

# GEOGLAM RaPP Map DRAFT USER GUIDE August 2022

# **Disclaimer and Terms of use**

This user guide provides advice on using an online tool GEOGLAM RaPP Map also referred to in this document as RaPP Map.

#### Ownership of intellectual property rights

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia (referred to as the Commonwealth).

#### License

This content is made available under Creative Commons by Attribution 4.0 International (CC BY 4.0)

#### Internet

GEOGLAM RaPP Map version 8 (also referred to as RaPP map) is available from <u>GEOGLAM RAPP</u> (geo-rapp.org)

#### Terms of use

The information displayed on RaPP Map is for general informational purposes only, and is not intended to provide any commercial, financial, or legal advice. Any information in connection with RaPP Map may not be appropriate to your individual needs. You must exercise your own independent, skill, care and judgment with respect to how you use the information displayed on RaPP Map.

As a condition of using RaPP Map, you must comply with all applicable laws, regulations and thirdparty rights (including, without limitation, laws regarding the import or export of data or software, privacy and local laws). You must not use RaPP Map to encourage or promote illegal activity or violation of third-party rights. Some parts of RaPP Map (like the URL shortening function) rely upon third party APIs.

In any important matter, you should seek professional advice relevant to your own circumstances.

The information displayed on RaPP Map was consolidated by the Department of Climate Change, Energy, the Environment and Water, the Department of Agriculture, Fisheries and Forestry Australian Bureau of Agricultural and Resources Economics (ABARES), and CSIRO.

The Departments, CSIRO and Data61 ("We") make no representations or warranties regarding the accuracy or completeness of any content or the product in connection with RaPP Map. We disclaim all responsibility and all liability (including without limitation, liability in negligence, for errors or omissions) for all expenses, loss, damage, and costs which you might incur as a result of the information displayed on RaPP Map and your use of it.

RaPP Map must not be used for navigation or precise spatial analysis or for any activities where the use or failure of RaPP Map could lead to death, personal injury, or environmental damage (such as the operation of nuclear facilities, air traffic control, or life support systems).

#### Acknowledgements

RAPP Map is supported by CSIRO through funding from the <u>Australian Government's National</u> <u>Landcare Program</u>. Development has been aided by input including from Regional Agricultural Landcare Facilitators, Natural Resource Management Regions, and previous work by <u>ACLUMP</u> partners.

## Contents

Disclaimer and Terms of use	. 2
Contents	. 3
1. Introduction	. 5
1.1 What does RaPP Map do?	. 5
1.2 Who can use RaPP map?	. 5
1.3 What's new in Version 8 - 2022?	. 5
2. Getting started	. 6
2.1 Open the RaPP Map Web Page	. 6
2.2 Layout of RaPP Map	. 6
2.2.1 Map Viewer	. 7
2.2.2 Workbench (navigation pane)	. 8
3. Map view Display Options	. 8
3.1 Map Settings	. 8
3.1.1 Map View	. 8
3.1.2 Base map	. 9
3.1.3 Timeline	. 9
3.1.4 Image Optimisation & Raster map Quality	10
3.2 Gyroscope	10
3.3 Zoom	10
3.4 Compare	10
3.4.1 Compare Different Layers	11
3.4.2 Compare Imagery from Different Dates	12
3.5 Pedestrian mode	14
3.6 Line Measure	14
3.7 Feature information	15
4. Workbench (Navigation pane)	15
4.1 Show or hide the workbench	16
4.2 Search for location	17
4.3 Workbench legend	17
4.3.1 Expand and collapse the legend	18
4.3.2 View details of each layer	18
4.3.3 Hide or show data layers or data parts	19
5. Data Layers	19
5.1 Access to data	19
5.2 Search for data	19

	5.3 Add data and layers	. 22
	5.4 Remove data and layers	. 23
	5.4.1 Remove a single layer using the catalogue	. 23
	5.4.2 Remove a single layer using the workbench	. 24
	5.4.3 Remove all layers (empty the workbench)	. 24
	5.5 Reordering the layers	. 25
	5.6 Data with multiple dates	. 25
	5.6.1 Time box arrows	. 25
	5.6.2 Calendar feature	. 26
	5.6.3 View timeline	. 27
	5.7 Data catalogue layers	. 28
	5.7.1 Vegetation cover MODIS 500m	. 28
	5.7.2 Find persistent low cover areas MODIS 500m	. 29
	5.7.3 Vegetation cover deciles	. 30
	5.7.4 Contextual layers/Other layers	. 32
	5.8 My data and layers	. 34
	5.8.1 My data	. 34
	5.8.2 My polygons	. 36
	5.8.3 Other web services	. 36
6.	Analysis tools	. 38
	6.1 Analysis tool inputs	. 38
	6.2 Mean for point or region	. 40
	6.3 Proportion of region within a Total Vegetation Cover Range	. 41
7.	Reports	. 42
	7.1 Regional reports on RaPP	. 42
	7.2 Regional report finder	. 42
8.	Share, print and Story	. 43
	8.1 Share	. 43
	8.2 Print	. 44
	8.3 Story	. 44
	8.4 Export	. 44
9.	Troubleshooting	. 45
10	. Feedback	. 45

# 1. Introduction

Welcome to the help for the RaPP Map – the online Rangelands and Pasture Productivity Map tool.

## 1.1 What does RaPP Map do?

Nationally consistent and regularly updated ground cover information is a critical indicator for environmental targets related to soil erosion and land management in Australia. Ground cover or vegetation cover reduces soil erosion, increases water infiltration, enables carbon sequestration, and contributes to agricultural production of food and fibre.

This tool unlocks monthly ground cover reporting for Australia down to your location or region. With this tool you can:

- Find your place
- Bring in your own boundary file
- Explore the proportion of brown, green, total vegetation, and bare soil
- Find out which areas are protected from soil erosion
- Track vegetation cover every month using a time series
- Find areas where cover is frequently low
- See how cover this month compares with previous years using anomaly and decile maps
- View contextual layers such as land use, forests, slope, soils, water observations, and roads
- View reports for your region by land use and forest cover class
- Set targets for area protected from wind and or water erosion
- Report progress against targets.

RaPP Map is built on a platform called <u>Terria</u><sup>™</sup>, developed by CSIRO Data61. The Terria platform for web-based spatial data visualisation and analytics provides access to large numbers of spatial data services directly from the original data custodian and allows users to search, explore, share and add to maps. There are several other maps also built on this platform.

## 1.2 Who can use RaPP map?

This tool is for decision makers interested in natural resource management. This tool is best suited to reporting for Australia and its regions such as Natural Resource Management (NRM) Regions or Local Government Areas (LGAs), and large properties with paddocks or areas with similar management covering over 200 Hectares. RaPP map features monthly fractional vegetation cover from MODIS at 500 metre resolution. This regular information indicates areas at risk of wind and water (hillslope) erosion and supports strategic decision making.

## 1.3 What's new in Version 8 - 2022?

The online tool RaPP map was upgraded from Version 7 to Version 8 in July 2022. This change brought the functionality of RaPP map in line with other Terria supported products such as <u>National Map</u>. Access to the online tool and most functions continue to work as they did in Version 7. Some input data has also been updated.

# 2. Getting started

## 2.1 Open the RaPP Map Web Page

#### (YouTube Video link 1)

Launch the RaPP map tool using the URL <u>https://map.geo-rapp.org/</u> It is best to use a recent browser with WebGL support such as the latest version of Google Chrome (recommended) or Edge. Older browsers may have less functionality.

- For best performance use a recent browser
- Click Continue to close the landing page

GEOGLAM RAPP Map	
RAPP Map is the spatial data plat which is part of the Group on Ear initiative.	form for the Rangeland and Pasture Productivity (Cactivity th Observations Global Agricultural Monitoring (GEOGLAM) (5
This online tool gives access to in provides time-series data on the regional tracking of the resources is currently hosted, by Data52 (2) the National Computational Infra RAPP Map is supported by CSIR	formation about the state and condition of global rangelands. It vegetation and environmental conditions, allowing national and which sustains livestock production. It has been developed, and with the assistance of IT resources and services from structure (NCI) [2], and the AusCover [2] facility. D [2] and through funding from the Australian Government's
National Landcare Programme (	3
	MCI data cube
Autralia Conservation	DATA CUBE

Figure 1: Landing page

RaPP Map works best on a laptop, desktop, or tablet. It can be used on some mobile phones however the smaller screen may change the appearance of the interface and remove some functionality.

Help videos are available in the channel <a href="https://www.youtube.com/channel/UC7s3CQngiHpmkHHBINfzmTw">https://www.youtube.com/channel/UC7s3CQngiHpmkHHBINfzmTw</a>

## 2.2 Layout of RaPP Map

#### (YouTube Video links 2 & 3)

RaPP map has two main parts: the map viewer (Right hand side), and the workbench (navigation pane - Left hand side):

- 1) Map viewer: view the data in the display on the right. There are tools to navigate around the map, change the background map, and share what you see.
- 2) Workbench (navigation pane): the data and analysis menu on the left lets you search for locations, choose layers to view, and analyse and find reports.



Figure 2: Layout of the Rapp Map

## 2.2.1 Map Viewer

The map viewer displays the spatial data or maps that you have selected. To improve your experience, you can use the buttons to the top and right of the map viewer.

Table 1 List of buttons

🖸 About	About	Information and background on the RaPP Map project and Help – will open in a separate tab in your browser
Related Maps	Related Maps	Find other map products built using the Terria platform these will open in a separate window or tab
ွံရှိ Map Settings	Map Settings	Set the Map View, Terrain, Base Map, Timeline, Image Optimization and Raster Map Quality. See 3.1 for more information
(?) Help	Help	Find useful tips on how to use RAPP tool
E Story	Story	Create and share interactive annotated map scenes. See Section 8.3
< Share / Print	Share / Print	Generate a link to what you see on the screen which can be shared with others and open a printable version of the map

	Gyroscope Controls (Only in 3D mode)	Tilt and rotate the map. See 3.2
+ 3 -	+ , – and Home buttons	Zoom in, zoom out and default view
¢	Location	Centres the map to your current location if you have location services turned on your device
	Compare	Turn split screen mode on and off. Section 3.4
Ť	Pedestrian Mode	Helps "touring" a 3D landscape, navigating at the terrain level
	Line measure	measuring tool to measure distance between points in kilometres.
P	Give Feedback	You can send feedback directly from the maps, by clicking on the Feedback button

More information on this map viewer display options is at section 3 Map viewer Display Options.

## 2.2.2 Workbench (navigation pane)

The workbench or navigation pane is on the left. From the workbench you can search for locations, choose layers to view, and analyse and find reports. Click *Explore map data* to access more functions from a pop-up window.

# 3. Map view Display Options

## 3.1 Map Settings

You can change base maps, toggle between 2D and 3D data views, terrain availability if supported by the data and image optimisation designed for average performance computers.

## 3.1.1 Map View

Map view lets you toggle between 3D terrain, 3D smooth and 2D. Default view is 2D which shows a vertical map view with north to the top. To visualise data in 3D, select the 3D terrain or 3D Smooth view. The map settings include Show terrain and Image optimisation only in 3D mode.

Select 3D Smooth to show a perspective view which has no elevation change. The maps or images are draped over a smooth globe.

Select 3D Terrain to show a perspective view with an interpretation of the elevation changes in the terrain.

## 3.1.2 Base map

The base map can help find places of interest, provide context and satellite imagery. There are several different base maps to choose from. If you are finding locations of interest, you may prefer to see aerial imagery with place labels or the roads base map. If you are exploring landscapes, you may find aerial imagery without labels or natural earth rendering most useful. For analysis or to explore other data which you have added to the map viewer you may prefer the more understated base maps positron (light) or dark matter.

#### Why cannot I see the base maps on display?

Base map is only visible when there are no loaded raster layers on the display. By default, Total Vegetation cover layer is preloaded. To hide the layers, click the white box in the navigation pane next to each layer.

#### Which basemap should I choose?

**Make sure a 2D basemap** option is selected when using analysis tools to generate cover reports for a polygon or region or to minimise computer memory use.

3D basemaps provide a more realistic globe display however these use more memory than 2D basemaps. 3D Terrain maps require the use of a current browser and WebGL supported graphics cards. Zooming in with 3D Terrain perspective view can provide a detailed exploration of the landscape.

Select a 2D basemap by:

- 1. See the basemap by removing all map layers from display
  - a. click the white box in the navigation pane next to each layer
  - b. each layer now shows a hollow box next to the legend.
- 2. Click Map settings on Map viewer
- 3. Click 2D top right
- 4. Choose a 2D base map. The selected basemap shows a blue border, a tick in the top right corner and shows in the map viewer.
- 5. To close the map selector, click the x in the top right of the map selector.

## 3.1.3 Timeline

Do not activate the Timeline from the Map Settings Timeline box. A timeline Always show check box will appear in the Map settings window if 3D smooth or 3D terrain Map View are selected. Do not check on this box. This is a known bug and is not compatible with the RaPP map data layers or analysis tools. If you have switched this on and need to remove it, refresh your browser and re-open RaPP map using a 2D basemap (see 3.1.2)

To use a timeline, to display different available times for a data layer, select the use timeline button (Figure 3) in the Workbench/Navigation pane. See section 5.6.3 for more information.



Figure 3: Timeline

## 3.1.4 Image Optimisation & Raster map Quality

You can move the quality slider or select the native resolution to be able to visualise high intensity datasets on your machine.

## 3.2 Gyroscope

When in 3D mode, click gyroscope in the centre of the Compass Control (picture above) and drag slowly upwards to tilt the view into a Perspective View. Drag downwards to tilt the view back to vertical. The further you drag, the faster it tilts. Release the mouse button when you reach the desired view.

Double-click the gyroscope in the centre of the Compass Control to return the view quickly to a vertical view with North to the top at the current location and scale. See <u>Map navigation</u> and <u>display – Terria Platforms User Guide</u> for more information.

## 3.3 Zoom

Click the + (plus) icon for zoom in, + (minus) for zoom out and house icon for default view display.

To zoom to the extent of a data layer shown in the Map View find the layer legend in the Workbench and click Ideal Zoom.

## 3.4 Compare

## (YouTube video link 3)

The compare function is useful to show two different data layers side by side, or two different time points of the same data layer.

To use Compare function first make sure the Map View is on 2D mode. Compare and timelines do not work using 3D Terrain or 3D smooth base maps. See 3.1.2 Base map for more information about base maps.

The compare function can be launched in two ways

- Using the Compare button on the right of the map viewer (3.4.1 Compare different layers), OR
- Using the Compare button for a single data layer containing multiple time periods. Access this option in the Workbench legend for your chosen data layer. Expand the legend and click the three dots next to About data to find this option. (3.4.2 Compare imagery from different dates).



Figure 4: Compare buttons - map viewer and workbench

## 3.4.1 Compare Different Layers

You can display and compare *two different layers*, e.g., view the Total Vegetation Cover for January 2022 and Vegetation Cover Deciles for January 2022

- Remove/ deselect all unwanted layers and make sure Map View is on 2D mode. You
  can either add your data layers of interest first or activate compare first. In this
  example we will activate compare and then add the data layers.
- 2) Click the compare button on the right-hand side of the map viewer (Figure 5). Hovering over this button should expand the symbol to read "Compare" with a hoverover tooltip which reads "Enable side by side comparison between two sets of data". Clicking this Compare button will split the Map viewer display. Once it is activated, the compare button will turn into blue colour with a X sign next to it.



Figure 5: Compare button - split screen active

- 3) Add a layer. e.g., Total Vegetation Cover layer (PV+NPV, monthly) for January 2022 as described in 6.3 Add and remove data and layers.
- 4) When the Compare button is active for each data layer in the Workbench you will see a new option to control whether each data layer is displayed on the left, right or both sides of the screen split: Left will show the chosen layer on the left side, Both on both sides, and Right on the right side. Figure 6 shows the legend item for total vegetation cover with the split screen active and Both selected to show Total Vegetation cover on both sides of the split screen.



Figure 6: Compare - direction boxes

- 5) Click *Left* or *Right* to view the data layer on only one of the two sides of the split screen to enable comparison.
- Add a new layer, e.g., Vegetation Cover Deciles (Explore map data < Australia < Vegetation Cover (MODIS, 500 m) < Monthly < Vegetation cover deciles (Monthly), click +. For more information about adding layers refer section 6.2. Click *Right* on the direction boxes.
- 7) Once the layer is added, select the date e.g., "January 2022"
- 8) Drag the slider icon (with three vertical lines on a white circle) in the middle of the split line left or right to adjust the views.

## 3.4.2 Compare Imagery from Different Dates

To display *two different times for the same layer*; e.g. view the Total Vegetation Cover for January 2012 and January 2022 you will use the compare – duplicate and show splitter option.

- 1) Add the Total Vegetation Cover layer (PV+NPV, monthly). If the layer is already loaded by default, you can now see a new line of boxes with Left, Both and Right inside the layer window.
- 2) Below the Total Vegetation Cover, on the right-hand side, there is a show more action button with three vertical dots next to About data. Click this button and then click *compare*. This will add a duplicate layer of Total vegetation Cover.



Figure 7: More option button

Total Vegetation Cover (PV+NPV, Monthly)				
Q IDEAL ZOOM				
Opacity: 100 %				
Left Both 主 Export			rt	
Time: Ø Remove				

Figure 8: Compare button to duplicate the layer

- 3) Note: ONLY click Compare once else you will get multiple copies of the layer
- 4) Select different time periods for the two layers (section 5.6)
- 5) Then on the duplicate Total Vegetation Cover layer (PV+NPV, monthly) layer, do the same and select another time (you want to compare to) e.g. "January 2022"
- 6) Once you selected the two periods of time to compare, select *Left* from the direction boxes for the first total vegetation layer (January 2012) and *Right* for the second layer (January 2022).

Q IDEAL ZOOM					
Opacity: 100 %					
Left Both Right					
Time:					
<ul> <li>✓ January 2012</li> <li>▶ ∴ [//</li> </ul>					
0 20 40 60 80 100 Total Vegetation cover [%]					
Total Vegetation Cover (PV+NPV, Monthly)					
Q IDEAL ZOOM					
Opacity: 100 %					
Left Both Right					
Time:					
0 20 40 60 80 100 Total Vegetation cover [%]					

Figure 9: Choosing the sides of layers for display

7) Now the first layer (January 2012) and second layers (January 2022 will be displayed on left and right sides on the display. You can drag the slider icon (with three vertical lines on a white circle) in the middle of the split line left or right to adjust the views.



Figure 10: Slider button. Left side of the screen shows Total vegetation cover for January 2012 and right side shows Total vegetation cover for January 2022



Figure 11: Left side: Total Vegetation cover for January 2022. Right side; Vegetation cover decile January 2022

8) To remove the compare mode on the map

Click the X to close/ remove the compare mode next to the compare button.

## 3.5 Pedestrian mode

Pedestrian mode is not recommended for use with fractional cover data or when doing any analysis in Rapp Map. It only works only on 3D mode. You can turn on Pedestrian mode by clicking the pedestrian icon. Pedestrian mode is intended to allow you to navigate and view 3D terrain data from a pedestrian perspective. To exit pedestrian mode and reset the view to the extent of the whole of Australia either click the Home icon in the zoom tools, or press the refresh button in your browser which will also reset the data layers.

## 3.6 Line Measure

Line measure helps you to measure the distance in kilometers between two or multiple points or locations on the map view. You can measure by activating the tool, clicking on one point on the map and then another.

## 3.7 Feature information

The feature information window allows you to find out more information about data at any chosen location. You can click on a pixel and find out the latitude, longitude, and values for visible data layers at that location.

The feature information window will pop-up when you click anywhere on the map. This window shows for the selected pixel:

- the layer names for the data layers displayed on the map viewer which have information available for the pixel on which you have clicked
- the values for fields in each data layer the Latitude and Longitude To use the feature information window:
- Toggle between feature information from each data layer using the arrows to the right of each layer name on the feature information window, to show and hide information from each layer. The viewer will only show information from one layer at a time.

Featur	e Information 👻	×			
Vegetat	Vegetation Fractional Cover (PV, NPV & BS, Monthly) - Site Data 💌				
x	15580312.349424				
у	-2910110.540873				
time	2022-06-01T00:00:00.00	00Z			
	bare_soil 47				
bands	phot_veg 7				
	nphot_veg 43				
		Download this Table			
Total Ve	egetation Cover (PV+NPV, M	Ionthly) - Site Data			
Lat / Lo	n	25.27969°S, 139.96033°E			

Figure 12: Feature Information window

- Layers appear in the order in the Workbench/ Navigation pane.
- Download information for the pixel from a data layer as a JSON file by clicking 'Download this table'
- Close the feature information by clicking the x at the top right of the pop-up window.

Why does the feature information say No data is available here?

You may have no data layers displaying or you have clicked outside the extent of these layers. See add and remove layers from the map viewer.

# 4. Workbench (Navigation pane)

Workbench or Navigation pane is situated on the left-hand side of your Rapp Map browser window (Figure 2). The workbench consists of Location search (Search for locations), Data and analysis tools (Explore map data – Global, Australia, Regional Reports, Analysis Tools, My data / Upload), and the Legend for data layers which have been added to the map view.



Figure 13 Workbench: location search, tools, and legend

By default, three data set layers including Place Labels, Coastlines/ Boarders/ Roads and Total vegetation Cover are preloaded. When a data set is added to the map via the Data Catalogue, a legend for that data set will appear at the top of the Workbench.

From the Workbench you can:

- Show or hide the workbench (see 4.1)
- Search for locations (see 4.2)
- View the legend for displayed data and change how data appears in the map (See 4.3.2)
- Add and remove included layers (see section 6.3) and your own data (see section 6.7)
- Run time series analyses using fractional vegetation cover (see section 6)
- Find regional fractional vegetation cover reports (see section 7)
- Set the order in which data is shown on the map (see 5.5).

#### 4.1 Show or hide the workbench

To hide or remove the workbench/Navigation pane, and enlarge the map view, click the X button at the top right side of the workbench/Navigation pane window.

GEOGLAM RAPP Rangeland and Pasture Productivity	X Z About 🔡 Related Maps
Q. Search for locations	
⊕ Explore map data	
DATA SETS (3)	АШ
Place Labels	· Radiation
Coastlines / Borders / Roads	
Total Vegetation Cover (PV+NPV, Monthly)	-
Q, IDEAL ZOOM	
Opacity: 100 %	•

Figure 14: Hiding/ Removing the workbench/Navigation pane window

To show or restore the workbench (navigation pane) click 'Show workbench' in the top left of the map viewer.



Figure 15: Show workbench/ Navigation pane button

## 4.2 Search for location

## (YouTube video link 3)

You may want to know more about the location where you are, find an address, locality, or map reference, find a region, or zoom to your own custom polygon or point using your own file.

To search for a location:

- Type a place name or address into the search for locations box at the top of the navigation pane on the left of your screen (RaPP map will begin searching as you type) You can also search for latitude and longitude. Enter in decimal degrees, e.g. - 31.9531, 141.47158 for Broken Hill.
- 2) Select the best match from search results below the search bar. When you click on the search result the RaPP map view will zoom to your chosen location.

Click the x to remove search terms from the search box.

## Show my current location

Use the current location button on the right-hand side of the map viewer. If you have location services enabled, this will zoom and centre the map at your current location.

## 4.3 Workbench legend

The workbench legend (Figure 16) displays details for each layer which has been added to the RaPP Map view. From the workbench legend you can:

- Expand and collapse the legend 4.3.1
- View details of each layer 4.3.2
- Hide, show, or remove data layers or data parts in the map view and time series charts 4.3.3
- Zoom to layer extent (ideal zoom)

- Set the display order of layers 5.5
- Set the opacity of some layers
- Choose the display date for time series layers 5.6
- Turn on and off the time series slider 5.6.3

## 4.3.1 Expand and collapse the legend

To expand or collapse the legend for a data layer, click the arrow to the right-hand side of the layer name in the Workbench legend (Figure 16).

🔳 Pla	ace Labe	ເຮ			
🗌 Co	astlines	/ Border	s / Roads		
Tol Mc	tal Vege onthly)	tation Co	over (PV+N	PV,	•
Q, I	IDEAL ZO	ом		JT DATA	:
Opacity Time:	: 100 %	-			-
		July 202	22		1 🗠

Figure 16 Arrow to expand or collapse data legend

To collapse or minimise all legends for all data layers click *Collapse all* at the top of the workbench legend (Figure 17).

Q. Search for loca	ations	
Explore map	o data 🔶	Upload
DATA SETS (3)	⊖ Remove All	Collapse All

Figure 17: Collapse all the dataset legends

## 4.3.2 View details of each layer

When layers details are shown in an expanded format the legend may show:

- Ideal Zoom: zooms to layer extent
- About Data: view information about the layer in the Explore map data window
- Opacity slider: You can move the opacity slider to see the layer transparency change in the display. If you set the opacity to 0%, the layer will become completely transparent (Note: this is particularly useful when you want to see the underneath layer e.g. base map of the location)
- Time box: for time series data the date of layer is shown, use the navigation buttons to view other dates from the time series
- The map legend explaining colours shown for this layer in the map viewer

## 4.3.3 Hide or show data layers or data parts

From the workbench legend you can choose to show or hide or remove layers in the map view. Showing and hiding layers is useful to quickly toggle between map views. To remove unwanted layers completely see section 5.4.

Hide, show, or remove data layers or data parts

- Solid white box = show
- Hollow box = hide



Figure 18: Turning on and off the Place Labels dataset display

# 5. Data Layers

When the tool opens three dataset layers will display on the map viewer and be listed in the workbench/ navigation pane:

- Place labels
- Coastline/Borders /Roads
- Total Vegetation Cover (the sum of live and dead vegetation and includes trees) as percent cover in the pixel

Turn off any layer by clicking on the white square to the left of the layer title. This will remove the layer from the map view.

## 5.1 Access to data

RaPP Map is a fully open architecture. When you access data through it, you are typically accessing the data directly from the custodian of that data. Data may be updated regularly.

To see the data in more detail, please refer to the Data Catalogue in the <u>RaPP Map</u> itself. Click the Data Catalogue tab and expand the Data Set group names. If you have a dataset you think would suit the RaPP Map then please get in contact with us by emailing geoglam.rapp@csiro.au.

Any information provided by data custodians displayed on the RaPP Map is provided as is and on the understanding that the respective data custodian is not responsible for, nor guarantees the timeliness, accuracy, or completeness of that information. If you intend to rely on any information displayed on the RaPP Map or <u>data.gov.au</u>, then you must apply in writing to the respective data custodian for further authorisation.

You acknowledge that your use of the RaPP Map or <u>data.gov.au</u> means that you have provided your acceptance of these terms and conditions.

## 5.2 Search for data

If you want to search for and add data layers to the RaPP map view you can find available data layers listed in the data catalogue. The data catalogue is separated into Global and National Datasets. Global datasets have an extent across multiple continents, while datasets

under the Australia tab may be specific to Australia with an extent equal to or smaller than Australia, for example a single state or territory.

There are three main ways to search the data catalogue:

- Browse the data catalogue Global and Australia tabs
- Search from the data catalogue tabs search bar
- Search for data from the Search for locations search bar

#### Browse the data catalogue - Global and Australia tabs

If you want to explore data layers that are available, you can use the Global and Australia tabs.

- 1) Click Explore map data on the Workbench/Navigation pane,
- 2) Select Australia on the top ribbon of the data catalogue window for Australian datasets.

Global	Australia	Regional Reports	Anal	lysis Tools	My Data
Q Sear	ch whole cata	alogue		Austral	lia
Vegetation Cover (MODIS, 500m)		•			
🗁 Mo	nthly		•		
Veg BS,	etation Fractior Monthly)	nal Cover (PV, NPV &	Ð		

Figure 19: Selecting Australia from the Data catalogue top ribbon

- 3) Data are grouped into themes
  - a. Vegetation cover (MODIS, 500m)
  - b. Vegetation cover Landat/Sentinel (30/20 meters)
  - c. Land Use / Land Cover
  - d. Landscape attributes
  - e. Boundaries
  - f. Surface water
  - g. Transport
- 4) Expand each theme using the arrow on the right-hand side to see sub-themes and available data layers
- 5) To learn more about a dataset click the Data layer name. This will display information about the data layer in the right-hand side of the data catalogue window. For data layers open in RaPP map data viewer information about the data layer can also be accessed by clicking About data in the workbench to open the same window.



Figure 20: See data layer details

#### Search the list from the data catalogue tabs search bar

If you know the name of the data layer you are looking for you can type into the search bar under the Global or Australia tab.

- 1) Open the data catalogue by clicking Explore Map data
- 2) Type the layer name or keyword into the search bar
- A list of layers matching your search criteria will be returned below the search bar (Figure 21).
- 4) Click layer titles to find out more.
- 5) Click the Plus symbol or add to map to add to the map viewer.
- 6) Click x to clear the search bar.
- 7) Click Done to close the data catalogue window.

Global Australia Regional Reports An	alysis Tools My Data	
Q fractional cover	×	
Search Results		
Vegetation Fractional Cover (PV, NPV & BS, Monthly)		
Vegetation Fractional Cover (PV, NPV & BS) (8-day)		

#### Figure 21: Search for data layer in the search bar

Search for data from the Search for locations search bar

If you know the name of the data layer you are looking for you can also search directly from the Search by locations search bar without opening the data catalogue.

1) Type the layer name of keyword into the Search by locations search bar

- 2) Click the black Search "in the Data Catalogue prompt directly below the search bar (Figure 22).
- 3) This will open the data catalogue showing the search returns.
- 4) Click the layer names to find out more. Click + or add to map to display in the map view.
- 5) Click done to close the data catalogue.



Figure 22: Search for data layer in the Search for locations search bar

## 5.3 Add data and layers

## (YouTube video link 4)

You can add data and layers to RaPP map data viewer from the data catalogue, from your local computer or other web locations (see section 5.7 My data and layers).

Once you have located a data layer of interest in the data catalogue (section 5.2) there are two ways to add the dataset to your RaPP map view (Figure 23):

- 1) Click the Plus symbol next to the data layer name, or
- 2) Click Add to the map in the top right of the dataset metadata You can select the dataset you want from the broad categories from the left side of the window



Figure 23: Add a data layer to map viewer using the catalogue

To add your own data or other public data see section 5.7 My own data and layers.

#### 5.4 Remove data and layers

There are several ways to remove and hide data layers from the RaPP map view.

- Removing layers means that they no longer show in the workbench. Layers that have been removed are unavailable for view or analysis. If you wish to use these layers again, they will need to be added again using the same method (section 5.3 or 5.7). Removing unused layers is better for analysis.
- Hidden layers remain in the Workbench but are not shown in the Map view (4.2.2). Hidden layers are simpler to bring back into the Map view. Hiding, re-ordering, or changing layer order are better options for switching between data layer views.

Options to remove data and layers from the RaPP map view

- Remove a single layer using the catalogue
- Remove a single layer using the workbench
- Remove all layers (empty the workbench)
- Return to the default display

#### 5.4.1 Remove a single layer using the catalogue

There are two ways to remove datasets from your RaPP map view using the data catalogue (Figure 24).

- 1) Click the Minus symbol next to the data layer name, or
- 2) Click Remove from the map in the top right of the dataset metadata



Figure 24: Remove a data layer from map viewer using the catalogue

3) Click Done to close the Data catalogue window and return to the map view

## 5.4.2 Remove a single layer using the workbench

To remove a single layer from the workbench

- 1) Locate the layer legend in the workbench legend. If necessary, expand the legend until you can see the three dots icon
- 2) Click the three dots icon
- 3) Click Remove



Figure 25: Removing a dataset using the workbench

## 5.4.3 Remove all layers (empty the workbench)

Removing all layers in the workbench area (including the layers loaded by default) will empty the workbench leaving only the basemap. To empty the workbench click *Remove All* under the blue "Explore map data" and "upload" tools (Figure 26)

Note: all layers will be immediately removed leaving only the base map. There is no warning or undo for removing all layers. To return to the default view refresh the page or reload https://map.geo-rapp.org



Figure 26: Remove all data layers

## 5.5 Reordering the layers

To change the order of the layers in the workbench/navigation pane, click a layer and drag it up or down and drop. Reordering the layers is simple and quick way to view what is underneath a particular layer without having to turn it off.

## 5.6 Data with multiple dates

## (YouTube video link 4)

RaPP Map is intended to allow view and analysis of data with multiple different dates. This is also called time series data. For time series data, there are three ways to change the date of the image such as using the time box, the calendar, and the timeline.

## 5.6.1 Time box arrows

The first time a time series data layer loads it will usually show the latest date in the time box and in the map. The time box can be seen in the workbench when the data legend is expanded (Figure 27).



Figure 27: Time box

To change the date of data that is displayed in the map view using the time box you can use the time box arrows (Figure 28) or click the time box to select a year and month using the calendar feature (Figure 29 and 30).

Use the arrows on left and right side of the time box to go to previous and following time periods for this data layer (Figure 28).



Figure 28: Time box arrows to select time display

## 5.6.2 Calendar feature

Where there are many time points in the time series data you may wish to choose a nonadjacent time period. For example, for Total vegetation cover (PV+NPV monthly 500m from MODIS) there is data for every month in the record back to 2001). To access other months faster than using the arrows you can click the time box. This will open a dropdown list of years and then a dropdown list of months.

- 1) Click the time box
- 2) Choose a year
- 3) Choose a month

Clicking the time box will open a drop-down list of years, from which then you can select the year you want. For example 2012 (Figure 29). Click anywhere on the line for that year to select it. Note that even though this screen appears to display months within each year you cannot select a month until you progress to the next screen.



Figure 29: Selecting a year

After selecting the year select the month from the new drop down. e.g. "January 2012" (Figure 30). The map display and time box will be updated to this date.



Figure 30: Select the month

## 5.6.3 View timeline

#### (YouTube video link 3)

The timeline will add a slider bar to the bottom of the map view. This slider bar can be used to select time periods to display in the map or play a time lapse.

To add the timeline and adjust the date for a time series data layer

- Locate the data layer legend in the Workbench
- Click the Use timeline button which has an arrow and 5 bars in it to the right of the date (Figure 31)
- A slider bar appears on the bottom of the map screen.
- Click on the blue balloon (far right of timeline) and slide balloon to the desired date. Once you have selected a new date this will also display in the Time box so you know the date selected



Figure 31 View timeline function in workbench legend



#### Figure 32: Timeline

To see the timeseries change from the selected date to present, you can click the play button. The speed of the play can be controlled by the double arrows. Click the pause button to go to the beginning date.



Figure 33: Timeseries buttons

## Why is my timeseries change playing very slowly?

This could be because of the high number of loaded layers in the display. Make sure the base map in 2D mode. Turn off all other unnecessary datasets and run again (section 10).

## 5.7 Data catalogue layers

Rapp map comes with a data catalogue containing data layers for view, analysis, reporting and sharing. RaPP map also enables you to add other public data or your own data and layers either from files or web services.

Note that only data catalogue layers will be available to other users if you use the share or story functions (section 7). Your own layers will not be visible to other users. Your own layers will be removed when refreshing the browser or starting a new session so make sure to download and save any analysis that you have completed before ending your session.

## 5.7.1 Vegetation cover MODIS 500m

## (YouTube video link 4)

Remotely sensed fractional vegetation cover products separate vegetation into green (photosynthetic), brown (dry or dead) and bare soil. The RaPP map tool allows you to view fractional cover at different scales from different sensors. Most analysis tools in RaPP map are designed for use with fractional cover products from MODIS at 500m by 500m pixel size. While these pixels are larger than from other sensors the frequency of the product provides tactical information.

- Vegetation Fractional Cover (i.e. shows the green (PV) dead or senescent (NPV) and bare ground fractions)
- Total Vegetation (sum of the green and dead). This layer can be used for time series analysis using points, and polygons (section 5).
- Vegetation cover anomaly (how far the pixel monthly value is away from the mean of the same month from other years)
- Vegetation cover deciles (ranking of the pixel monthly value in the record of vegetation cover compared with the same month in other years. Highest (blue) to lowest (red)).

To find these layers in the data catalogue go to:

- 1) Explore map data
- 2) Australia
- 3) Then select the layers under Vegetation Cover (MODIS 500m) by clicking the plus sign on the right-hand side of the layer name

## 5.7.2 Find persistent low cover areas MODIS 500m

#### (YouTube video link 4)

The cover threshold is the amount of Total vegetation cover required to control erosion. The cover threshold indicates whether each pixel is protected from soil erosion.

Different cover thresholds are required to reduce wind or water erosion. Cover thresholds that reduce water erosion (specifically hillslope erosion) vary in different places.

In general, total vegetation cover is recommended to be:

• 50% to control soil loss by wind erosion (Leys 1999)

• 70% or greater to control soil loss by water erosion (Lang 1979). Higher cover thresholds are required on steep slopes (>12%, or 7 degrees), erodible soil types and high rainfall areas.

Cover thresholds apply to a small area or pixel and should not be taken from the average over larger areas or regions.

You can check which part of the country has persistently low ground cover. Go to Explore map data, select Australia and select summaries under the vegetation Cover. Frequency of total vegetation cover data sets are grouped by different percentages (from 30 to 95%) of threshold level of the pixel. For each threshold level, data is grouped in to annual and monthly frequencies.

For example if you want to display the frequency of Total vegetation cover below 50% January

1) Click *Explore map data*, select Australia on the top ribbon of the data catalogue window for Australian datasets.

2) Click the drop-down button next to Vegetation Cover (MODIS, 500m) and select summaries.

3) Click the drop-down button next to Frequency of Total Veg Cover below 50%

4) Click the plus + button next to January – Tot Cov below 50% to load the layer. This shows the frequency of Total vegetation cover equal or lower than 50% in January over the time series.

4) Click the legend below the timebox to see the information about the legend in detail.



Figure 34: Map showing frequency of total vegetation cover below 50% for January

Dark brown colour areas show pixels where Total vegetation cover is more frequently below 50% for the month January over the timeseries.

## 5.7.3 Vegetation cover deciles

Vegetation cover deciles shows the ranking for the total vegetation cover in each month, in relation to the vegetation cover in that month for all years in the time-series.

1) To add vegetation cover deciles, click the drop-down arrow next to Vegetation Cover (MODIS, 500 m) category to view the available MODIS vegetation cover datasets (For more information see section 6.3.1). Available datasets include

- Monthly: vegetation products derived from imagery collected over the month.
- 8-day: vegetational fractional cover and Total Vegetation cover derived from the 8-day composite imagery
- Summaries: Annual and monthly frequency (in percentage values: 0-100) of Total Vegetation cover lower than various percentages in all months and all years

2) Click the plus + button next to Vegetation Cover Deciles (monthly) to load the layer



Figure 35: Loading Vegetation cover Deciles (Monthly)

3) Now you can see the monthly vegetation decile map on the map viewer display. Select the month and year from the time box E.g: January 2022.

4) Click the legend below the time box of the layer to see the information about the legend in detail.



Figure 36: Vegetation cover Decile legend



Figure 37: Vegetation cover decile map for January 2022

In Figure 37 dark red areas show that in January 2022 these pixels were in the lowest decile of total vegetation cover recorded over the time series for January while dark blue areas are in the highest decile of total vegetation cover recorded over the timeseries for January.

More comprehensive reports of the vegetation cover condition for Natural Resource Management (NRM) Regions and the Local Government Areas (LGAs) can be found in the Regional Reports tab (See Section 8 for more information).

## 5.7.4 Contextual layers/Other layers

There are some additional layers in the data catalogue that help understanding the patterns of total vegetation cover.

- Land use/ land cover
   Catchment scale land use and Forest are available. This is a combination of land use data and forest cover data.
- Landscape Attributes
   Landscape Attributes consist layers of physiographic regions, slope and generalised soil order map of Australia.
- Boundaries

Regions and boundaries are available for Australia. To add a region or boundary file for view or analysis, click *Explore map data* and select Australia on the top ribbon of

the data catalogue window for Australian datasets. Click the drop-down arrow next to Boundaries to view the available boundaries for Australia.

Available boundaries include:

Australian Rangelands:

The rangelands are those areas where the rainfall is too low or unreliable and the soils too poor to support regular cropping. They cover about 80% of Australia and include savannas, woodlands, shrublands, grasslands and wetlands. See <u>Australian</u> <u>Collaborative Rangelands Information System (ACRIS) - DCCEEW</u> for more information

NRM regions 2017:

NRM Regions is a collective of 54 NRM organisations from all over Australia. See <u>NRM Regions Map – NRM Regions Australia</u> for more information

Local Government Areas:

Local Government Areas are an approximation of gazetted local government boundaries as defined by each state and territory. See <u>Local Government Areas</u> <u>Australian Bureau of Statistics (abs.gov.au)</u> for more information

River Regions (Bureau of Meteorology):

Shows National River Basin Boundaries. See <u>Australian Drainage Divisions and</u> <u>River Basin Boundaries: About: Water Information: Bureau of Meteorology</u> (bom.gov.au) for more information.

Statistical regions (Australian Bureau of Statistics)

A hierarchy of statistical areas according to ABS Australian Statistical Geography Standard (ASGS). See <u>Australian Statistical Geography Standard (ASGS)</u> <u>Edition 3, July 2021 - June 2026 | Australian Bureau of Statistics (abs.gov.au)</u> for more information.

Unfortunately, you can't search for individual regions from these boundaries but, once a boundary or region layer is added to and displays on the map you can pan and zoom, and then find out which region a pixel is in by clicking the map and reading the feature information from the pop-up box on the right-hand side of the viewer. You can also navigate to an area of interest using search for locations section 4.2.

• Surface Water

Surface water map produced from 25 years of Landsat imagery across Australia is available.

#### Transport

Road layers with national route numbers are available.

#### I'd love to have a new layer in the data catalogue. Can I suggest?

Absolutely! Just email your suggestion to geoglam.rapp@csiro.au or use the Feedback functionality at the bottom right corner of the map.

## 5.8 My data and layers

#### (You Tube video link 5)

As well as using the preloaded data layers listed in data catalogue which can be accessed through Explore map data Global and Australia tabs you can upload or add other data to RaPP Map.

You can add your own data from the device you are using with RaPP Map, public web services from other providers, or draw polygons or select points on the RaPP Map viewer.

What can I do with my data and layers uploaded into RaPP map?

- View, pan, zoom
- Show and hide layers
- Link CSV files to Australian standard regions and see the data in the map view
- Print map and Print view
- Analysis of time series MODIS fractional cover using your own vector data: points or polygons (see section 5 Analysis).

#### What can't I do with data uploaded into RaPP map?

Data that you upload, polygons you draw, or points you select, will only be available and visible to you during your current session of RaPP map. Uploaded data will not be available or visible once the browser is refreshed, and will not be preserved or made available if you use the following RaPP features:

- Story
- Share

#### 5.8.1 How to upload data

To upload your data into RaPP map you can either:

- Drag and drop the data into the map view, or
- Click *Upload* from the Workbench.

Follow these steps to upload data from the workbench

- 1. Click Upload or Explore Map data to access the Data catalogue window
- 2. Click My Data
- 3. Find your data. Your data may be local (stored on your device) or web data (available from a URL)
  - a. For local data stored on your device you may prefer to drag and drop. Otherwise click *Add Local Data*.
    - i. Click Browse to navigate to where your data is stored.
    - ii. Select the data you wish to add. Click Open.
    - iii. Your data should now be added to RaPP map view, Workspace legend, and details such as the data layer name and extent should show in the data catalogue window.
    - iv. Click *done* on the top right to see your data in the map view.
    - v. For more information about drawing your own polygons see 5.8.2. For more information about using your polygons for analysis see 6.1.
  - b. For web data, click Add Web Data. See 5.8.3 for more information.

RaPP map compatible formats for local data include GeoJSON, KML or KMZ, CSV, CZML, GPX, JSON, GeoRSS, gITF, Shapefile (zip) and IFC.

Most of these spatial vector data formats allow you to add points, lines and polygons. There are some differences in functionality. Zipped shapefiles and GeoJSON enable opacity control however KML and KMZ do not.

CSV files

RaPP Map can display two kinds of CSVs/spreadsheets:

- Points
- Data for Australian standard regions.

For more information on special features available with CSV files see the Terria platform user guide <u>https://userguide.terria.io/interactions-functionalities-and-workflows</u>.

**Points:** To use a CSV spreadsheet to show point locations it will need a point location (latitude and longitude) for each row, expressed as two columns: Lat and Lon. Each row will be displayed as a points or circles at that latitude and longitude.

**Data for Australian standard regions:** RaPP map allows you to display data on the map for Australian standard regions using a CSV file with rows for each region name. Spreadsheets where each row refers to a region such as a local government area (council), state, postcode, or ABS statistical unit such as an SA2 or CED (Commonwealth Electoral Division) can be displayed on the map. Columns must be named according to the CSV-geo-au standard <u>https://github.com/TerriaJS/nationalmap/wiki/csv-geo-au</u>. Each row will be displayed as a region, highlighting the actual shape of each area.

## 5.8.2 My polygons

You can use vector polygons or points with analysis tools in RaPP Map. The analysis tools allow you to assess trends over time in Total Vegetation Cover for your area of interest (see section 6 Analysis tools).

The analysis on the Total Vegetation Cover Monthly or 8 day data from MODIS. This time series analysis is not available for any other data layers at this stage.

If you have a polygon in a compatible format follow the steps at 5.8.1 to upload.

If you do not have a polygon but you know the area that you would like to use for analysis there are many ways to create a polygon that you can use in RaPP Map.

Will you need to repeat your analysis, save your polygon, or use elsewhere?

- No create a point or polygon in RaPP Map see 6.1.
- Yes create and export your polygon using another tool.

RaPP map can accept outputs from most Geographic Information System (GIS) Software such as ArcGIS, QGIS, Google earth etc. If you do not have access to these software you can explore online tools.

This example uses a free online tool that to create a GeoJSON which you can extract for use in other programs such as RaPP. Please note that we do not encourage or endorse the use of this tool over any other tool or suggest that these outputs will meet your needs.

1) Go to an online tool for example <u>https://geojson.io/#map=2/20.0/0.0</u>

2) Find your area of interest. You can use the search tool in the top right corner to search for a location name. You can click Satellite in the bottom left corner to locate areas using satellite imagery.

3) Click Draw a polygon button

4) Click on the corners of the area of interest to see connected lines appearing, click again on the first point to finish creating a polygon. You can also use Draw a rectangular button to "draw a rectangular" polygon and "Draw a marker" button to draw a point





4) Once you have created the polygon (or point), click Save on the top ribbon and save as kml or GeoJSON file. (Advantage of GeoJSON file is when it dropped into the Rapp map it will add as a layer with opacity feature where you can set the transparency to see the underneath layer)

5) Open Rapp map and add your polygon (See section 5.8).

#### 5.8.3 Other web services

You can add any web mapping services from online mapping applications sites.

Web data formats able to be loaded into Rapp map can include Web Map Service (WMS) Server, Web Feature Server (WFS), Esri ArcGIS Server, Esri ArcGIS Map Server, Esri ArcGIS Feature Server, 3D Tiles, Open Street Map Server, GeoJSON, KML or KMZ, CSV, Web Map Tile Service (WMTS) Server, Carto, CZML, GPX, GeoRSS, Shapefile (zip), Web Processing Service (WPS) Server, SDMX-JSON, Opendatasoft Portal and Socrata Server.

If the web services layer contains polygon layers (e.g. Boundary layers), they can be used in the analysis. However, raster tiles layers be only used for contextual purposes. They cannot be used for analysis.

For Example, if you want to add Catchment scale land use of Australia 2020 to view the primary land use classes in your target area copy the URL

<u>https://www.environment.gov.au/mapping/rest/services/abares/CLUM\_50m/MapServer</u> (You can also get this URL from the website <u>https://www.agriculture.gov.au/abares/data/web-mapping-services#web-services-list</u>)

- 1. Click Explore Map data or Upload. Then select My Data tab.
- 2. Click Add Web Data
- 3. Paste the URL you have copied in the Step 2 text box. Click Add.

Add web data	
Step 1: Select file type (optional)	
Auto-detect (recommended)	
e.g. http://data.gov.au/geoserver/wms Add	

Figure 39: Step 2 text box to enter the URL of Web map services

4. Click the drop down arrow button next to the data layer name "Catchment Scale Land Use of Australia – Update December 2020" from the left side window. Now you can see the different types of data layers

5. Click the plus button next to the data layer "Catchment Scale Land Use 2020 – Primary Classification" to load the data to the Map Viewer. As this is a raster type data layer you can only use this for contextual purposes.



Figure 40: Load the Catchment Scale Land Use 2020 -Primary Classification layer to the Map viewer

# 6. Analysis tools

The Analysis tools provide time-series analysis for the area of interest (selected points or polygons) of Fractional and Total Vegetation cover types (MODIS, 500 m) from Jan 2001 to current. To use analysis tools, click Explore map data and select Analysis Tools (Figure 41).

SEOGLAM RAPP	Interiesh (	A.	D B B B B B B B B B B B B B B B B B B B	a la
Q. Search for locations	Global Australia Regional Reports	Analy	sis Tools My Data	Done
Explore map data	Q Search whole catalogue		Analysis Tools	< Share
DATA SETS (3)	Mean for point or region (Monthly)	llide	Description	
Place Labels	Mean for point or region (8-day)	libh	The Analysis Tools provide time-series data	a for selected points (pixels)
Coastlines / Borders / Roads	Proportion of region within a Total Vegetation Cover range (Monthly)	llhh	or regions (polygons).	
Total Vegetation Cover (PV+NPV,     Monthly)	Proportion of region within a Total Vegetation Cover range (8-day)	<u>lthi</u>	The "Mean for point or region" function retu vegetation fractional cover fractions and pro or pixel.	urns the mean value for the ecipitation for a given region
Q IDEAL ZOOM ABOUT DATA			The "Proportion of region within a Total Ve function returns the proportion of a given re Vegetation Cover that you can select.	getation Cover range" egion within a range of Total

Figure 41 Analysis Tools

Analysis tools offer more flexibility than the regional reports, as you can analyse timeseries patterns of Total Vegetation Cover for your custom polygons or points.

There are four types of time series analysis tools available (Figure 41)

- Mean for point or region (Monthly)
- Mean for point or region (8-day)
- Proportion of region within a Total Vegetation Cover range (Monthly)
- Proportion of region within a Total Vegetation Cover range (Monthly)

For more information about these tools see 6.2 for Mean for point or region and 6.3 for Proportion of region within a Total Vegetation Cover range.

The Proportion of region within a Total Vegetation Cover range analysis tool is based on the same concept as the Frequency of total vegetation cover data which can be found in the data catalogue window, Australia, Vegetation Cover (MODIS, 500m), Summaries (section 6.4.2). However, the analysis tool enables you to set your own threshold values and to perform time series analysis for your own points or polygons. See Section 6.3 for more information.

## 6.1 Analysis tool geometry inputs

## (YouTube video link 6)

Time series analysis can be performed using a vector geometry point or polygon. You can either use an inbuilt polygon dataset from the Rapp tool, use your own prepared point or polygon files or you can draw one. Figure 42 shows the Analysis tool window with the choice of three Geometry inputs; Point (lat/lon), Polygon, and existing polygon.

Global Australia Regional Reports	Anal	alysis Tools My Data Done
<ul> <li>Q Search whole catalogue</li> <li>Mean for point or region (Monthly)</li> <li>Mean for point or region (8-day)</li> <li>Proportion of region within a Total Vegetation Cover range (Monthly)</li> <li>Proportion of region within a Total Vegetation Cover range (8-day)</li> </ul>		Tou can provide the name of the polygon or pixel. You can click on a point, draw a polygon or select a polygon already displayed in the screen. The output is a graph and the data can be downloaded as a csv file. Point/Polygon name Polygon1 Geometry (required) Select Location
		Point (lat/lon) Polygon Existing Polygon
		NRM_2017.15
		Run Analysis

Figure 42 Analysis geometry inputs

To use an inbuilt polygon dataset layer for analysis:

- 1. Load a polygon layer
  - Click Explore map data, select Australia, select a polygon dataset layer and add it to the map view. For example expand boundaries, cadastre, click + to add QLD cadastral parcels
  - o Navigate to the polygon of interest in the map view
- 2. Hide other layers (6.2)
- 3. Open analysis tools (Explore map data, Analysis tools tab)
- 4. Select the analysis tool you want to use (See section 6.2 and 6.3)
- 5. Select Existing polygon
- 6. Select a single polygon from the polygon layer displayed in the RaPP map view
- 7. Check the polygon ID has been added from the Existing polygon layer to the grey box below the Existing Polygon
- 8. Enter a Point / polygon name. This will be the label shown on the chart in RaPP and CSV file.
- 9. Click Run Analysis

#### Use your own prepared point or polygon files

- 1. Drag and drop your file into RaPP map (See sections 5.8.1 and 5.8.2).
- 2. Hide other layers
- 3. Open analysis tools (Explore map data, Analysis tools tab)
- 4. Select the analysis tool you want to use (See section 6.2 and 6.3)
- 5. Select Existing polygon
- 6. Select a single polygon from the polygon layer displayed in the RaPP map view to analyse and run the analysis.

Draw a new Point (Lat/Lon) or Polygon.

- 1. Hide other layers to see the base map (or other context needed to locate your area of interest)
- 2. Navigate to your area of interest (section 4.2)

- 3. Open Analysis tool (Explore map data, Analysis tools tab)
- 4. Click point or polygon This will take you to the map screen.
- 5. For a point, click on the map to select a pixel/point.
- 6. For a hand-drawn polygon, Click on the map to select the starting point of the polygon. Click at each vertex. Click again the starting point to finish the polygon. Click done to close the pop-up drawing window,

See the 6.2 and 6.3 for more details about each analysis function.

#### 6.2 Mean for point or region

You can display the time series (monthly and 8-day data) of the mean Fractional and Total vegetation cover with rainfall of an area. Fractional cover includes green cover, non-green cover and bare ground. Total vegetation cover is green+non-green.

Mean values can be useful for small areas to summarise the vegetation cover. However, mean values can be misleading and hide variation especially over large areas or time spans. We suggest spatial Total vegetation cover averages are appropriate for areas less than 1 square kilometre depending on the complexity of the landscape. Creating a target based on the average Total vegetation cover from a time series is also problematic because the target will fail half of the time. This is because the mean has roughly half the values above and half below it. Mean values can also be skewed by outlier values.



Figure 43 Chart from analysis of monthly fractional cover mean for Corangamite NRM region Victoria

## Mean for point or region (Monthly)

This function returns the mean value for the monthly vegetation fractional cover fractions and precipitation for a given region or pixel.

To use this function,

- 1) Go to Explore map data, select Analysis Tools. Click Mean for point or region (Monthly).
- 2) Select the area of interest (See Section 5.8)
- 3) Once the polygon is selected, type name of polygon into Point/Polygon name box
- 4) Click Run Analysis in blue bar on bottom of Analysis Tools page

The results are loaded as:

- Layers into the workbench(navigation pane)
  - $\circ$  Click off/on the layers to display what is required on the graph
  - Tip switching off rainfall (click on blue "prec" square button) makes it easier to see other layers and changes the graph display width
- As a graph on the bottom of the map screen. Hover over the graph to see the change in fractional cover types over the time
- Whatever layers are displayed on the graph can be downloaded as a csv file.
- Click Download on top right hand corner of graph. CSV file is downloaded to your Downloads directory

#### Mean for point or region (8-day)

This function returns the mean value for the 8-day Fractional and Total vegetation cover with precipitation for a given region or pixel

To use this function,

1) Go to Explore map data, select Analysis Tools. Click Mean for point or region (8-day) and follow the same steps as above (2 - 4).

## 6.3 Proportion of region within a Total Vegetation Cover Range

This function returns the proportion of a given region within a range of Total Vegetation Cover (for monthly and 8-days). Total cover is the sum of green and non-green cover.

#### Proportion of region within a Total Vegetation Cover range (Monthly)

To use this function

1) Go to Explore map data, select Analysis Tools. *Click Proportion of region within a Total Vegetation Cover range (Monthly)*.

2) Select the area of interest (See Section 5.8)

3) Once the polygon is selected, type name of polygon into *Point/Polygon name* box

4) Provide the lower and upper limits of total vegetation cover and click Run Analysis.

5) The output is added as a layer into the workbench (navigation) pane graph and the data can be downloaded as a csv file.

#### Proportion of region within a Total Vegetation Cover range (Monthly)

To use this function

1) Go to Explore map data, select Analysis Tools. *Click Proportion of region within a Total Vegetation Cover range (8-days)* and follow the same steps as above (2-5).

#### Why do analysis tools take a long time to run?

This could be due to the size of the polygon/ polygons you are using. Bigger the polygon the analysis will take more time. Try using smaller polygons to run the tools.

Note: The Regional Reports of comprehensive description of the vegetation cover condition for the most recent month on record for the NRM regions and the LGA Areas of Australia can be found in the Regional Reports tab (See Section 7 for more information).

## 6.4 Analysis tool outputs

The output of each analysis is a graph or chart. In RaPP Map the colours of the chart series are fixed. Total vegetation Cover (TVC) white, Photosynthetic Vegetation (PV) Green, Non-photosynthetic vegetation (NPV) dark blue, Bare ground is Red and Precipitation is light blue. While you can display charts from multiple analyses in RaPP Map it can be difficult to distinguish results from other points or polygons. For this reason you may prefer to download the results from each analysis as a CSV file by pressing download on the top right of the chart in RaPP map after each analysis.

The CSV file will be labelled with the Polygon/Polygon name you entered (figure 42).

Please ensure to record the details of the analysis you have run such as which analysis tool was selected and which thresholds were chosen as none of these details are recorded in the csv file.

Remove or hide charts or series from RaPP map view using the workbench legend.

# 7. Reports

## 7.1 Regional reports on RaPP

#### (YouTube video link 7)

Regional reports display maps and statistics for monthly ground cover reporting and target setting. Reports have been run for Natural Resource Management regions and Local Government areas. Reports are discoverable in RaPP map using the Regional Reports tab from the data catalogue window. Reports are also published on the Report finder website <a href="https://eo-data.csiro.au/">https://eo-data.csiro.au/</a>. Regional reports are prepared both for each entire region and separated by land use and forest cover. The Report finder is useful for finding reports from a particular time period, or for a specific land use and cover class.

To find the report for your NRM (natural resource management) region:

- 1) Click *Explore map data* and select Regional Reports from the Data catalogue top ribbon
- 2) Click + symbol to the right of the NRM Regions Reports (Australia). The layer will load in the main screen.
- 3) Click the NRM region for which you want to view the report. A popup window opens allowing you to preview the most recent monthly report available for this region.
- 4) If you want to download the report or data use the several links (above the displayed report) that take you to a directory with the:
  - PDF of the report
  - Reports from previous months
  - The CSV file with the data that is in the reports

To find the report for your LGA (local government area) follow the steps for adding NRM regions except Click + symbol to the right of the LGA Regions Reports (Australia).

## 7.2 Regional report finder

Regional reports are also published on the Report finder website <u>https://eo-data.csiro.au/</u>. The Report finder is useful for finding reports from a particular time period, or for a specific land use and cover class. You can access the report finder by:

- Preview a report in RaPP map (7.1) and click the second link: Reports for previous months for this region available in <u>this link</u>, or
- Navigate directly to https://eo-data.csiro.au/ in your web browser
  - o Select the tab for NRM or LGA regional reports

The regional report finder page will appear as at figure 44

Home				
Monthly reports for LGA regions				
Please note that reports for the regions that have area more than 5000 Search and select your region, land use forest cover type and date of your choice:	sq km are only available			
search region		÷		
Conservation and natural environments	Conservation and natural environments - Non-forest	Conservation and natural environments - Woodland forest		
Conservation and natural environments - Non- woodland forest	Agriculture	Grazing		
Grazing - Non-forest	Grazing woodland forest	Grazing Non-woodland forest		
Cropping	Horticulture	Irrigation		
Production native forests and plantation forests	Entire Region	Area Table		
Please select year and month				

Figure 44. Regional report finder for Local Government Areas

To choose a report

- 1. Select a region from the dropdown list
- 2. Select a land use and forest cover class from the coloured boxes
- 3. Select a year and month
- 4. Click submit
- 5. The report finder will return a PDF report.

Note that reports are not generated for land use and forest cover classes that are less than 2 percent of the area of the region.

## 8. Share, print and Story

#### (YouTube video link 8)

#### 8.1 Share

You can share the custom views of the map you created by simply clicking on Share/ Print button at the top right corner of the Map Viewer.

There are three ways to share your the RaPP Map view with others:

 Click the Share button, copy the given URL (shown in the first text box) to the clipboard and paste it into an email which you send to the recipient. They can click on it in the email or paste it into their browser to see the same view as you. Note: Copying the URL will preserve the data layers, zoom levels when opened by other users. If local files are added to the map, the share link will not include those • Click the Share button, click Advances options, copy the HTML fragment and paste it into an HTML file, which you then make available to the recipients. When the recipients display your web page, they will see the RaPP Map view within that web page.

Note: This will show the data you have loaded from a local file. To share a view of your data with others, you must first publish it to the web somewhere with a URL, and then load it from there.

• Take a screenshot and email it as an image (see your OS instructions on how to take a screenshot). This will share all information, even if loaded from a local file or URL.

## 8.2 Print

Click Download map (png) to download the map in .png format. You can also check the print view before downloading by clicking the show print view.

## 8.3 Story

You can create simple animations using the Story functionality by adding different data layers, changing the zoom levels etc. at different stages of the Story. Once completed, Stories can be shared following the steps under Share / Print feature.

## 8.4 Export

Export is not currently working and will be fixed in the next Terria update.

The Export function enables you to download a GeoTIFF of a single time period from the Total Vegetation Cover for a custom extent that you select from the RaPP Map view. Click on the three vertical dots and then the Export tool.

Export - download a Geotiff of the area shown on the map



Figure 42: Exporting the display as a Geotiff image

The window Figure 43 appears. Click on the map twice to draw the rectangle. Then click Download Extent.

**Click two points to draw a retangle extent.** *Click to add a point* 

**Download Extent** 

Figure 43: Download extent

# 9. Troubleshooting

Q. Why do my Analysis tools run slowly?

Make sure you have turn on the 2D base map settings.

Q. Why is my map loading slower than before?

This could be due to the out of memory. Clear the cache and try again.

Q. Why am I seeing a "Network error" when I try to load some data layers?

This could be due to server maintenance. Please try again sometime later. If the issue persists, check your firewall restrictions.

Q. Why do "3D Terrain" and "3D Smooth" Perspective Views look the same on my computer?

Some older computers do not have graphics cards which fully support WebGL and some older browsers do not make use of this support even if it is present. The TerriaMap requires this support in order to support 3D Terrain Perspective View.Try upgrading your browser to the latest version. If that still does not work, you may need to consider working on a computer that has more recent graphics support.

## 10. Feedback

You can send feedback directly from the map, by clicking on the Feedback button in the Map Viewer (bottom right) or email geoglam.rapp@csiro.au.