know from regular visits, that B consistently has types and amounts of cover that you'd like to have across your property (so is well managed).

The three main drivers of cover are climate, land type and management. So if you compare A and B in a *Polygon Comparison*, any differences are likely due to management since they have similar climate and land type. If cover in A falls consistently below that in B, you would need to adjust management at A for it to match the aspirational target at B. Any change of course should be based on consideration of a wider range of factors, but the *Polygon Comparison* is a good starting point if you can find appropriate comparison sites.

### 6.3 PEPER analysis

PEPER was designed by the Fitzroy Basin Association to help them assess assistance applications for grazing land remediation in the region. As it uses the Universal Soil Loss Equation, and leverages Queensland wide data sets, it is applicable across a wider area. There are however a number of intrinsic limitations of the USLE that should be noted.

1. The model only estimates sheet erosion. Streambank and gully erosion is ignored by this model.
2. The model predictions are averages over extended periods ( $\geq 20$  years), not for shorter periods.
3. It has limited validation on steep slopes ( $>20\%$ ).

PEPER provides three erosion rate predictions; *Historical*, *Target* and *Regional*. The *Target* value shows how much the *Historical* erosion rate would

change if a specified cover target could be maintained. If a clear cover target is unavailable, the *Regional* prediction is based on the median regional level of cover in the same land types as your polygon. It therefore gives you erosion rates for a locally realistic cover target. Figure 15 shows the output for the PEPER spreadsheet, which is generated via the upper right *Output Panel* tools (4.1).

	A	B	C	D	E	F
1		Polygon	Hectares	Cover	Export(t/yr)	Export(t/ha/yr)
2	Actual	Project23	22.58	78	5.64	0.25
3	Target	Project23	22.58	90	3.84	0.17
4	Historical	Project23	22.58	86	4.29	0.19

**Figure 15.** PEPER spreadsheet interpretation.

#### 6.4 FORAGE reports

The VegMachine FORAGE report is one of a suite of reports generated from the FORAGE infrastructure, though it differs in that it is accessed through the VegMachine rather than rather than the FORAGE website ([longpaddock.qld.gov.au/forage](http://longpaddock.qld.gov.au/forage)).

The *FORAGE* report is designed to provide users with fast paddock scale, property wide, ground cover monitoring. It requires only paddock mapping, and is delivered by email in approximately 15 minutes.

FORAGE is currently the industry standard for ground cover analysis. It evaluates individual land type / paddock combinations, classifying each measurement against regional cover levels in the same land types. It is an approach that is not dissimilar from, but more sophisticated than the *Polygon Comparison* explained in 6.2. Each FORAGE report includes four pages of detailed help materials. Users should consult these for further information.

#### 7. More help?

VegMachine website and materials include a variety of materials to assist you. As the website evolves these will be updated and extended. As a starting point you should check that your manual matches the most recent version which is available at [vegmachine.net/help](http://vegmachine.net/help). This will be visible in the date at the top of the document.

Another good source of assistance is the help popups on the website. These are located on the upper left of the *Map Panel* and the *Output Panel* and marked by the icon (3.4 and 4.1).

Also keep an eye on the website for videos. These are in development and will cover website use and interpretation of results.

Finally, feel free to contact us via our email contact. The link is on our help page at [vegmachine.net/help](http://vegmachine.net/help).

#### Acknowledgements

VegMachine is a joint project of the Fitzroy Basin Association Inc., The Commonwealth Government of Australia, and the Queensland Government. VegMachine name is a registered trademark of CSIRO.



## Appendix 1. VegMachine image layers explained

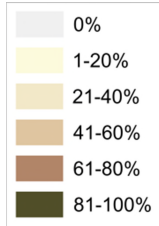
Layer and Legend	Description
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### Ground Cover



These images summarise all ground cover fractions on selected dates. Colours indicate the relative mix of ground cover fractions (Bare, Green (G) and Non-Green (NG) at any point. See this link for a full description.  
<http://data.auscover.org.au/xwiki/bin/view/Product+pages/Seasonal+Ground+Cover>

### Total Ground Cover



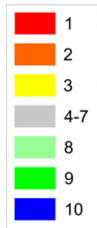
These images summarise total ground cover on selected dates. Colours indicate the percent of area with either Green or Non-Green ground cover (i.e. not bare ground). See this link for a full description.  
<http://data.auscover.org.au/xwiki/bin/view/Product+pages/Seasonal+Ground+Cover>

### Fractional Cover



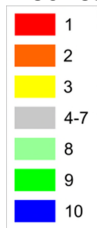
These images summarise all fractional cover on selected dates. Colours indicate the relative mix of Bare, Green (G) and Non-Green (NG) fractions at any point. See this link for a full description.  
<http://data.auscover.org.au/xwiki/bin/view/Product+pages/Landsat+Seasonal+Fractional+Cover>

### Cover Deciles Green



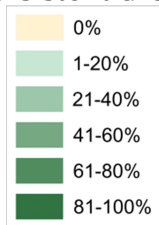
These images summarise the green fraction of fractional cover on selected dates. Low values indicate less, and high values more green cover, when compared to historical levels at the same location. See the link for a full description.  
<http://data.auscover.org.au/xwiki/bin/view/Product+pages/Seasonal+Cover+Deciles>

### Cover Deciles Total



These images summarise the total cover (green + non-green) component of fractional cover on selected dates. Low values indicate less, and high values more total cover, when compared to historical levels at the same location. See the link for a full description.  
<http://data.auscover.org.au/xwiki/bin/view/Product+pages/Seasonal+Cover+Deciles>

### Persistent Green



These images summarise total persistently green cover on selected dates. Persistent green percentages indicate the portion of vegetation that does not completely senesce within a year, which *primarily* consists of woody vegetation (trees and shrubs). See the link for a full description.  
<http://data.auscover.org.au/xwiki/bin/view/Product+pages/Landsat+Seasonal+Persistent+Green>