Urban Heat and Tree Mapping Viewer

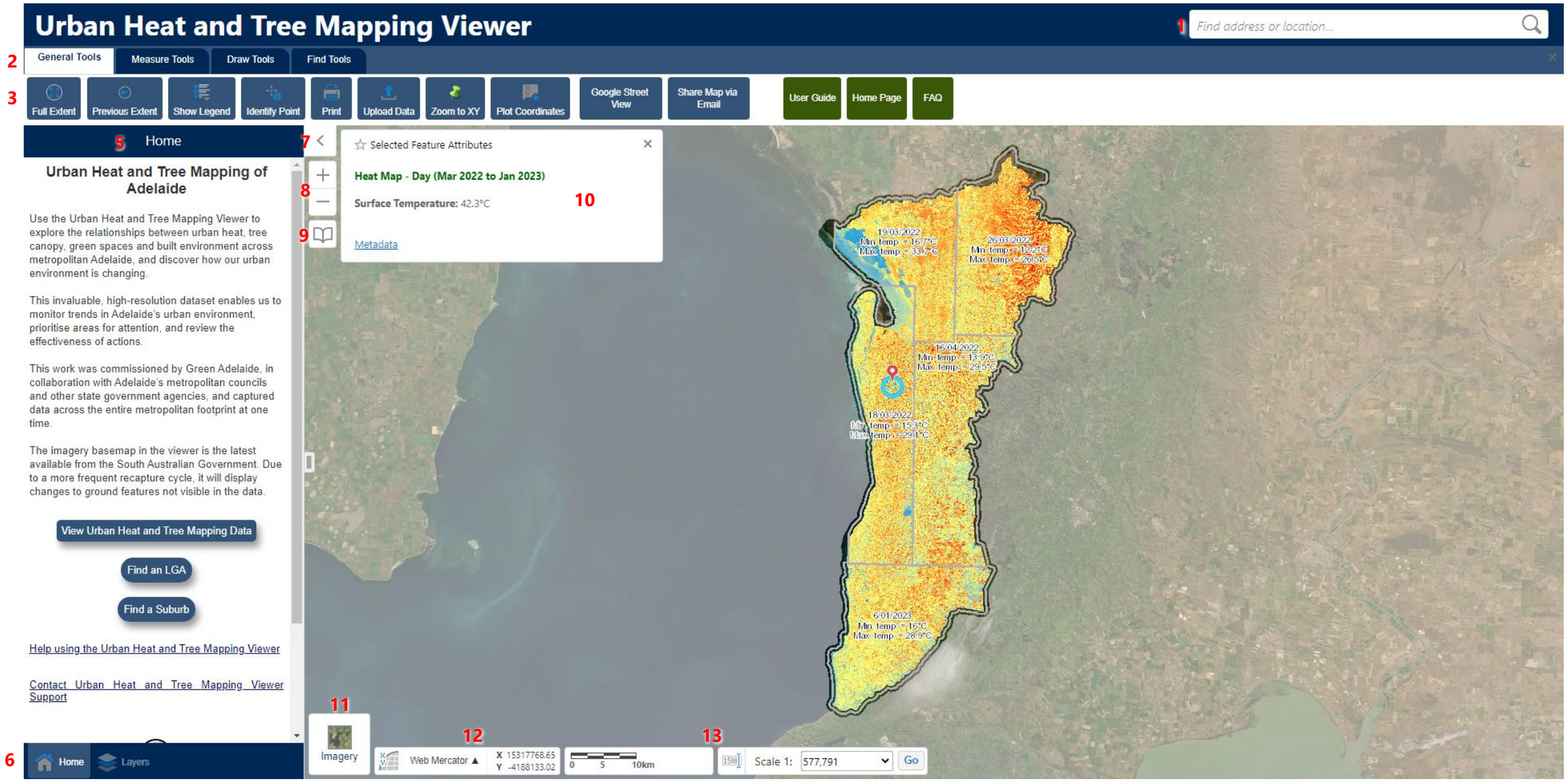
Quick start guide

Version 3.0

Government of South Australia
Department for Environment and Water

Contents

Viewer layout



1 **Address or location search:** type an address or a location to search on	8 **Zoom buttons:** zoom in or out using the + or - buttons
2 **Toolbar tabs:** tools are grouped by function. Select the tab to display the required tools	9 **Bookmark:** create or open a bookmark
3 **Toolbar:** contains the tools that interact with the map or perform a specific function	10 **Map tip:** information about the feature pops up in this box when you left click (mouse) on a feature
4 **Show / hide toolbar icon:** shows or hides the toolbar when you click the icon	11 **Base maps:** select a base map from either aerial imagery, a topographic map or a street map
5 **Home / Layers panel:** the Home panel provides some quick find tools and useful links. The Layer panel provides list of layers in the viewer	12 **Coordinate display:** select the coordinate system to display the data and coordinates
6 **Panel tabs:** displays a tab for each open panel. Click the tab to swap between the different panels e.g. Home, Layer, Results	13 **Scale bar and map scale:** use the dropdown to zoom quickly between map scales
7 **Show / hide panel icon:** shows or hides the panels when you click the icon	

Navigating around the map

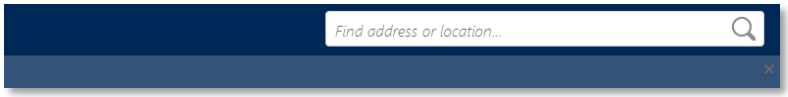
You can navigate around the map using the mouse, a keyboard or a combination of both. Use the table below as a guide:

To...	Do this...
Pan or move the map	Click and hold the left mouse button and drag the map in any direction.
Move the map left or right	Press the **Left** or **Right** arrow keys on the keyboard.
Move the map up or down	Press the **Up** or **Down** arrow keys on the keyboard.
Zoom in or out	Scroll the **mouse wheel** away from you to zoom in, or towards you to zoom out. *OR*: Click the **Plus +** or **Minus –** map tools to zoom in or out. *OR*: On the keyboard, press the **Plus +** key to zoom in, or press the **Minus -** key to zoom out.
Zoom in to a specific region on the map	Press and hold the **SHIFT** key, hold down the left mouse button and drag a **rectangle** around the area you want to zoom in to.

If you're using a touch screen, touch a spot on the map and move your finger to move the map around. Double tap or pinch outwards to zoom in. Pinch inwards to zoom out.

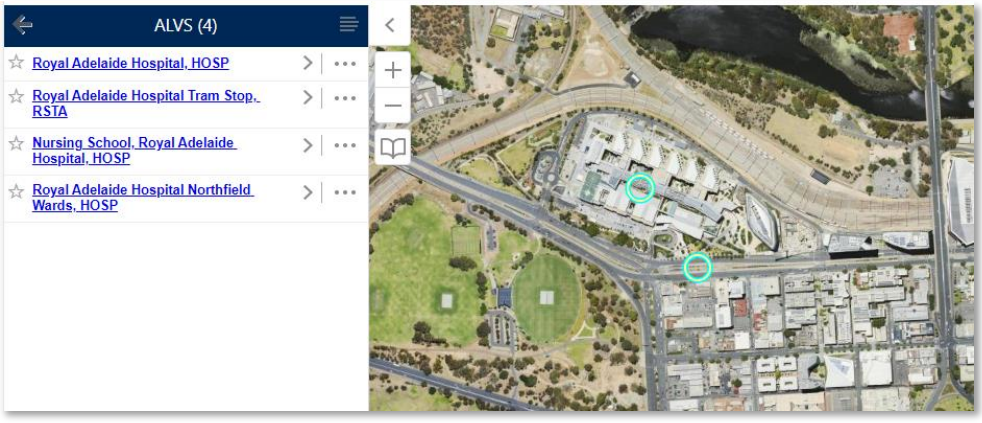
Find an address or location

The viewer uses the Address Validation Service from Location SA to enable you to search for street addresses or gazetted locations within South Australia.



To find a specific address, type the address you wish to find in the search box and click on the magnifying glass, or press Enter on your keyboard.

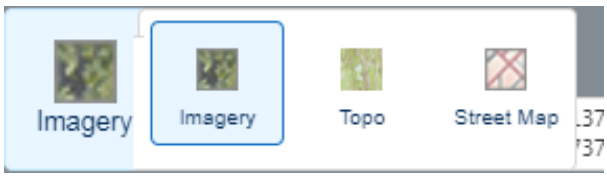
The closest search results are returned in the left-hand side panel. Select a search result to zoom to that location.



Selecting a base map

Use the base map menu in the bottom left of the map view to choose a base map. There are 3 base maps to choose from:

- **Imagery (default)** – contains the South Australian government's latest aerial photography.
- **Topo** – the topographic base map replicates the appearance of a traditional paper-based topographic map, and contains roads, tracks, towns, vegetation, water features and contours. Extra detail will appear as you zoom in.
- **Street Map** – contains a "street directory" type base map.

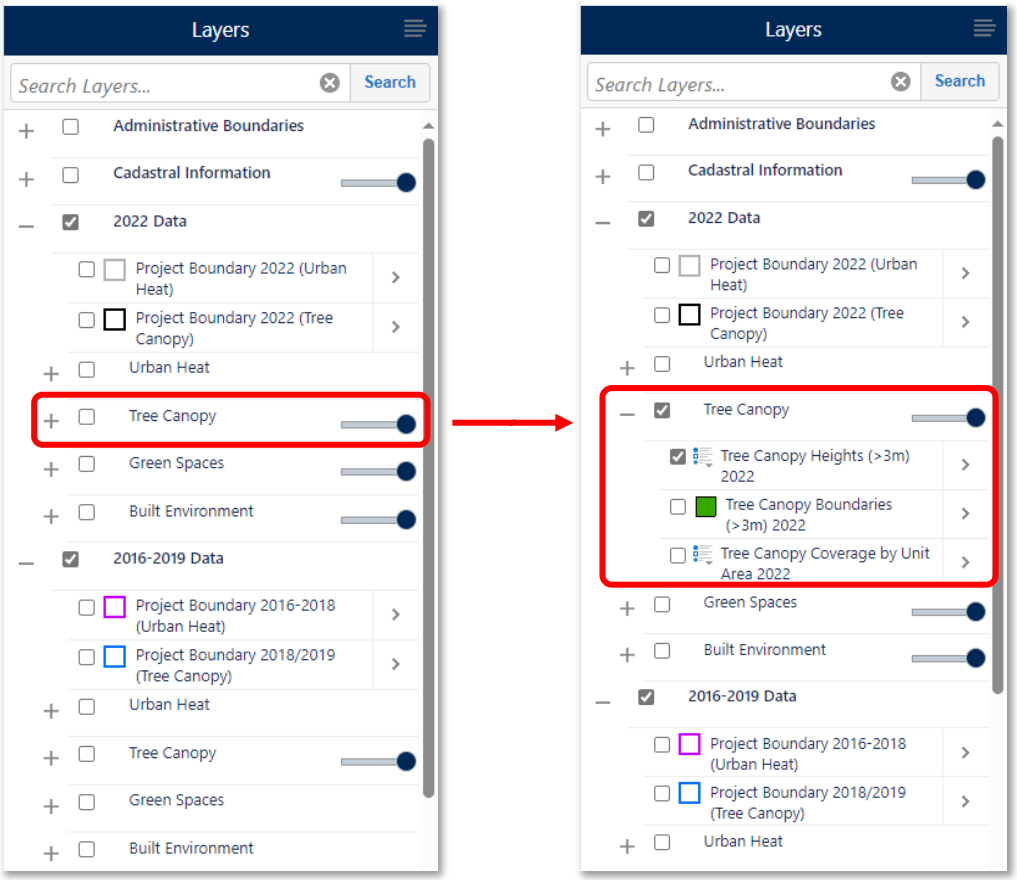


Layers panel

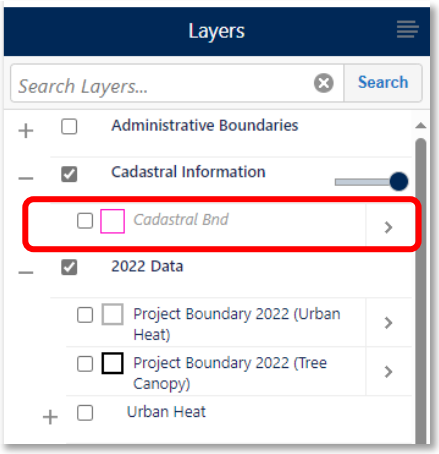
The Layers Panel shows a list of all the layers available in the viewer. From here you can turn layers on and off in the map.

When you first open the Layer panel, you'll be presented with the top-level folders. To expand the folder, click on the + next to the folder name, and check the box to activate the folder.

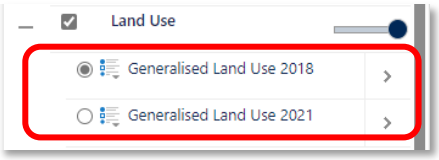
To turn a layer on, click the check box next to the layer name.



If a layer name is greyed out and italic, this means that it has a scale dependency. You will be able to "check it on" but it won't become active until you have zoomed to the appropriate scale.

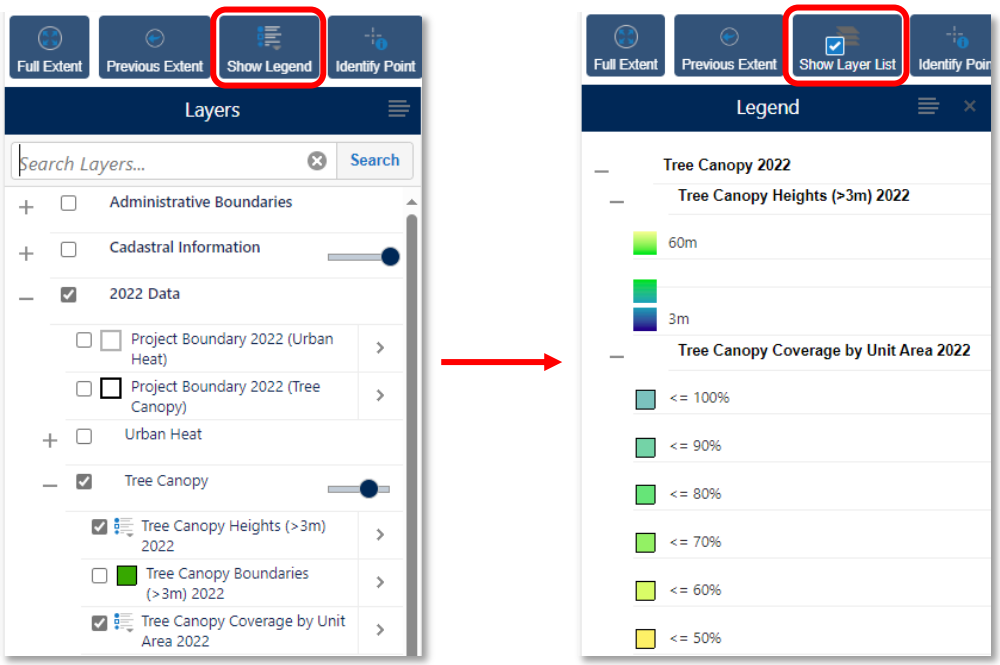


Certain folders in the viewer only allow one layer in that folder can be activated at a time. This is indicated by a circle check option ○ . Once a layer is activated under these folders, toggle between the layers to see other features. You will need to uncheck the folder itself to turn off the layer.



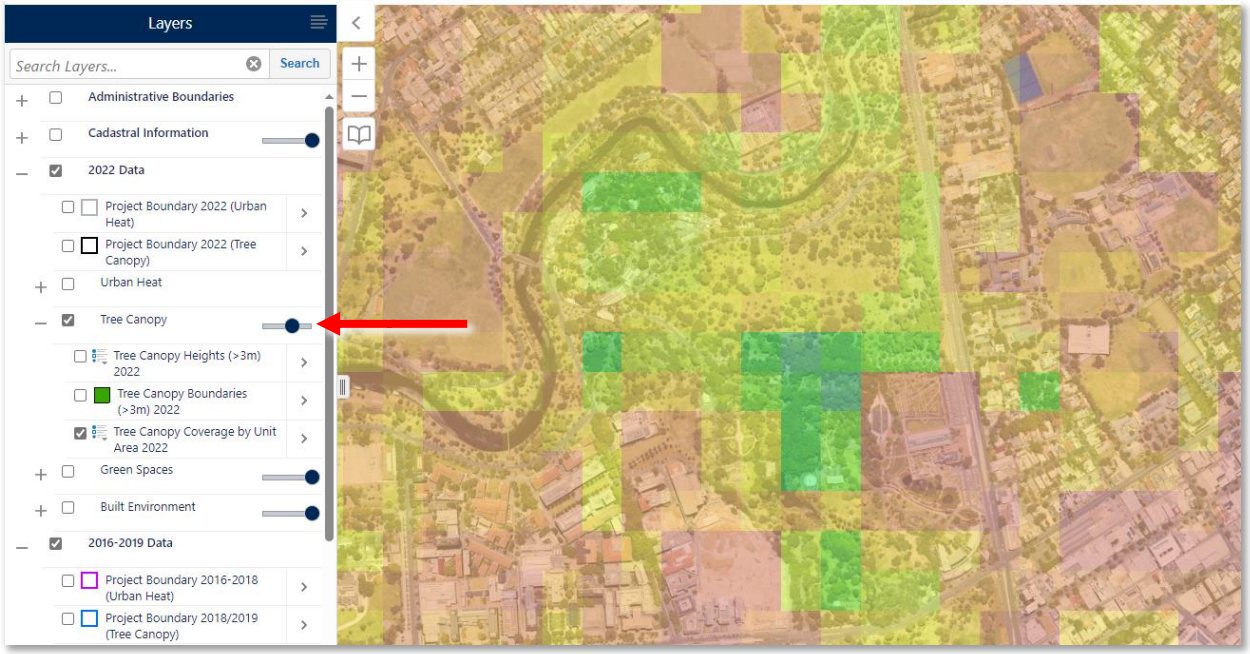
Show legend

Click on the Show Legend button (on the General Tools tab) to turn on / off the legend of the active layers to see further details about the symbolisation.



Transparency slider

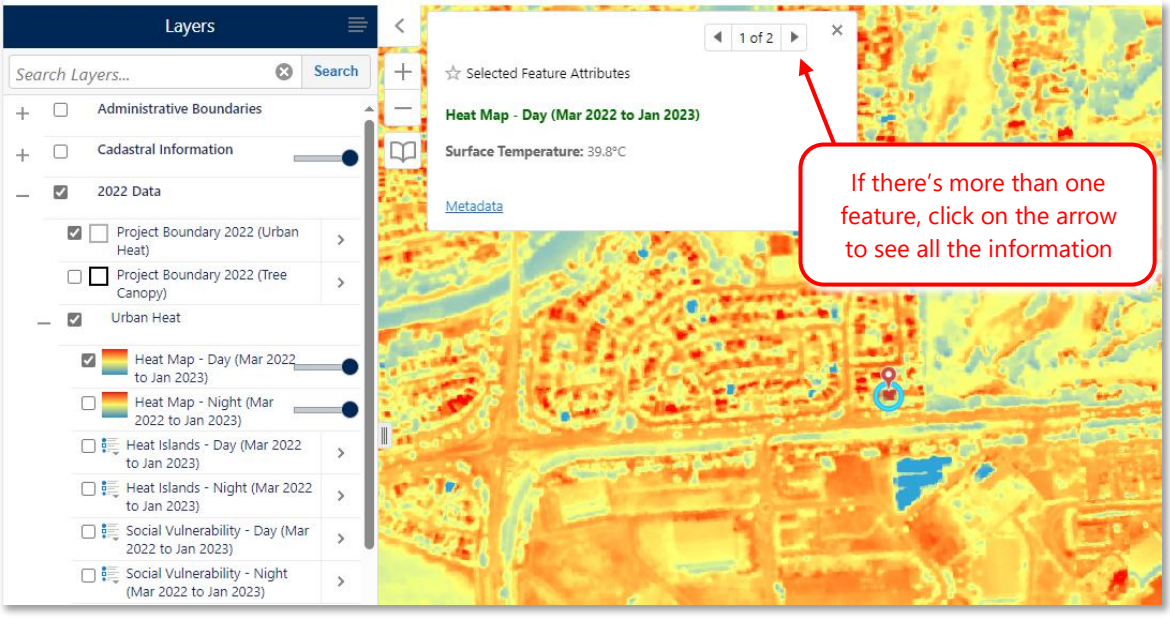
The transparency slider allows you to adjust the transparency of ***all*** layers under that folder in order to see the base map information underneath.



Identify

Some layers allow you to click on them to identify more information about the data.

To identify a feature in the map, click the left mouse button to activate the Map Tips function and see a brief description of that feature.



Right click menu

Right click the mouse button at any point on the map to find information about that location and perform a number of actions.

1 Address information (where available) for that location.	**5** Add some text at that location.
2 Coordinates at that location. Change coordinate display by selecting the coordinate system option at the bottom of the screen.	**6** Centres the map screen to that location.
3 Draw a point at that location.	**7** Zooms screen to the initial start-up extent.
4 Plot coordinates for that location.	**8** Displays imagery information (capture date and resolution) at that location. Note: please ensure that imagery base map is activated.

Google Street View

The Google Street View tool opens an integrated interactive panel to Google Street view. It provides a useful on-ground view of trees and the surrounding landscape.

Open Google Street View using the button on the General Tools toolbar.

When the integrated Google Street View is open, the viewer's map displays a marker that indicates the location of the Google Street View.

Drag the marker on the map to update the Google Street View. *Note: you need to ensure the marker is on a road in order to return street view data.*

You can pan and zoom the viewer and Google Street View maps independently of each other by using the standard map controls for panning and zooming. When you pan or move around in the Google Street View map, the marker on the viewer will update to indicate the location and direction of the Google Street View.

1 Viewpoint indicator: shows the location marker that is used in the viewer. The viewpoint indicator is for information only – it is not clickable.
2 Centre map: moves the location marker to the centre of the viewer and rescales Google Street View to match.
3 Synchronise maps: allows you to automatically synchronise the map viewer and the Google Street View, so that navigating within Google Street View will update and centre the map viewer, and vice versa.
4 Open in new window: allows you to dock and undock the Google Street View map from the viewer and open it in a new tab or window. *Note: tablets and smart phones do not support the undocking function.*
5 View on Google Maps: opens Google Maps directly at the select location; from here you can select 'See more dates' to see historical Street View imagery.

Data descriptions

2022 data

Layer	Description	Technical report	Metadata
Project boundary 2022 (urban heat)	This dataset represents the project boundary of the 2022 metropolitan Adelaide urban heat mapping project, for which thermal data was captured. It also defines individual thermal data capture extents within the project boundary.	Access here	Access here
Project boundary 2022 (tree canopy)	This dataset represents the project boundary of the 2022 metropolitan Adelaide tree canopy mapping project, for which LiDAR data and multispectral satellite imagery was captured.	Access here	Access here
Urban heat			
Heat map day / night (Mar 2022 to Jan 2023)	This dataset contains 2m resolution thermal imagery representing the distribution of urban heat both during the day and at night across metropolitan Adelaide. Data was captured over 5 days and nights – on the 18 March 2022 (centre-west extent), 19 March 2022 (north-west extent), 26 March 2022 (north-east extent), 16 April 2022 (centre-east extent) and 6 January 2023 (southern extent). Daytime flights commenced at approximately 12pm and nighttime flights commenced at approximately 11pm, and each took approximately 4 hours. Temperatures relate to land surface temperature (LST) rather than air temperature.	Access here	Access here
Heat islands day / night (Mar 2022 to Jan 2023)	This dataset represents urban heat islands both during the day and night across metropolitan Adelaide. Airborne thermal data was captured over 5 days and nights - 4 between March and April 2022 and another in January 2023. Urban heat islands in this dataset are large areas (125m resolution) which are significantly hotter than the surrounding landscape, and are defined as either high (2-3°C above the mean LST), severe (> 3°C but < 4°C above the mean LST) or extreme (> 4°C above the mean LST).	Access here	Access here
Social vulnerability day / night (Mar 2022 to Jan 2023)	This dataset represents the distribution of urban heat islands (derived from airborne thermal data) in relation to vulnerable members of the community. It combines urban heat islands with a social vulnerability index (SVI) based on information from the 2021 census. Airborne thermal data was captured over 5 days and nights - 4 between March and April 2022 and another in January 2023.	Access here	Access here

Tree canopy			
Tree canopy heights (>3m) 2022	This dataset is a canopy height model representing the vertical height of tree canopy cover across metropolitan Adelaide and was derived from LiDAR data captured in January 2022. The canopy height model has a spatial resolution of 0.5m and defines a tree as any vegetation 3m in height or greater. Any vegetation less than 3m is not included.	Access here	Access here
Tree canopy boundaries (>3m) 2022	This dataset represents the horizontal extent of tree canopy cover across metropolitan Adelaide and was derived from LiDAR data captured in January 2022. The data has a spatial resolution of 0.5m and defines a tree as any vegetation 3m in height or greater. Any vegetation less than 3m is not included.	Access here	Access here
Tree canopy coverage by unit area 2022	This dataset represents the percentage of tree canopy cover across metropolitan Adelaide in 2022 within a 100m x 100m grid. The percentage is calculated from a canopy height model derived from LiDAR data captured over metropolitan Adelaide in January 2022. Trees are defined as any vegetation 3m in height or greater. Any vegetation less than 3m is not included.	Access here	Access here
Green spaces			
Green spaces 2022	This dataset represents the extent of green spaces across metropolitan Adelaide and was generated from an artificial intelligence / machine learning (AI/ML) methodology based on multispectral imagery captured between January and February 2022. This dataset has a spatial resolution of 0.5m and defines green spaces as all actively growing vegetation such as trees, shrubs and grass regardless of height.	Access here	Access here
Vegetation greenness NDVI 2022	This dataset is a normalised difference vegetation index (NDVI) representing vegetation 'greenness' across metropolitan Adelaide. It is based on multispectral satellite imagery captured between January and February 2022 and has a spatial resolution of 0.5m.	NA	Access here
Built environment			
Building footprints 2022	This dataset represents the horizontal extent of building footprints across metropolitan Adelaide and was derived from LiDAR data captured in January 2022. The data has a spatial resolution of 0.5m and buildings are defined based on the classified point cloud.	Access here	Access here
Permeable vs impermeable surfaces 2022	This dataset represents the extent of permeable and impermeable surfaces across metropolitan Adelaide and was generated from an artificial intelligence / machine learning (AI/ML) methodology based on multispectral imagery captured between January and February 2022 and LiDAR data captured in January 2022. This dataset has a spatial resolution of 0.5m. Permeable surfaces include bare ground, grass and trees/vegetation not overhanging impermeable surfaces. Impermeable surfaces include pavements, concrete, roads and carparks, and buildings and trees overhanging impermeable surfaces. Water is captured as a separate class and includes all natural and artificial water bodies, streams and swimming pools.	Access here	Access here

2016-2019 data

Layer	Description	Technical report	Metadata
Project boundary 2016-2018 (urban heat)	This dataset represents the project boundaries of three urban heat mapping projects undertaken between 2016-2018 across metropolitan Adelaide. The projects were undertaken in 2016 by Resilient South, in 2017 by Adapt West and in 2018 by Resilient East and City of Salisbury.	Access here (2018), here (2017) and here (2016)	Access here
Project boundary 2018/2019 (tree canopy)	This dataset represents the project boundary of the 2018/2019 metropolitan Adelaide tree canopy mapping project, for which LiDAR data was captured. LiDAR data captured in April 2018 covers the entirety of the following metropolitan Adelaide local government areas: Adelaide, Burnside, Charles Sturt, Holdfast Bay, Marion, Norwood Payneham and St Peters, Port Adelaide Enfield, Prospect, Tea Tree Gully, Unley, Walkerville and West Torrens; as well as parts of Campbelltown, Gawler, Mitcham, Onkaparinga, Playford and Salisbury. The remainder of Campbelltown, Mitcham, Onkaparinga and Salisbury were captured between October to November 2019. Playford and Gawler remained partially captured.	Access here	Access here
Urban heat			
Heat map day / night (10th Mar 2018; 9th Feb 2017; 22nd Feb 2016)	This dataset contains 2m resolution thermal imagery representing the distribution of urban heat both during the day and at night across metropolitan Adelaide. Data was captured for three different projects on the 10 March 2018 (Resilient East and City of Salisbury), 9 February 2017 (Adapt West) and 22 February 2016 (Resilient South). Daytime flights commenced at approximately 11am and nighttime flights commenced at approximately 11pm, and each took approximately 4 hours. Temperatures relate to land surface temperature (LST) rather than air temperature.	Access here (2018), here (2017) and here (2016)	Access here (2018), here (2017) and here (2016)
Heat islands day / night (10th Mar 2018; 9th Feb 2017)	This dataset represents urban heat islands both during the day and night across metropolitan Adelaide. Airborne thermal data was captured for three different projects on the 10 March 2018 (Resilient East and City of Salisbury), 9 February 2017 (Adapt West) and 22 February 2016 (Resilient South). Urban heat islands in this dataset are large areas (125m resolution) which are significantly hotter than the surrounding landscape, and are defined as either high (2-3°C above the mean LST), severe (> 3°C but < 4°C above the mean LST) or extreme (> 4°C above the mean LST).	Access here (2018) and here (2017)	Access here (2018) and here (2017)
Social vulnerability day / night (10th Mar 2018; 9th Feb 2017)	This dataset represents the distribution of urban heat islands (derived from airborne thermal data) in relation to vulnerable members of the community. It combines urban heat islands with a social vulnerability index (SVI) based on information from the 2016 census. Airborne thermal data was captured for three different projects on the 10 March 2018 (Resilient East and City of Salisbury), 9 February 2017 (Adapt West) and 22 February 2016 (Resilient South).	Access here (2018) and here (2017)	Access here (2018) and here (2017)

Tree canopy			
Tree canopy heights (>3m) 2018/2019	This dataset is a canopy height model representing the vertical height of tree canopy cover across metropolitan Adelaide and was derived from LiDAR data captured in April 2018 and October to November 2019. The canopy height model has a spatial resolution of 0.5m and defines a tree as any vegetation 3m in height or greater. Any vegetation less than 3m is not included.	Access here	Access here
Tree canopy boundaries (>3m) 2018/2019	This dataset is a canopy height model representing the horizontal extent of tree canopy cover across metropolitan Adelaide and was derived from LiDAR data captured in April 2018 and October to November 2019. The canopy height model has a spatial resolution of 0.5m and defines a tree as any vegetation 3m in height or greater. Any vegetation less than 3m is not included.	Access here	Access here
Tree canopy coverage by unit area 2018/2019	This dataset represents the percentage of tree canopy cover across metropolitan Adelaide in 2018 and 2019 within a 100m x 100m grid. The percentage is calculated from a canopy height model derived from LiDAR data captured over metropolitan Adelaide in April 2018 and October to November 2019. Trees are defined as any vegetation 3m in height or greater. Any vegetation less than 3m is not included.	Access here	Access here
Green spaces			
Vegetation greenness NDVI Sep 2018	This dataset is a normalised difference vegetation index (NDVI) representing vegetation 'greenness' across metropolitan Adelaide. It is based on multispectral satellite imagery captured in September 2018 at 7.5 cm resolution. The NDVI was calculated at a spatial resolution of 20cm.	NA	Access here
Built environment			
Building footprints 2018/2019	This dataset represents the horizontal extent of building footprints across metropolitan Adelaide and was derived from LiDAR data captured in April 2018 and October to November 2019. The data has a spatial resolution of 0.3m and buildings are defined based on the classified point cloud.	Access here	Access here
Permeable vs impermeable surfaces 2018/2019	This dataset represents the extent of permeable and impermeable surfaces across metropolitan Adelaide and was generated using an object-based image analysis (using multispectral imagery and LiDAR data), combined with a rule-based classification (using vector datasets). This dataset has a spatial resolution of 0.5m. Permeable surfaces include bare ground, grass and trees/vegetation above 25cm not overhanging roads. Impermeable surfaces include pavements, concrete, roads, carparks, and buildings and trees/vegetation above 25cm overhanging roads. Water is captured as a separate class and includes all natural and artificial water bodies, streams and swimming pools.	Access here	Access here

Change detection data

Layer	Description	Technical report	Metadata
Tree canopy extent change 2018/2019 to 2022	This dataset represents the change in tree canopy cover across metropolitan Adelaide between 2018-2019 and 2022. Canopy cover is calculated from a canopy height model derived from LiDAR data captured over metropolitan Adelaide in April 2018 and October to November 2019, and again in January 2022. The change between the two canopy cover datasets is calculated on a pixel-by-pixel basis, and then classified into one of the following classes: canopy gain, tree canopy loss, no change and unclassified. Trees are defined as any vegetation 3m in height or greater. Any vegetation less than 3m is not included.	Access here	Access here
Canopy coverage by unit area 2018/2019 to 2022	This dataset represents the change in percentage of tree canopy cover across metropolitan Adelaide between 2018-2019 and 2022 within a 100m x 100m grid. Canopy cover is calculated from a canopy height model derived from LiDAR data captured over metropolitan Adelaide in April 2018 and October to November 2019, and again in January 2022. The change is calculated as the percentage in each grid cell in 2018 subtracted from the percentage in the corresponding grid cell in 2022. A zero value indicates no change, a negative value indicates a reduction in the percentage of tree canopy cover and a positive value indicates an increase in percentage of tree canopy cover. Trees are defined as any vegetation 3m in height or greater. Any vegetation less than 3m is not included.	Access here	Access here
Building footprints change 2018/2019 to 2022	This dataset represents the change in building footprints across metropolitan Adelaide between 2018-2019 and 2022. Building footprints are derived from a LiDAR classified point cloud captured over metropolitan Adelaide in April 2018 and October to November 2019, and again in January 2022. The change between the two building footprint datasets is calculated on a pixel-by-pixel basis, and then classified into one of the following classes: increase, decrease, no change and unclassified.	Access here	Access here

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