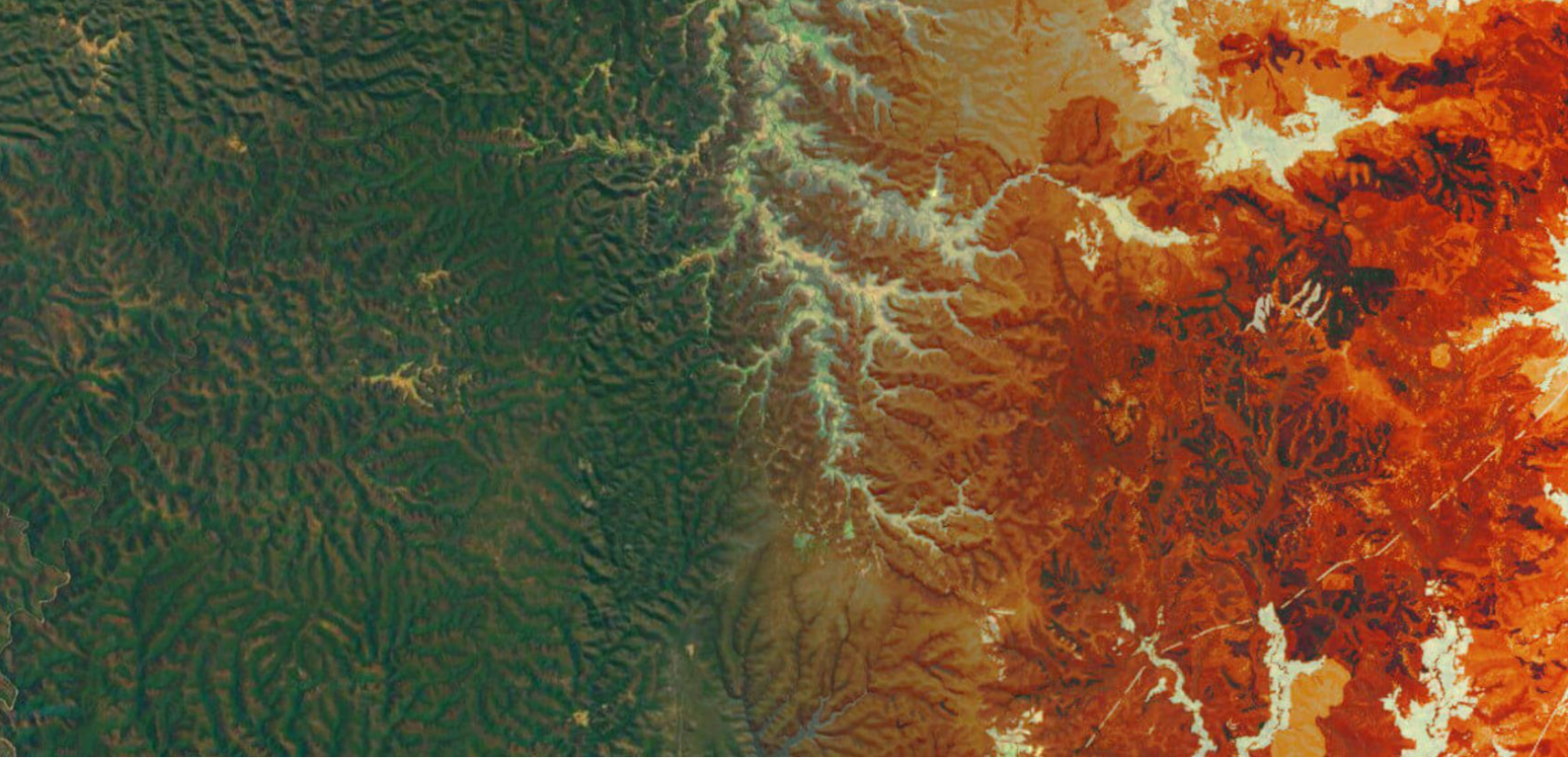
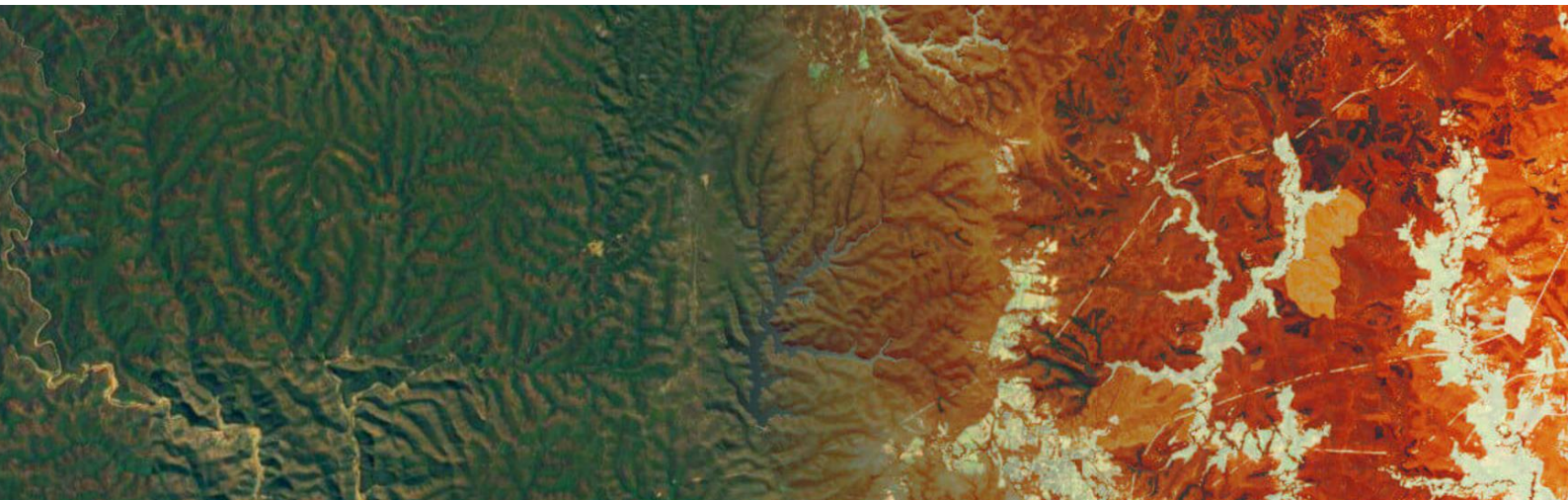


HANDS-ON TRAINING

NSW Imagery Hub

Training material for webinar conducted on Tuesday 6th February 2024



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About

Document information

This document has been prepared by NGIS on behalf of NSW DCCEEW EHG Spatial Imagery Team, last updated 5/02/2024.

This document has been prepared with all due diligence and care, based on the best available information at the time of publication. The Department holds no responsibility for any errors or omissions within this document. Information contained in this document is from several sources and, as such, does not necessarily represent Government or departmental policy.

This document has been created for the webinar on Tuesday 6th February 2024. The recording of the webinar will be available after the event on the Planet for NSW Government on Vimeo: https://vimeo.com/channels/dpespatialimagery

Contact details

For all queries, please contact: spatial.imagery@environment.nsw.gov.au

Acknowledgement

We acknowledge and pay our respect to the traditional custodians of the lands and waters of Australia, and all Aboriginal Elders past and present. We respectfully acknowledge the traditional custodians of the land and waters of Australia, and their continuing cultural, spiritual customs and practices.

About the NSW Imagery Hub

State-wide high-resolution imagery plays an ever-greater role in the way NSW Government can plan, prepare, and coordinate response and recovery efforts to disaster events and monitor NSW's environment and biodiversity. The NSW Imagery Hub provides NSW State Government Agencies and Local Government access to timely remotely sensed satellite imagery across the entirety of NSW. The Hub, run by the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) Remote Sensing & Landscape Science Spatial Imagery Team, NGIS, and Planet Labs PBC, supports natural hazard programs across NSW Government including monitoring fire, drought and flood events, recovery and rehabilitation. The Hub provides an easy-to-use platform with the capability to monitor natural hazards using near-daily high-resolution satellite imagery (3.7m resolution), an archive of time series imagery, and very high resolution on demand (0.5m resolution). The Hub is complemented by NSW Science Economics & Insights (SEI) team of expert remote sensing staff, partnered with NGIS and Planet Labs PBC providing support and training to NSW Government.

Outcomes of the NSW Imagery Hub:

- Secure, manage, process, and distribute satellite imagery on a fast reliable platform to all NSW Government agencies including Local Government.
- Provide Planet high resolution (30-50cm) satellite imagery on demand across NSW.
- Enable desktop assessment with the availability of Planet daily imagery (3.7m) for effective management of resources and assist with mitigating risk that can occur with field visits, especially during and after fires and during flooding events.
- Ensuring coordinated access to remote sensing technologies and imagery for natural hazards and other environmental programs, and understanding long term impacts and changes in the landscape.

What's included in the NSW Imagery Hub?

The NSW DCCEEW Spatial Imagery Services team procure, curate and deliver a range of imagery and ancillary datasets for use in research, planning, monitoring and emergency response. The products currently included in the NSW Imagery Hub (as of 5/02/2024):

1. PlanetScope 3.7m near-**daily** NSW monitoring and archive online view, and online timelapse tools (online Explorer & plugin visuals)
2. PlanetScope 3.7m **monthly** NSW basemap web services (WMTS)
3. PlanetScope 3.7m & SPOT 1.5m downloaded imagery (GeoTIFF 8-band scenes) available on request, contact: Spatial.imagery@environment.nsw.gov.au
4. SkySat 0.5m tasking (WMTS and 4-band GeoTIFF scenes) available on request, contact: Spatial.imagery@environment.nsw.gov.au
5. SkySat 0.5m Basemap of Greater Sydney, including Normalized Surface Reflectance (WMTS and 4-band GeoTIFF mosaic tiles), captured between 1 Dec 2023 - 13 Jan 2024
6. Other ancillary datasets available on demand, contact: Spatial.imagery@environment.nsw.gov.au. More products coming soon.

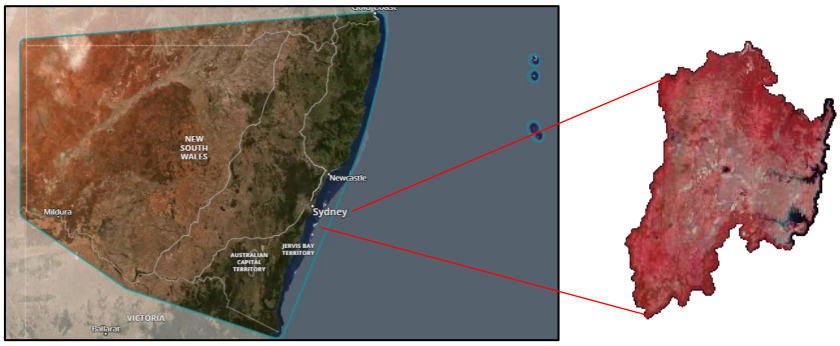


Figure 1: Imagery items available in NSW State (relating to products 1 and 2 above), and Greater Sydney Basemap (product 5).

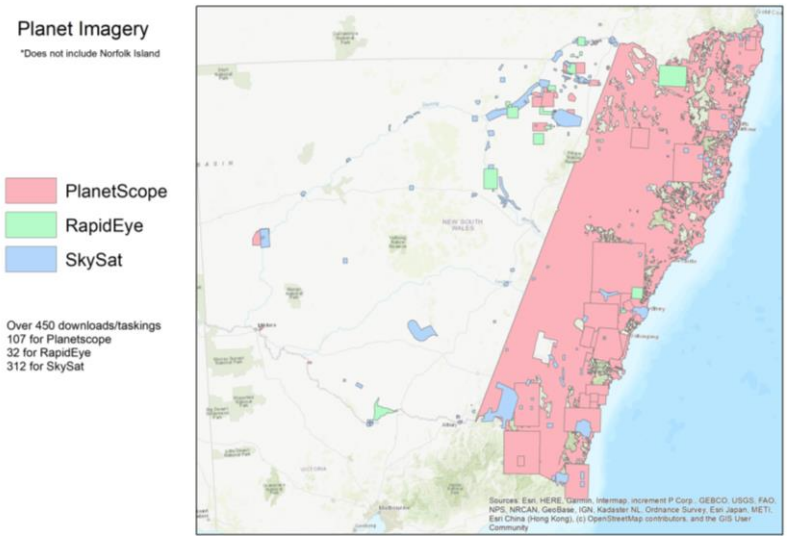


Figure 2: Downloaded GeoTIFF imagery available (relating to above products 3, 4, 6), contact: Spatial.imagery@environment.nsw.gov.au.

Overview

This tutorial will detail the following steps to use the tools and imagery available in the NSW Imagery Hub:

1. Getting Account & Logging in to Explorer
2. Finding API key & navigating user profile
3. Searching images & filtering including cloud cover
4. Session sharing
5. Snapshot tool
6. Compare and differ tool
7. Stories
8. Basemaps
9. Next steps

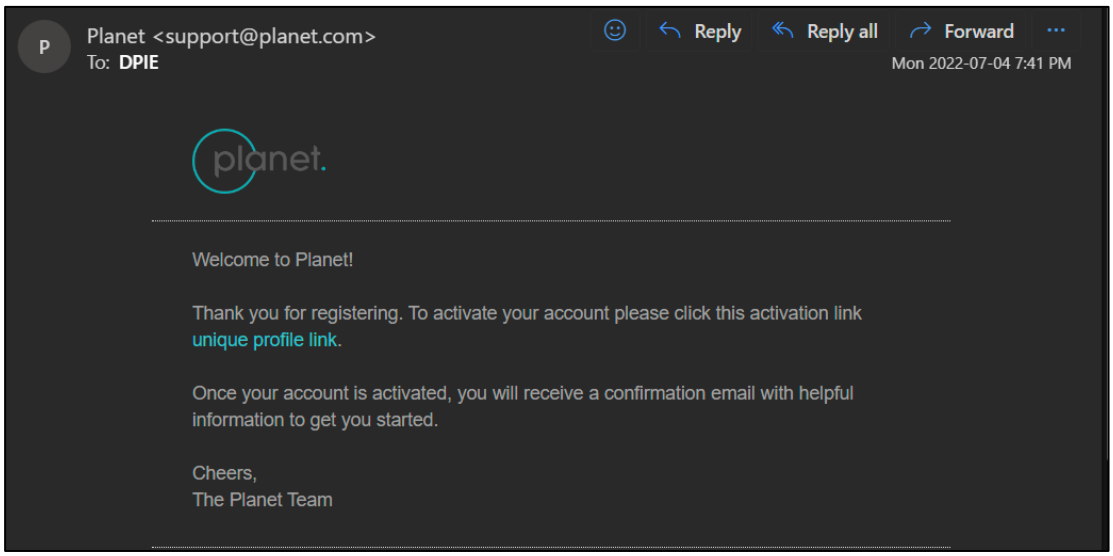
1. Getting Account & Logging in to Explorer

Please have your account username and password ready. If you do not have an account please see instructions below to acquire a new account:

1.1 Create a new account

a. To use Planet Labs PBC satellite imagery, an account is required. Request access by contacting: Spatial.imagery@environment.nsw.gov.au.

b. You will receive an email within 48 hours from support@planet.com or no-reply@planet.com to set up your account using your email address. Please check your junk and trash for activation emails.



c. You will be required to create a password. The password can be reset at any time by navigating to: https://account.planet.com/signin/forgot-password

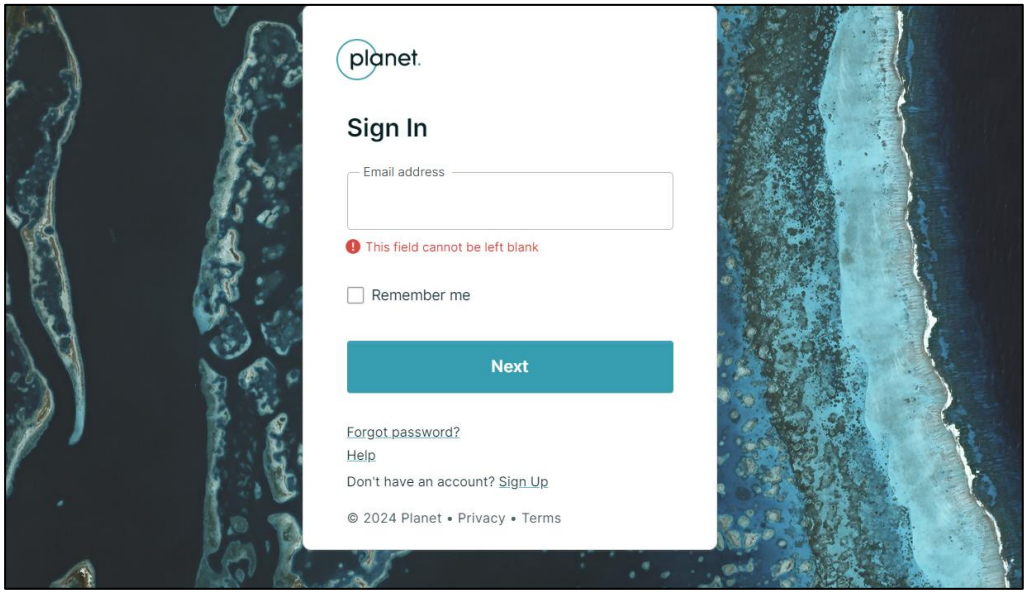
d. If you have any issues with account set-up, please contact: Spatial.imagery@environment.nsw.gov.au.

This account will provide access to applicable Planet website applications, including: Planet Explorer, Planet Stories, Basemaps Viewer, product integrations in QGIS and ArcGIS Pro, and web services for Basemaps API, and Tiles API, and your account page.

We will explore some of these applications in the following instructions.

1.2 Login to Explorer with your account information

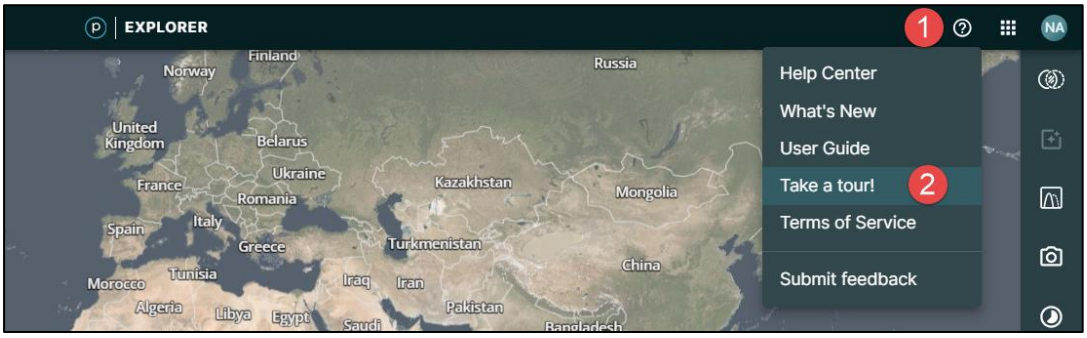
a. Navigate to https://www.planet.com/explorer/ to login, enter your email and password.



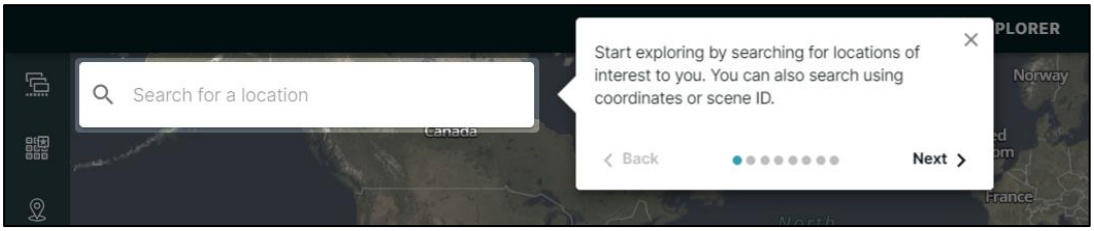
1.3 If you are new to the Explorer interface, "Take a tour!" to see a quick overview.

a. The Tour will automatically start if it is your first time in the Explorer interface.

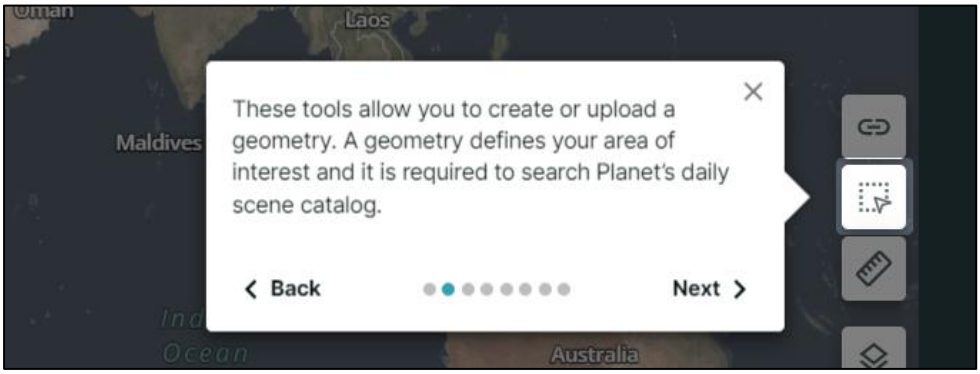
b. If you want to take the tour again, click on the question mark icon "?" on the top right of the screen. Then select "Take a tour!":



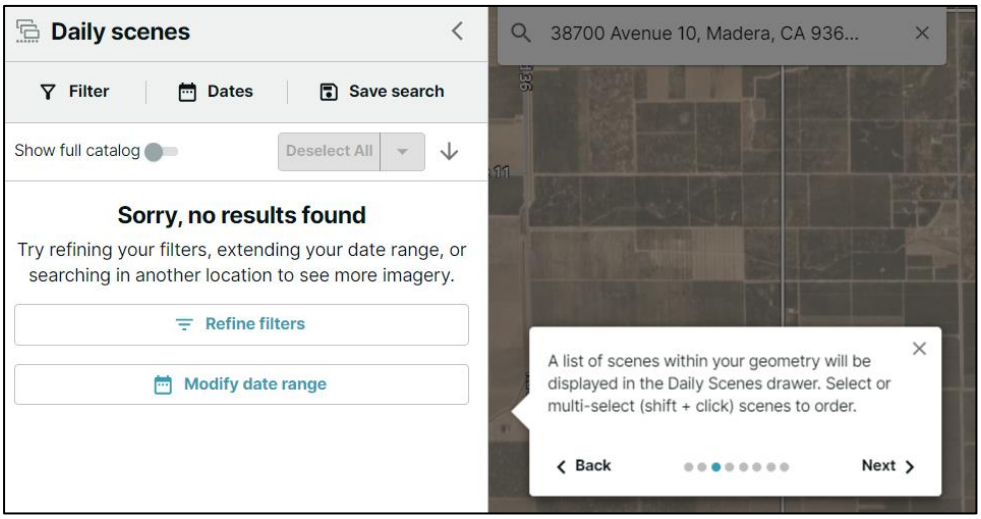
The tour will highlight the main functionality in the Planet Explorer interface, starting with the search bar.



c. Click next to see an overview of the upload tools



d. Click next to see an overview of the daily search panel.



e. Click the "x" to exit the tour.

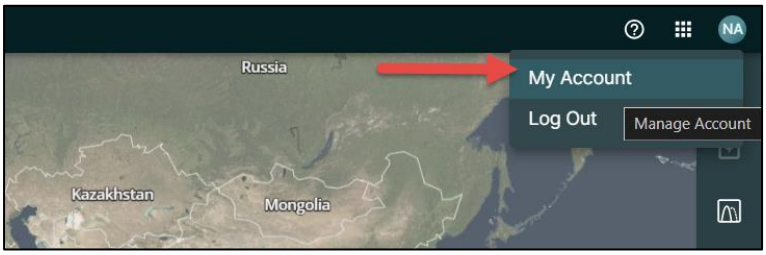
2. Finding API key & navigating user profile

2.1 Navigate to your account page

a. Select the Account icon in the top right corner to manage your account.

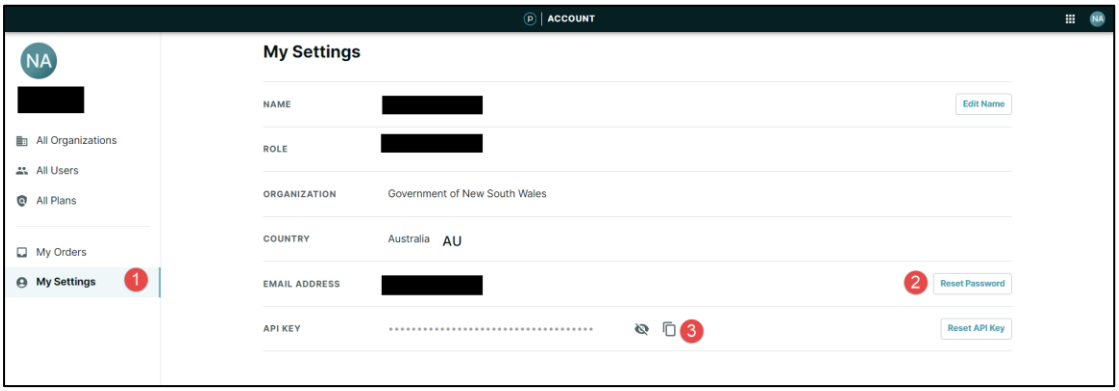
The account icon displays dropdown options to navigate to the Planet Account page or to Log Out.

b. Select “My Account”



From your Planet account page, view personal account settings, update your name, change the password, and view the usage of your accounts.

c. Select “My Settings” to update your settings and copy your API key.

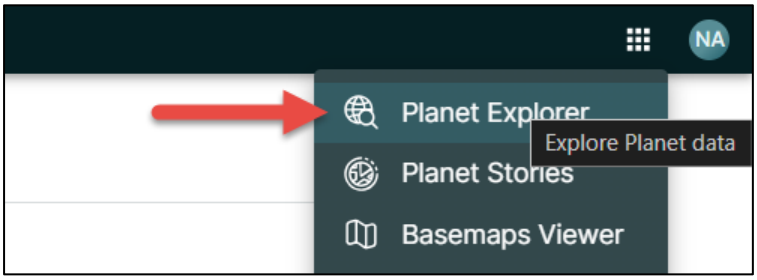


This location provides you with a button to reset your password.

You can copy your API Key from the bottom of this page. This is required for using Planet’s Basemaps and Tiles API.

The authentication process for using Planet APIs is Basic HTTP Authentication. For the service to transmit data to you, it requires credentials, a key, before you can access this data. API keys are available to all registered users with active Planet accounts.

d. Return to Planet Explorer by clicking on the application icon, and selecting “Planet Explorer”

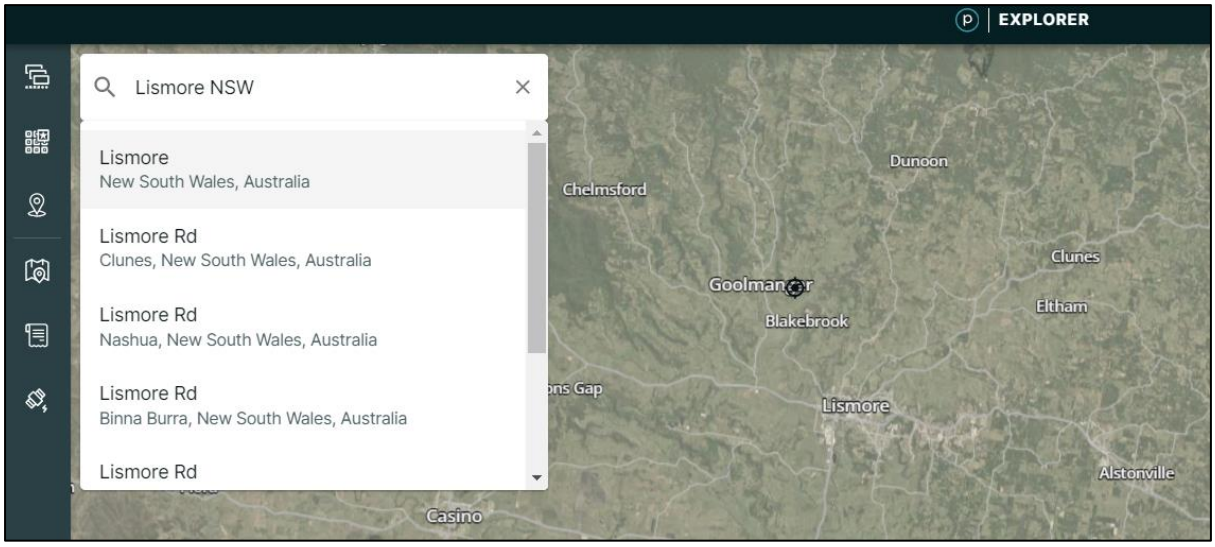


3. Searching images & filtering including cloud cover

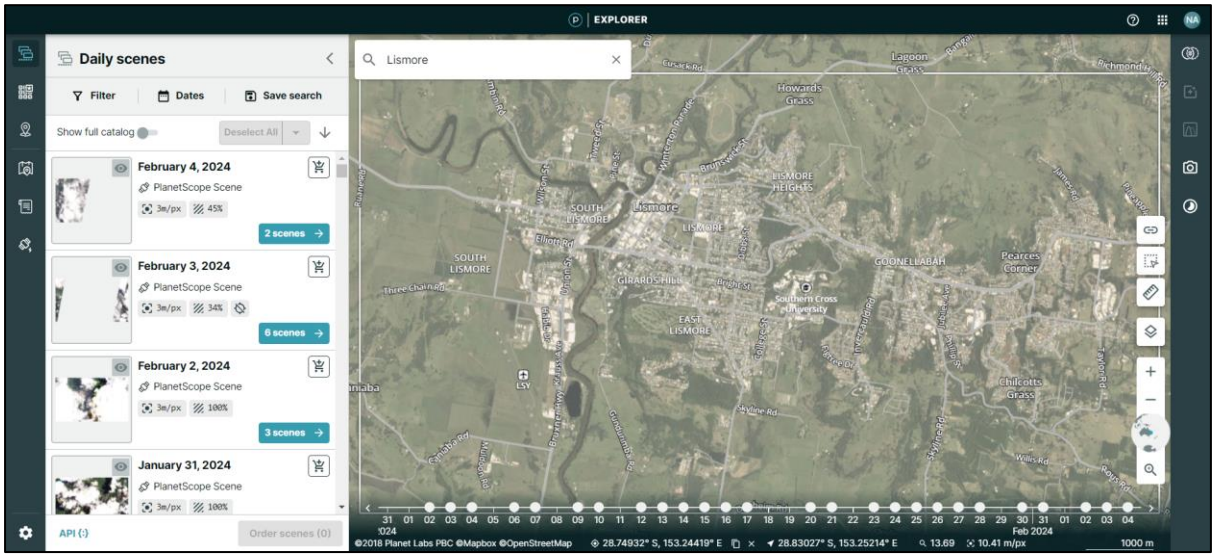
3.1 Use the search bar¶

You can search for any location or a specific area of interest (AOI) by using the search box located at the top left of the page.

a. Navigate to the Search bar in the top left. Type a location address in the Search Bar. We've used the example of Lismore, NSW. You can enter your own location or coordinates.



b. The map view zooms to that location and a bounding box appears in the map. After you have a bounding box drawn, the search results appear in a panel on the left side of the page.



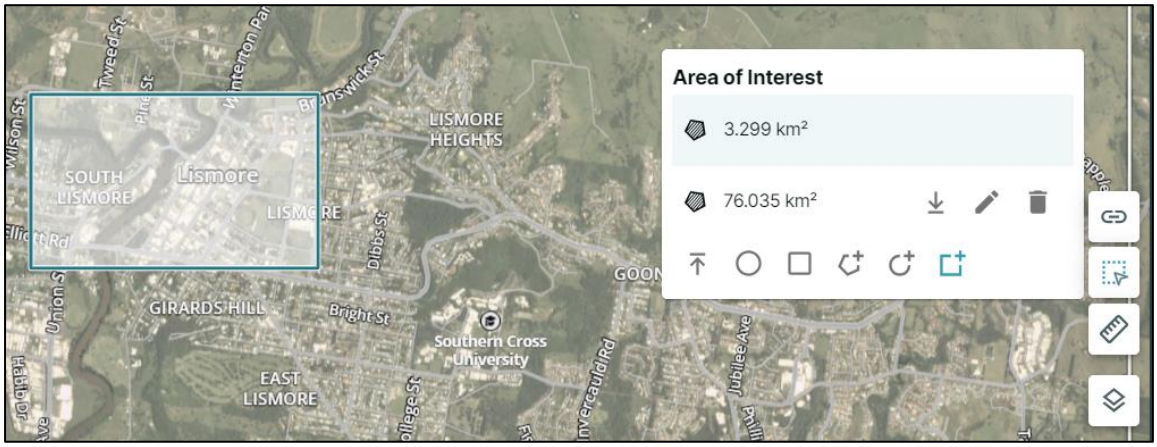
3.2 Create a custom Area of Interest (AOI) on the map¶

You can search for imagery by specifying a custom area on the map, either by drawing a geometry or uploading a geospatial file. Supported file types include shapefile, GeoJSON, JSON, Keyhole Markup Language (KML), Well Known Text (WKT), GPX, DBF, SHX, PRJ, and ZIP files.

a. Navigate to the map tools available on the middle right of the page. Find the “Draw or upload an area of interest” icon to view to see the options to draw or upload a geometry.

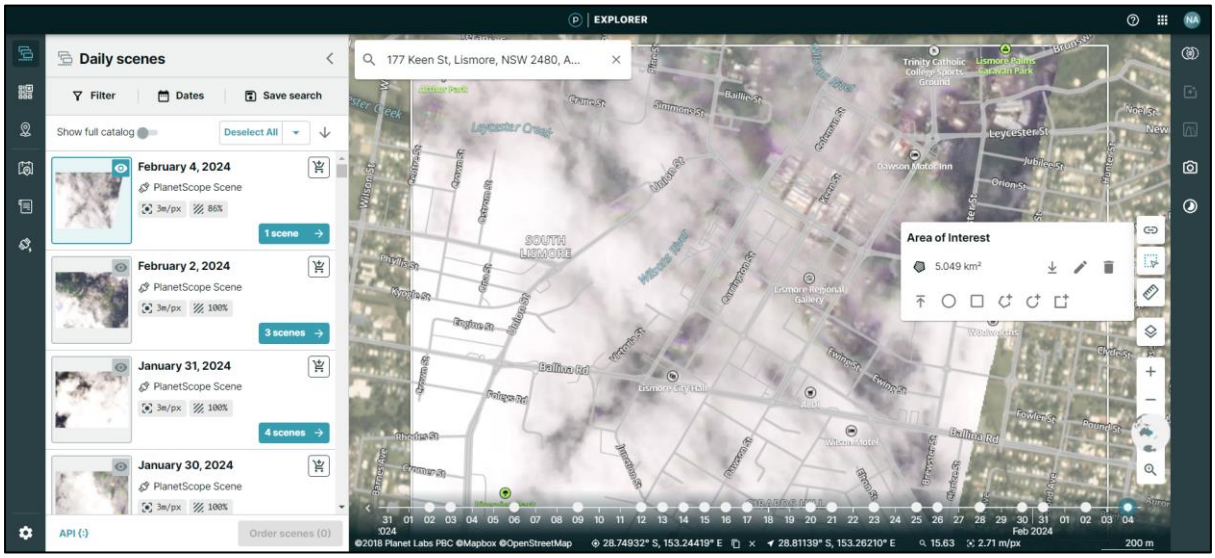
b. Click the tool to view the options menu to create an AOI. Try out one of the options. The following tools are available:

- File importer uploads a geospatial file into Planet Explorer. Click the Upload Tool to open a file system browser window and navigate to your file. You can upload more than one file to Planet Explorer, but if multiple polygons are found, Planet Explorer automatically simplifies the shape of your geometry. Supported file types include shapefile, GeoJSON, JSON, Keyhole Markup Language (KML), Well Known Text (WKT), GPX, DBF, SHX, PRJ, and ZIP files.
- Constrained Circular AOI draws a circle with a maximum area of 50,000 square kilometers. The area varies by the latitude of the center coordinate.
- Constrained Rectangular AOI draws a rectangle with a maximum area of 50,000 square kilometers. The area varies by the latitude of the center coordinate.
- Custom AOI draws a polygon of your choice.
- Circular AOI draws a circle of any size.
- Rectangular AOI draws a rectangle of any size.



You will notice that the area of your AOI in square kilometers is highlighted, and you can click on the pencil to edit, trash can to delete the AOI, and the arrow to download the file as a GeoJSON.

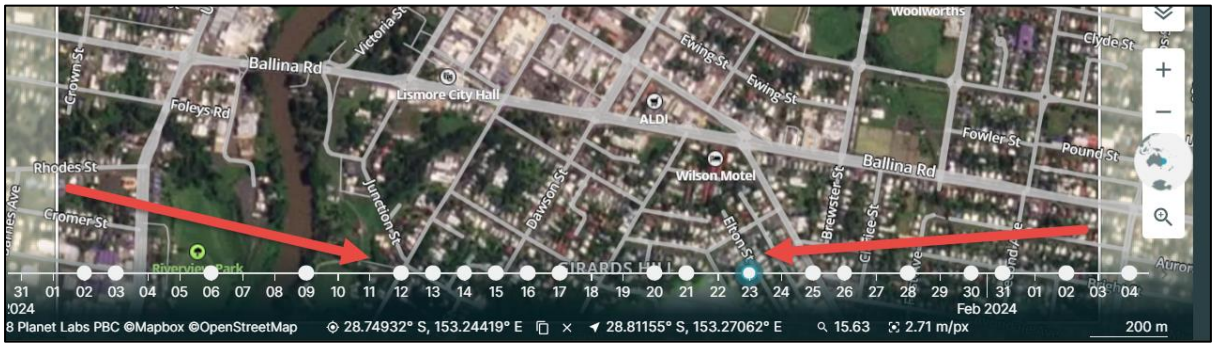
c. Click on the “Eye” icon on the left panel to view an image on the map.



This imagery is cloudy, which means that we need to filter further to find clearer imagery.

d. Select an image along the Time Slider

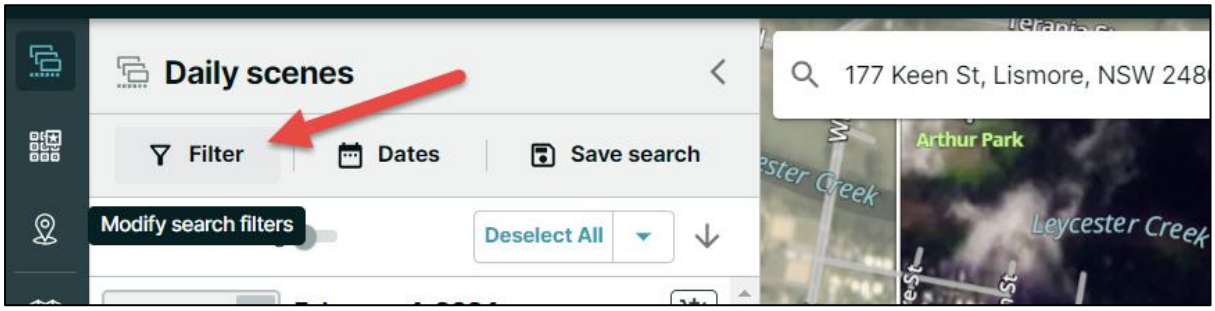
If you search for imagery, a timeline slider bar appears at the bottom of the page. The dots in the slider indicate time intervals. Click on the buttons to switch to images from certain dates.

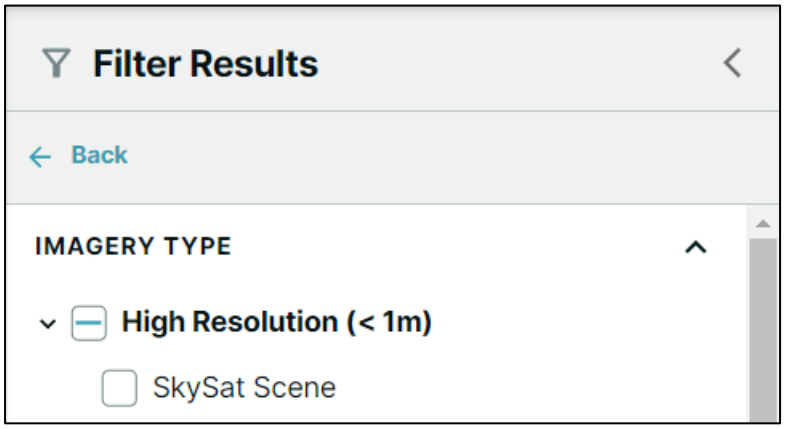


3.3 Filter Options¶

After searching for a location using the search bar or AOI tools, your search results will show under a header that states “Daily scenes”. Under this header, there are tabs that show Filter, Dates, and Save search.

a. Click on “Filter” to access your filter options.





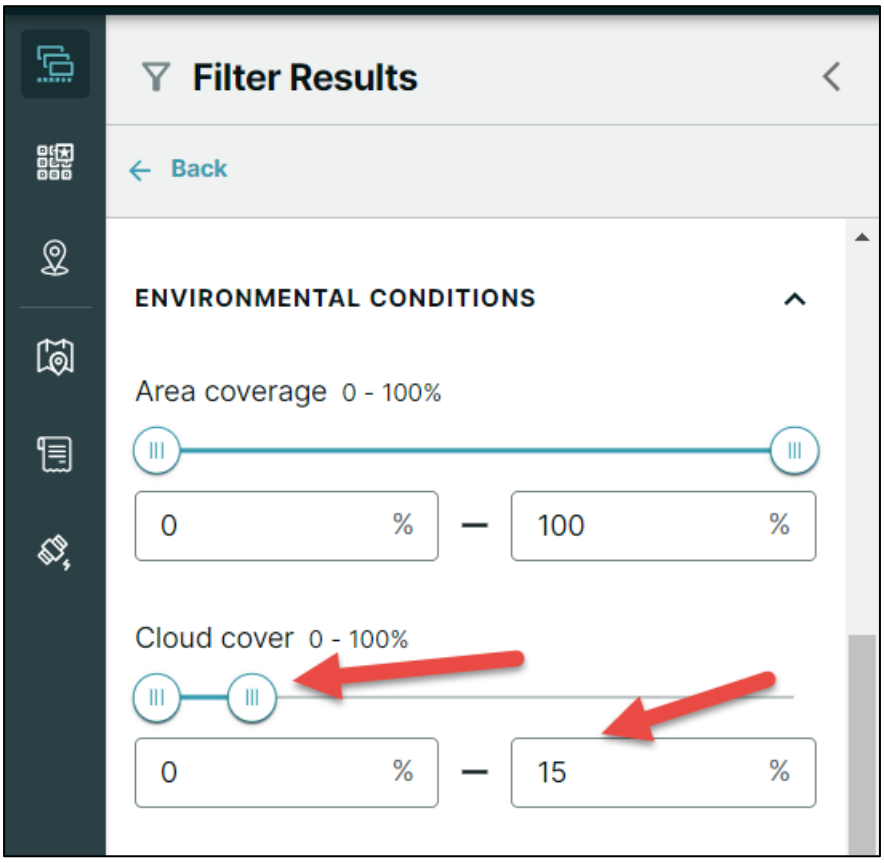
Filter options give the opportunity to filter results based on Imagery type, PlanetScope only filters, Environmental conditions, and Advanced filters, such as showing images that are preview only for your access level.

b. Scroll down to see all available filter options.

You can change your Filter settings to narrow your image results or make updates.

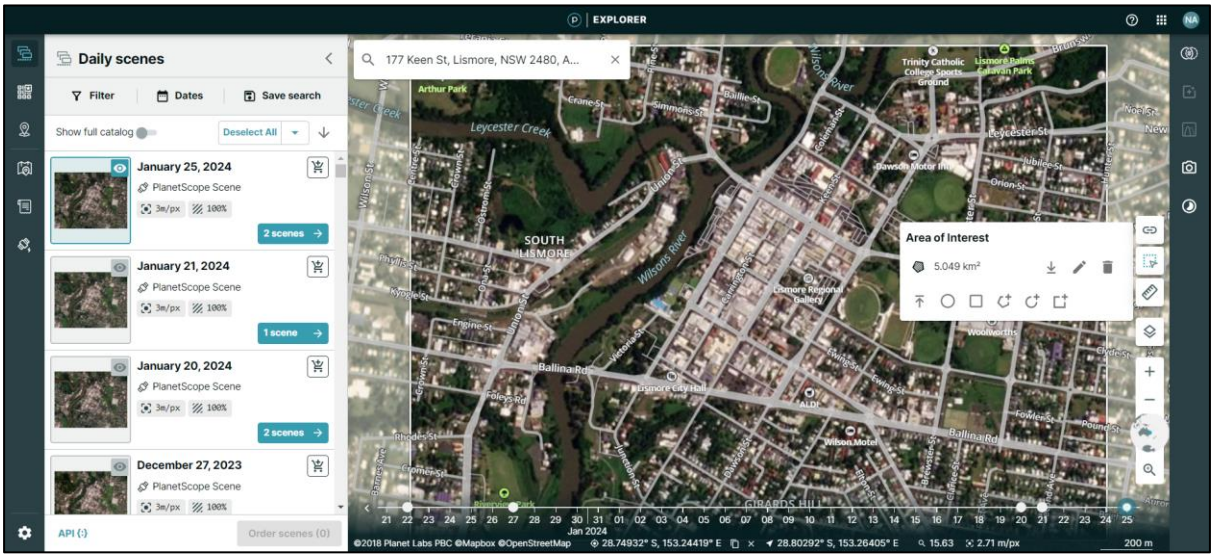
Filters are grouped according to imagery capabilities, PlanetScope filters, environmental conditions, and other attributes. The groups are collapsible for easy navigation. To use filters with environmental conditions, enter the exact values or use the slider.

c. Change the Cloud cover % range to 0 – 15% to see images with less than 15% cloud cover.



d. After you select your filters, click Apply Filters. To start and begin with new filters, select Clear Filters.

You will now see imagery filtered by the cloud cover filter.

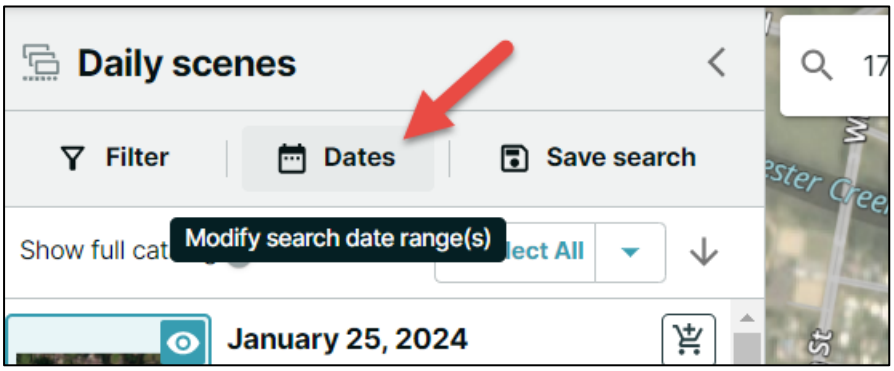


3.4 Date Ranges¶

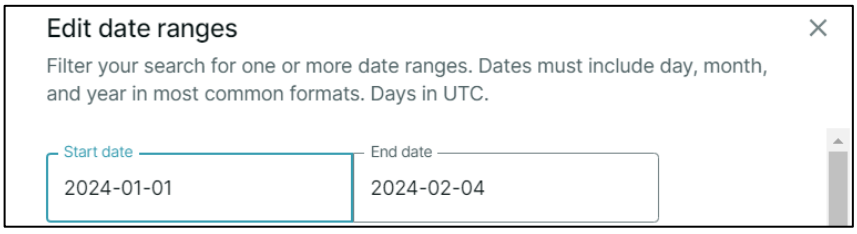
The second tab under Daily scenes is Dates.

IMPORTANT: The days are UTC by default. You will need to manually add ~+11 hours to adjust to AEDT (current NSW time). Please check your local timezone, and adjust accordingly.

a. Click the "Dates" tab to select the dates that you wish to search.

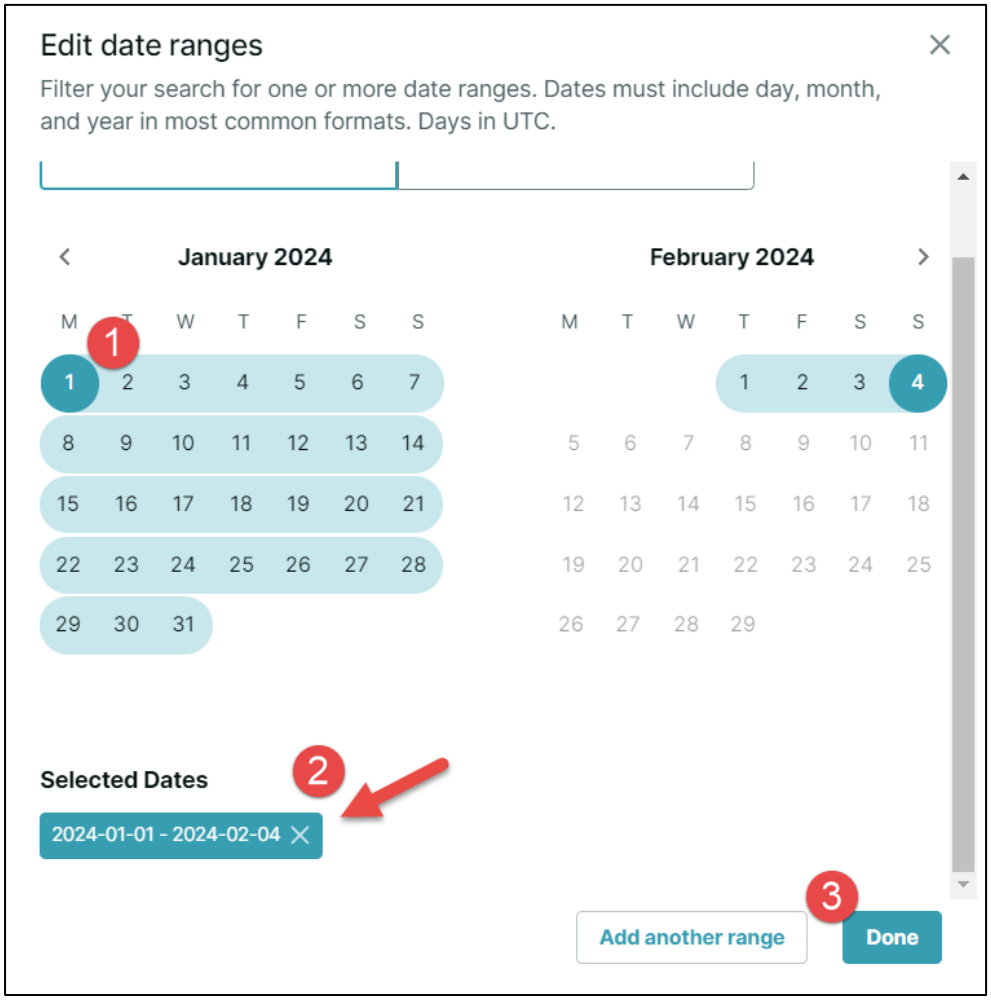


b. Select the beginning and end dates of the range that you are searching.

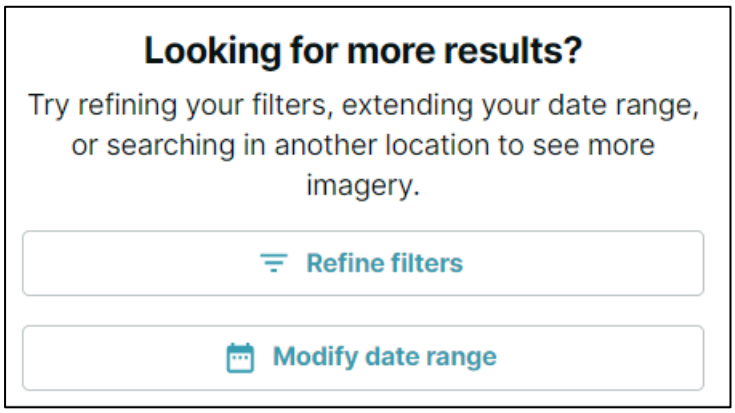


c. You may select more than one date range by clicking the “Add another range button”.

Each of the date ranges that you have selected show under the calendar. You may deselect a date range by clicking the X next to that date range. To easily compare results that are months apart, select multiple date ranges. You can add as many ranges as you need.



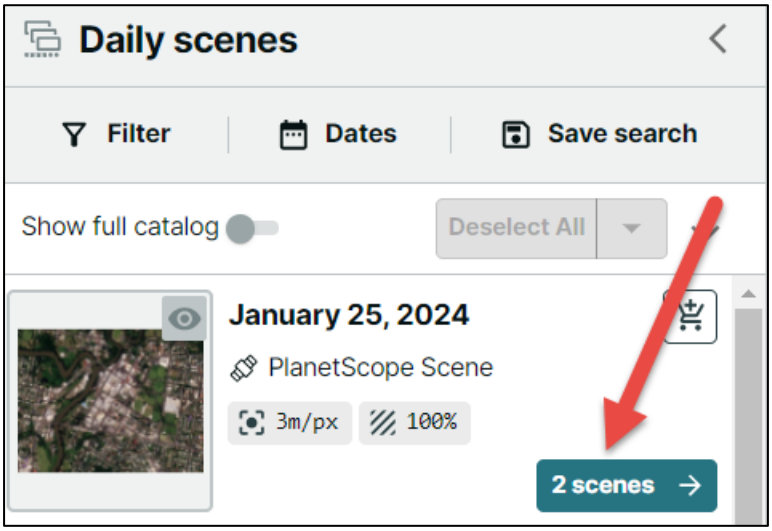
d. Click Done to complete your date filters and see results.
e. If no imagery is available in your date range, double check your filters and modify your date ranges.



3.5 Scene Search Results¶

Each search result appears as a thumbnail image and includes the date of the image, the percentage of area coverage for your area of interest, and the pixel resolution. If the image is partially over-rectified, an icon notification appears. Partially rectified imagery is considered test quality. We can view more information about individual images from the blue button.

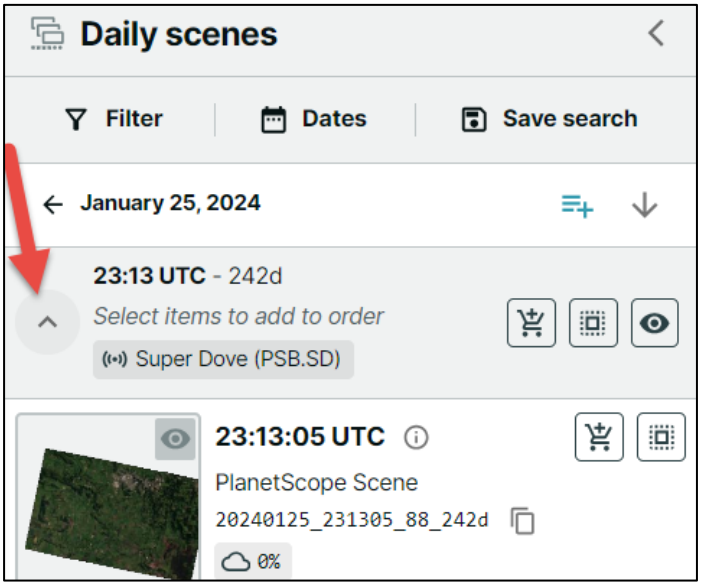
a. Click on the "X scenes →" to navigates to the scene level on a specific date to allow for more granular selections.



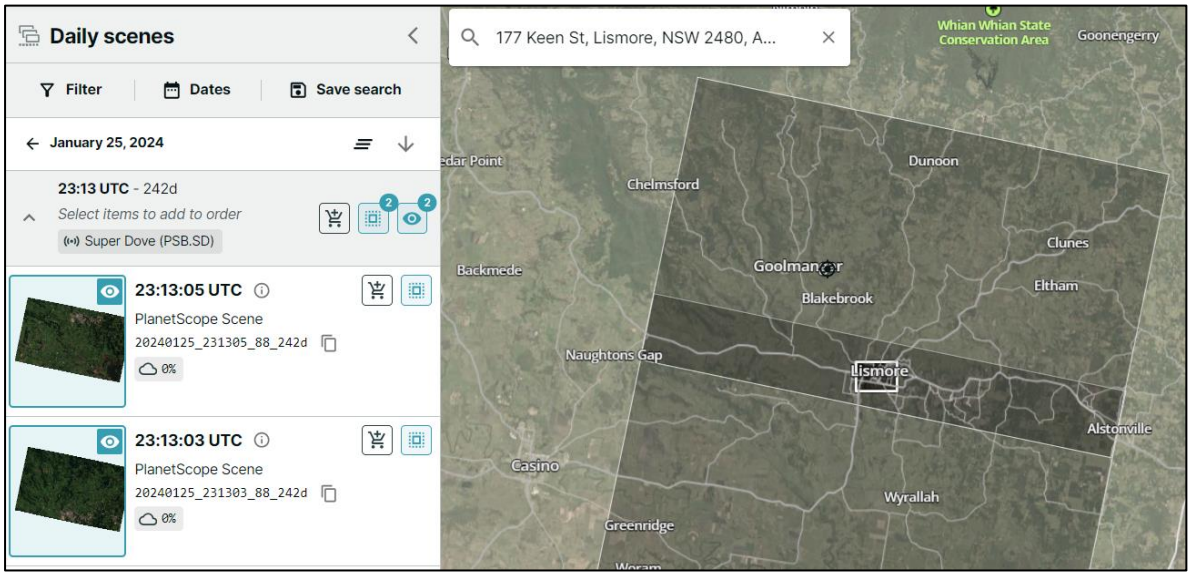
In each of these scene search result drawers, you will see actions that you can take. You will see results organised by date captured. Each of these result cards show three action buttons:

- The eye pulls up a preview of all images from a specific date on the map.
- The shopping cart is not applicable to this subscription.
- The square icon will display "footprints" or outlines of the images on the map.

b. Click on the left-hand arrow to display more information



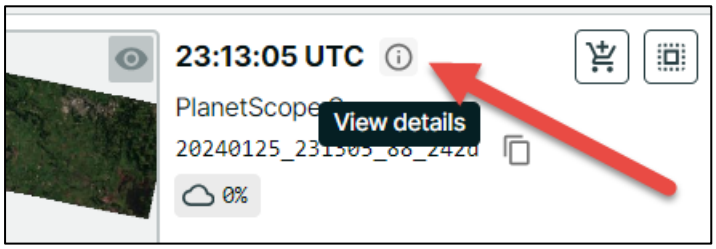
c. Select the square and eye buttons to view the footprints on the map, and images within your AOI or bounding box.



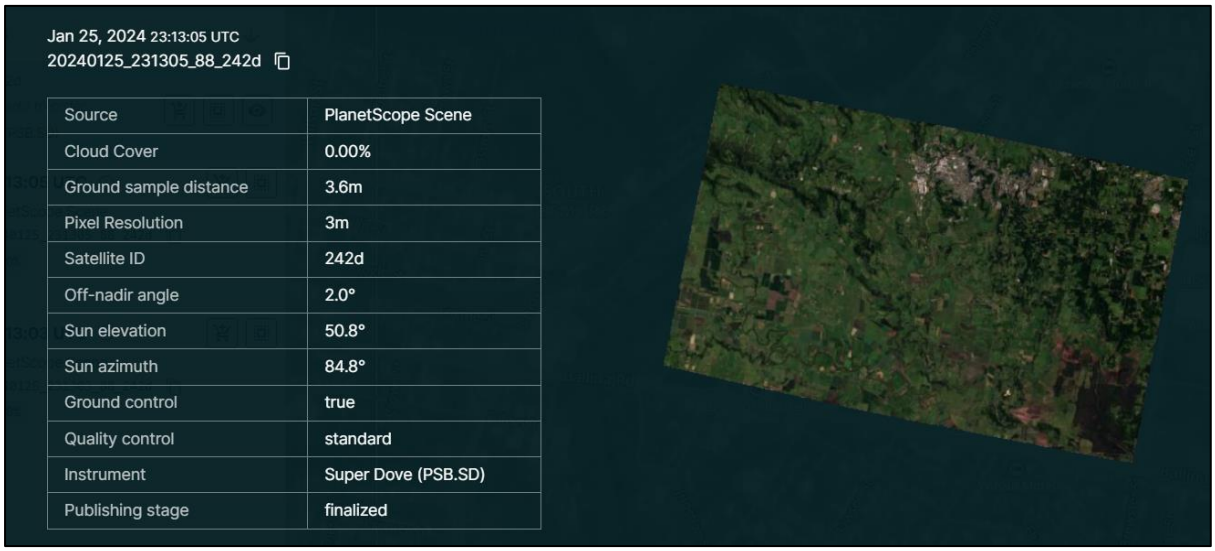
3.6 View details

a. Click the “i” icon as the view details symbol to the right of the date to see metadata about a specific image.

This expands the grouping and displays all images taken on that date and grouped by satellite.



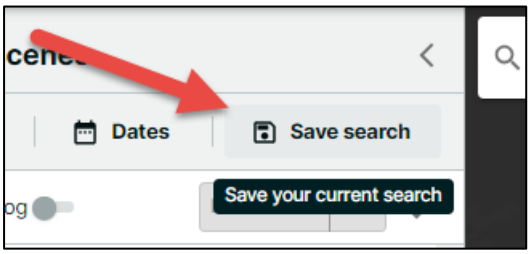
You will see an icon with the instrument filter as shorthand for each satellite constellation. You can inspect imagery more granularly at this step by selecting and deselecting entire groups of imagery or single images.



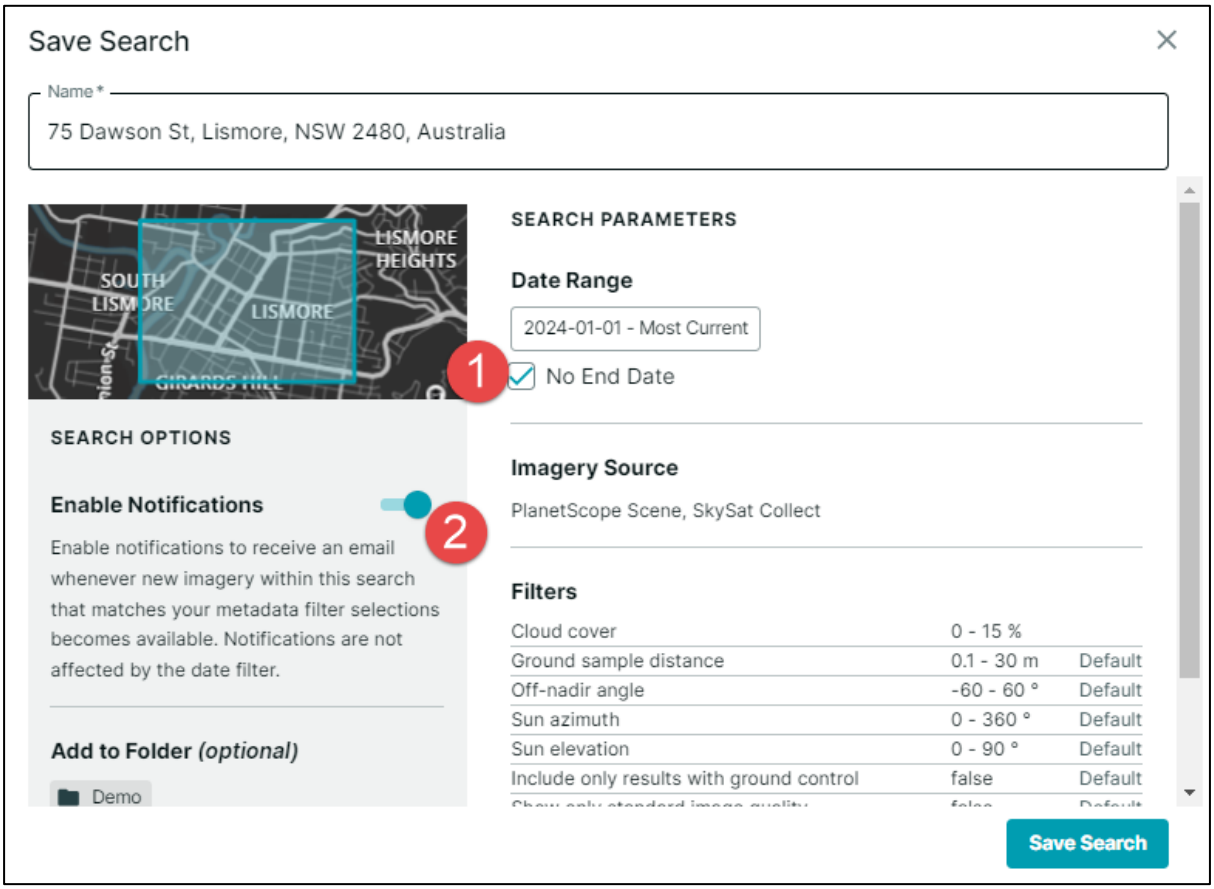
b. Press “X” or esc key to leave the view details mode.

3.7 Save your search

a. Find the Save Search button above the search results on the Daily Scenes panel. This allows you to save your search results and AOI, to search again at another time, without having to redraw or reupload, or refilter with your specifications from earlier.

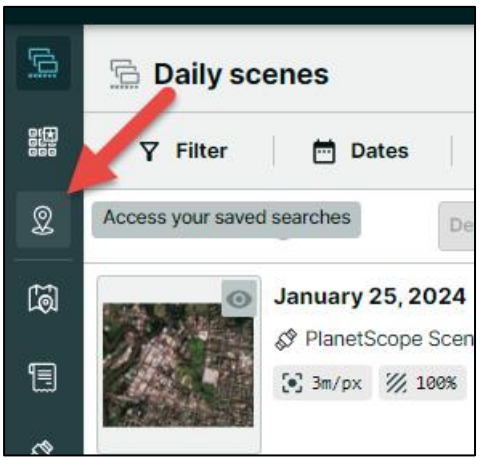


b. When you click Save Search you will see a window appear where you can make some additional selections. Name your search, and then make selections under Search Options and Search Parameters. The name of your Saved Search will default to the text you typed into the Search bar initially.

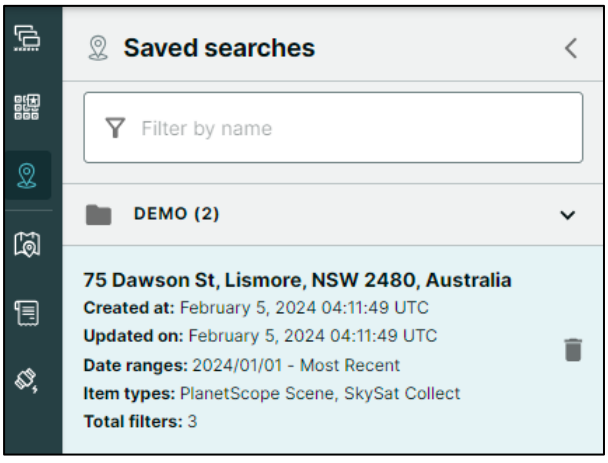


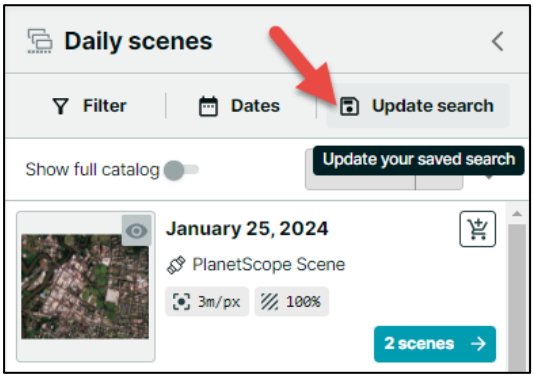
c. Under Search Parameters you can verify your selected date range or omit an end date for your saved search. If you click No End Date you will always see the most recent imagery in your saved search. You can also verify the other parameters of your saved search. If any of these parameters are incorrect to you, click the “x” in the upper right-hand corner and adjust in the Search panel, and click “Save Search” again.

d. On the left-hand side under Search Options, you have the option to enable or disable email notifications and also organize your search into a Folder. When selecting email notifications, email notifications are enabled when the toggle is teal. When the toggle is grey, the email notifications are disabled. You can create a new Folder to organise your searches by clicking typing in a name and clicking Add. Your search will be added to the Folder that is highlighted in teal.
e. Click Save to finalise.
f. To access Searches that you have Saved, click the icon just below the Search icon in the left-hand toolbar, called Saved Search.



g. If you have already Saved your Search, and wish to update it with new filter parameters, you can choose Update Search at the top (where Save Search text was initially).

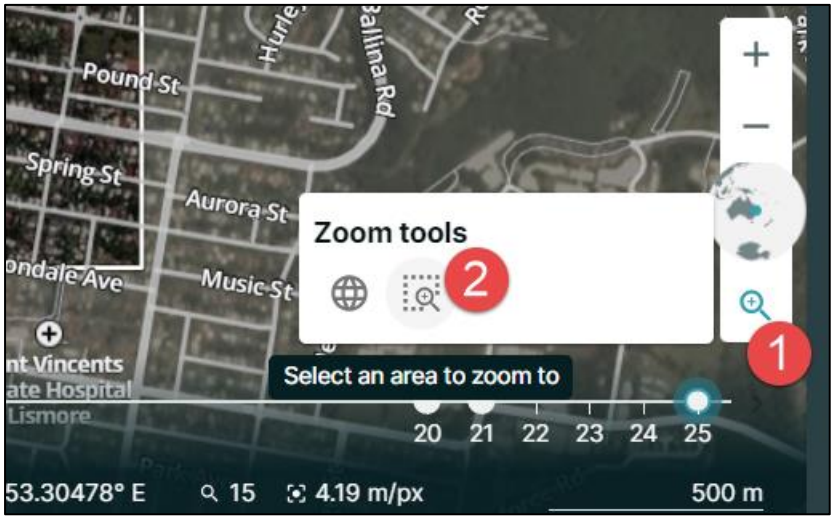




3.8 Zoom Tools¶

The Zoom tools stack at the bottom right hand of the page enable you to navigate throughout your map view.

a. Click on the + and - to zoom in and out.
b. Click on the “Zoom tools” button to find additional zoom options.



If you hover over these arrows, the current zoom level displays. The current zoom level and how it translates into meters and pixels appears at the bottom of the screen.

The globe pictograph gives you context about where you are looking. The teal dot represents your current focus.

Additional zoom tools allow you to quickly zoom into an area of interest or out to the whole world.

Zoom to area of interest is also called the rubber band zoom. This option allows you to draw a rectangle to zoom into an area. The rectangle is not permanent and is an indicator of what extent to zoom into.

3.9 Overlay Layers Toggle¶

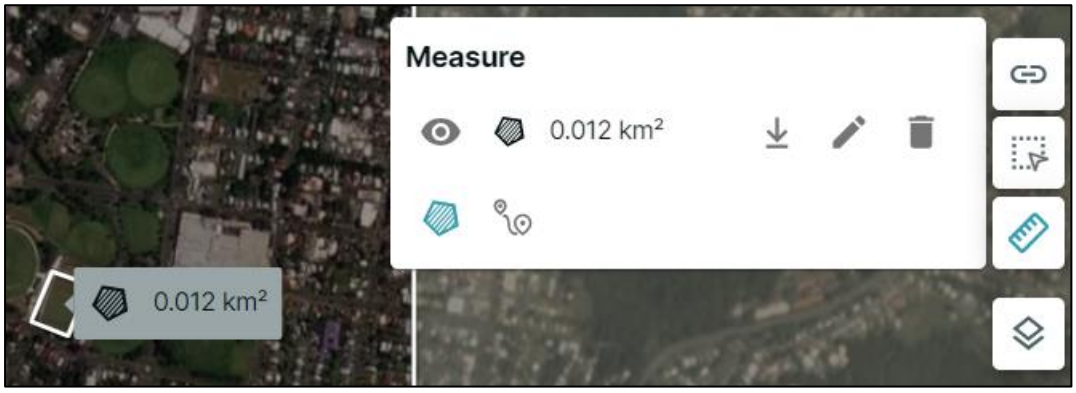
The tool stack of tools located on the bottom right-hand corner of the screen includes an overlay toggle button. Use this button to adjust what you see on the map.

a. If you click the “Labels and Borders” toggle, you can turn the text labels on and off on the map. If the indicator is teal, the toggle is on.

3.10 Take Measurements¶

You can measure the distance between two points, or the area within a polygon. Use these tools to digitise features on the screen, or quickly understand an area.

a. Launch the measuring tools on the bottom right-hand corner of the map using the Ruler icon, below the Draw an AOI button. Clicking this icon will provide an area or line measuring tool.
b. Select the area tool (polygon).



Using the Measure Area tool, you can measure, download, edit, save, or delete drawn geometries and measurements including the area of interest (AOI). When you click on two points, the results are displayed on the map until you clear them. If required, continue to create sets of points, and calculate areas as required.

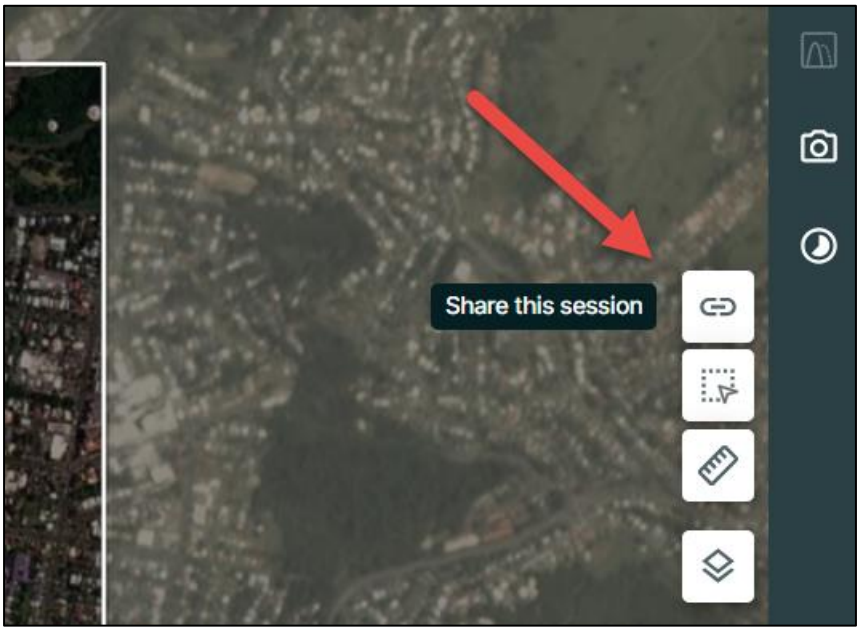
c. Use the second Measure Distance tool. When prompted, click to create segments. To create a segment:
   - Hold shift to draw free-hand.
   - Click twice in the same location to end.
   - After you create one or more segments, double click to end the line measurements.
   - The line turns white, and a final distance is displayed. You can create multiple measurements on the map.

d. Click on the trash can to remove measurements and click on the ruler icon to close the measurement menu.

4. Session sharing

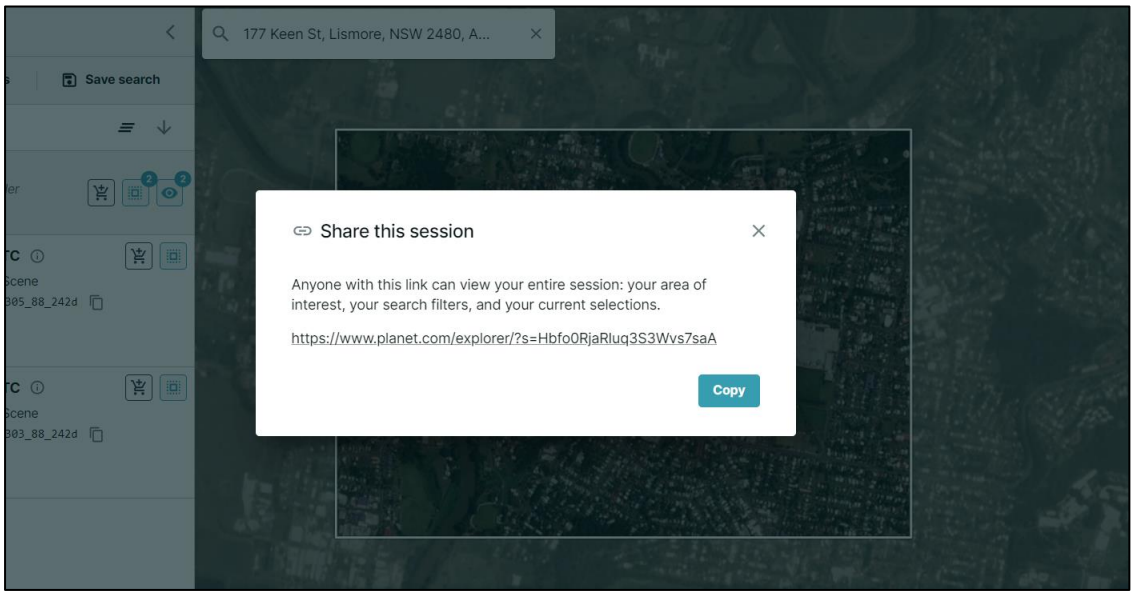
4.1 Click on the Session sharing button

a. The “link” session sharing button is located in the top of the left toolbar stack.



4.2 Copy to share your session with a link¶

a. When you select the link icon, you will see a short URL to copy. Anyone who also has an NSW Imagery Hub Planet account can view your entire session from this link, including: your area of interest, your search filters, and your current selections.



b. Try clicking on this link to see my shared session: https://www.planet.com/explorer/?s=Hbfo0RjaRIuq3S3Wvs7saA

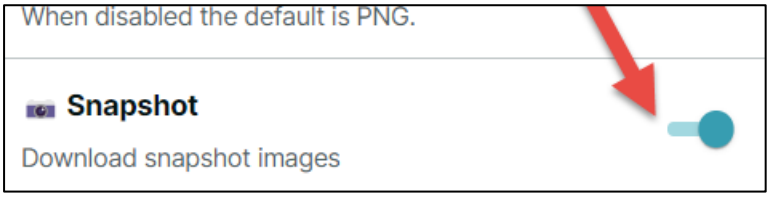
5. Snapshot tool

5.1. Enable the tool

a. In the bottom left-hand corner, click on the Settings icon, which will open up a modal panel on the left hand side with Preferences and Labs.

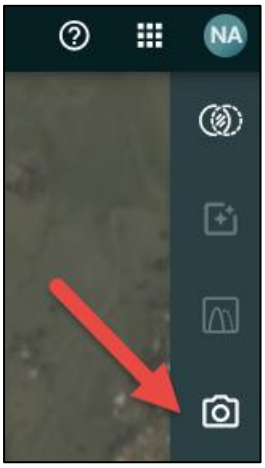
b. When you click Labs, you will see a list of different experimental features that are provisionally available in Planet Explorer. Feedback in these tools is welcome.

c. To turn one of these beta features (Labs) on, click on the toggle button. Turn on snapshots.



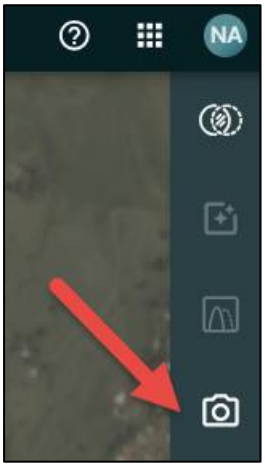
When the toggle button is switched to on, the button is teal, and when switched to off the button turns white. You can toggle these Labs on and off anytime you like.

d. Once snapshots is turned on, you will see a camera icon on the right-hand side of the Explorer screen.



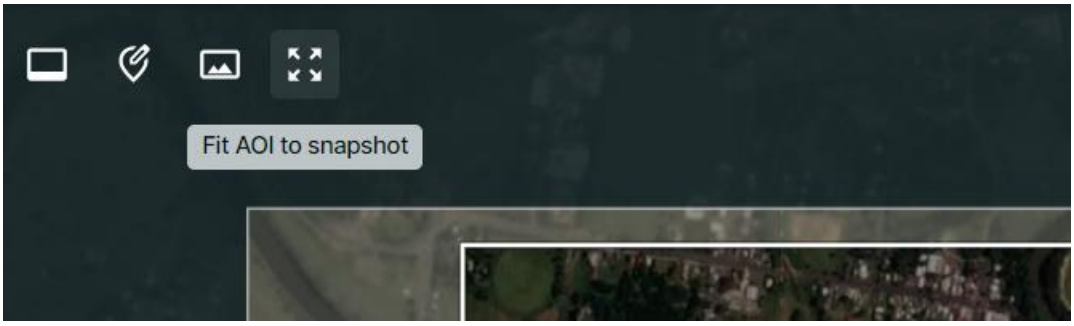
5.2. Take a snapshot

a. Click on the snapshot tool on the right-hand side of the screen.

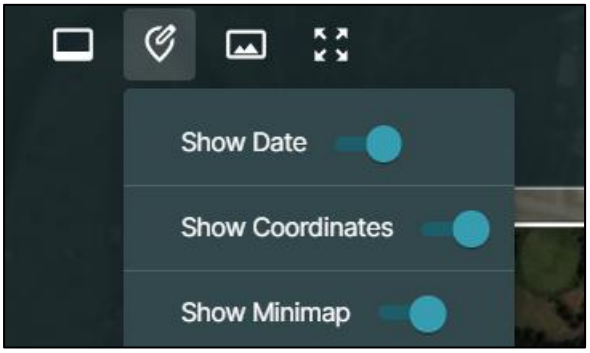


b. Collapse the side bar using the arrow if your left panel is open

c. Center the location of interest for the shot. You can click on the "Fit AOI to snapshot" setting, as the last button in the top left corner of the screen, to assist with this.

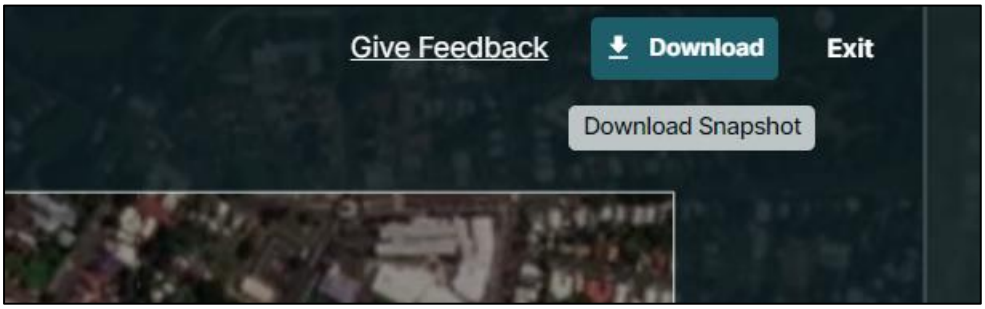


d. Select the Overlay options to add/remove options from the bottom of the snapshot.

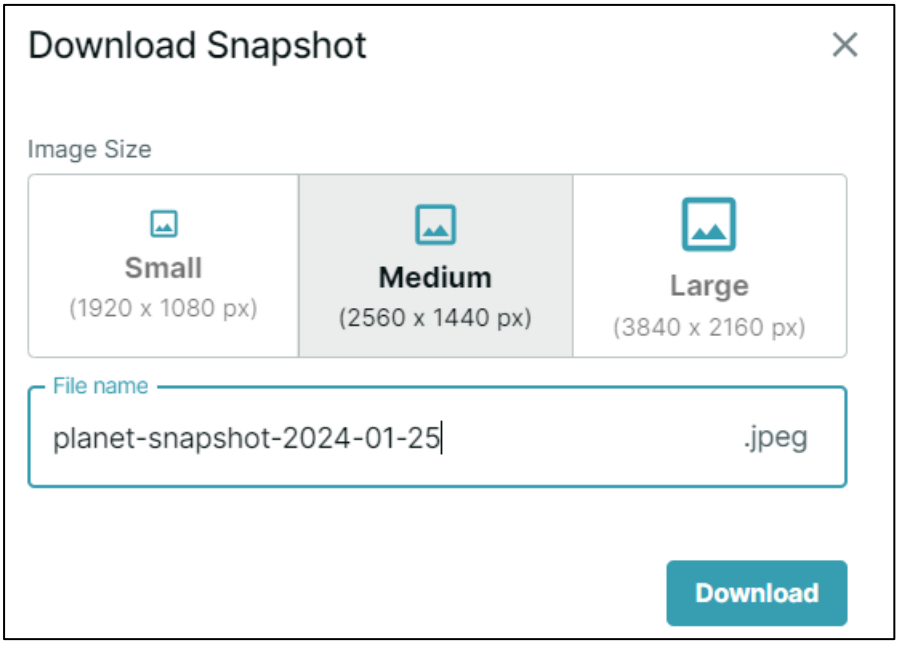


e. Click on the first icon to change the footer style, which will change the border display.

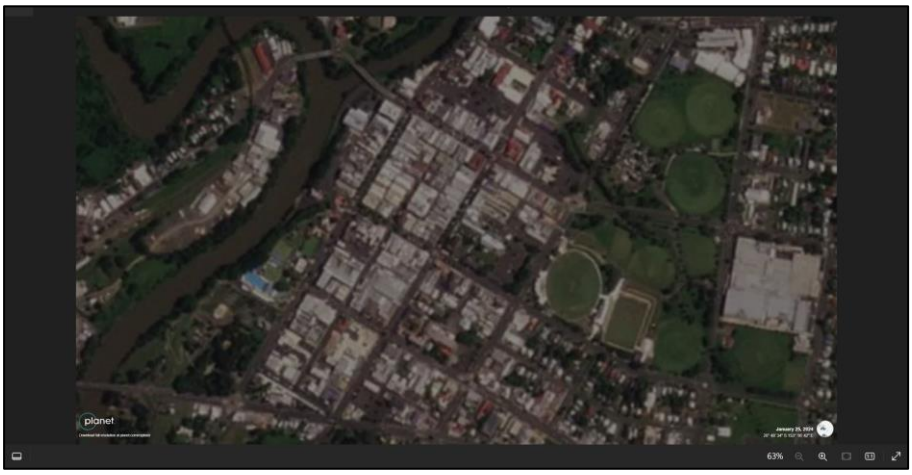
f. Once ready, click on the Download button.



g. Select the downloaded JEPG image size, and type in a file name.



h. Click download, and your image will be available in your computer's downloads folder.



i. Click exit in Explorer once you have downloaded the file, to continue using Explorer.

Note that is a flat 'snapshot' as a jpeg. If you would like to view the GeoTIFF file with 8 bands for analysis and additional information, please contact: Spatial.imagery@environment.nsw.gov.au.

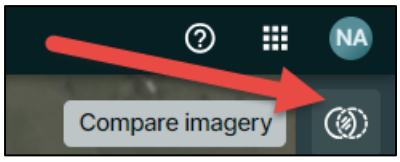
6. Compare and differ tool

You can perform basic analysis on imagery in the Explorer browser by comparing imagery side by side and enhancing pixels to see differences.

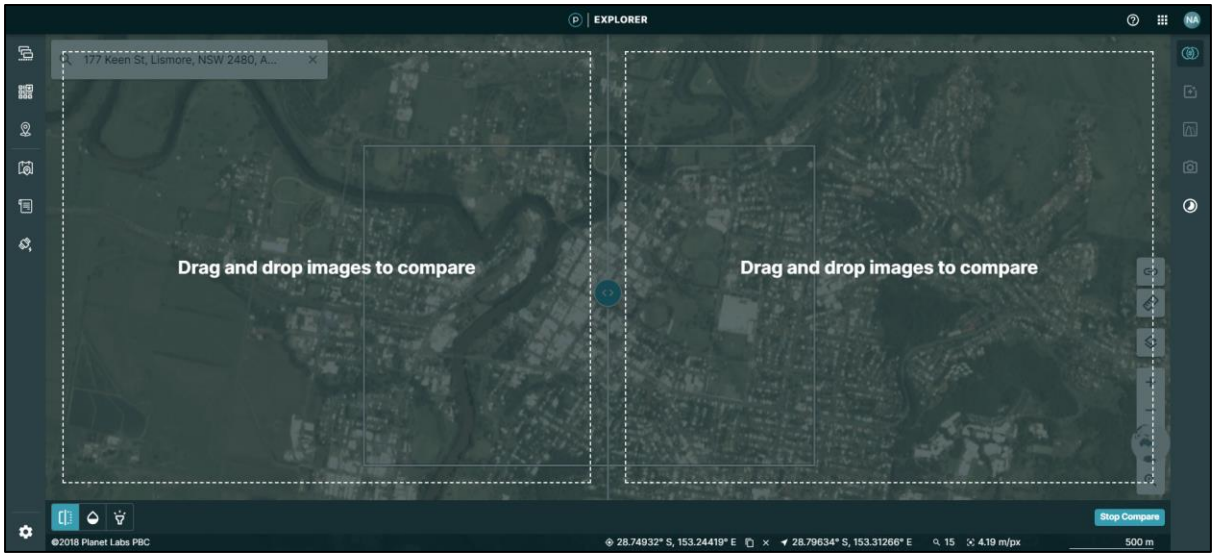
6.1 Compare imagery¶

You can compare sets of Planet imagery from different days, months, and quarters side by side.

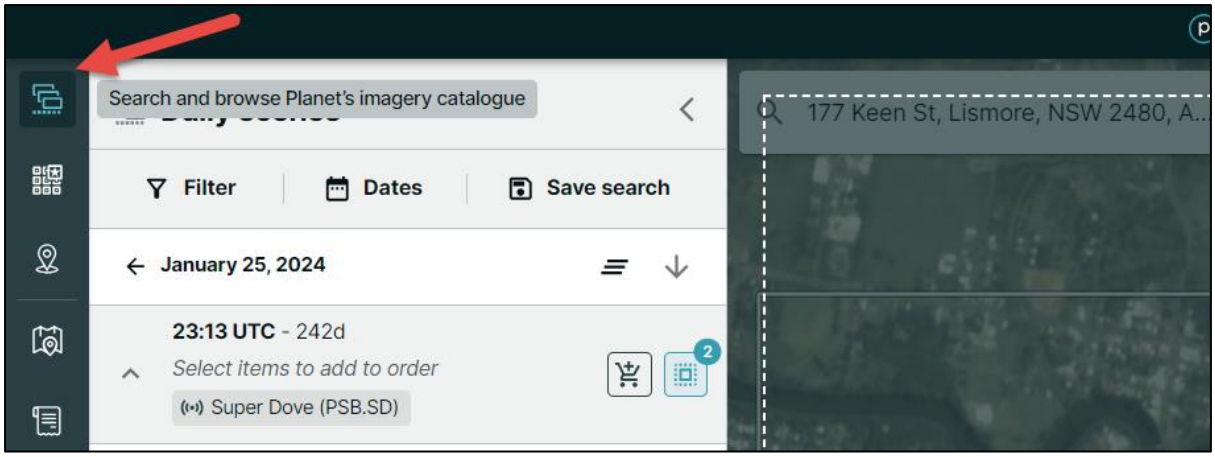
a. In the docked toolbar on the right hand side, you will see the Compare icon at the top of the stack.



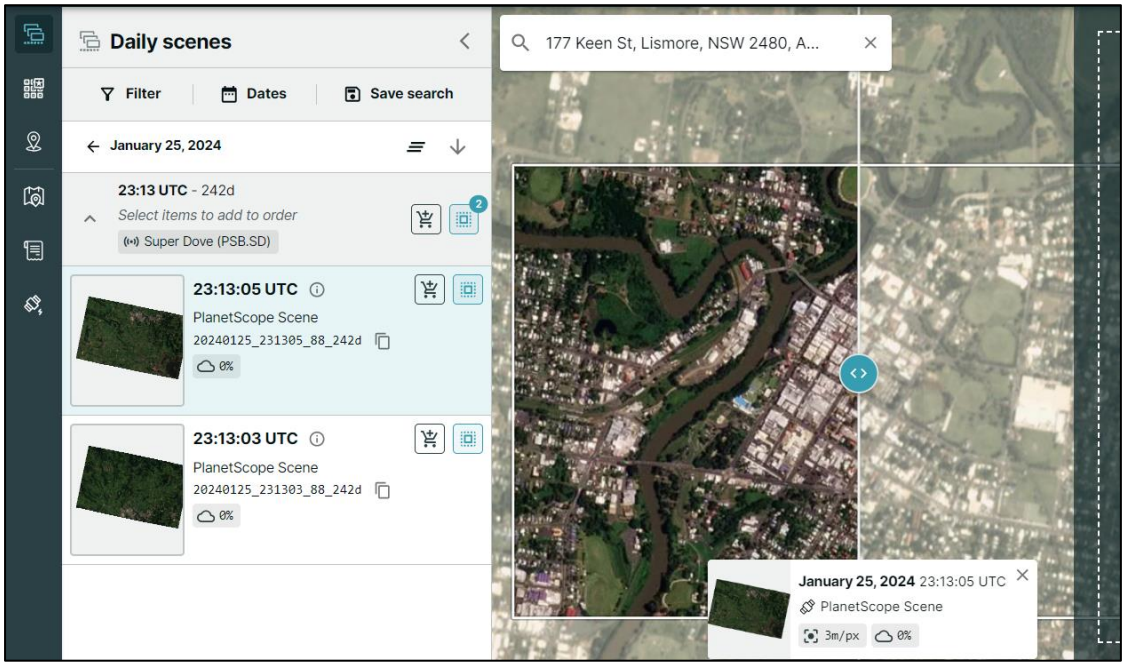
b. When you click the Compare icon, the map view changes, and you see a prompt to Drag & Drop Images to Compare.



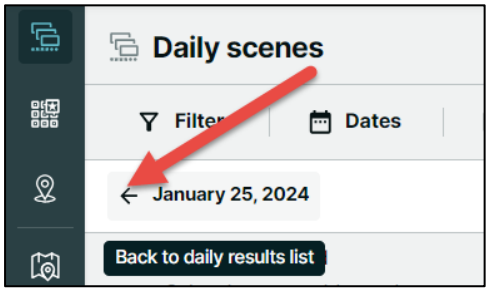
c. Click and drag any image from the left pane, and release when on top of the map view. Launch the Daily Scene panel by clicking on the top left icon. Drag and drop an image.



d. You can see the information box in the bottom center describes the image that has been added to the map view.



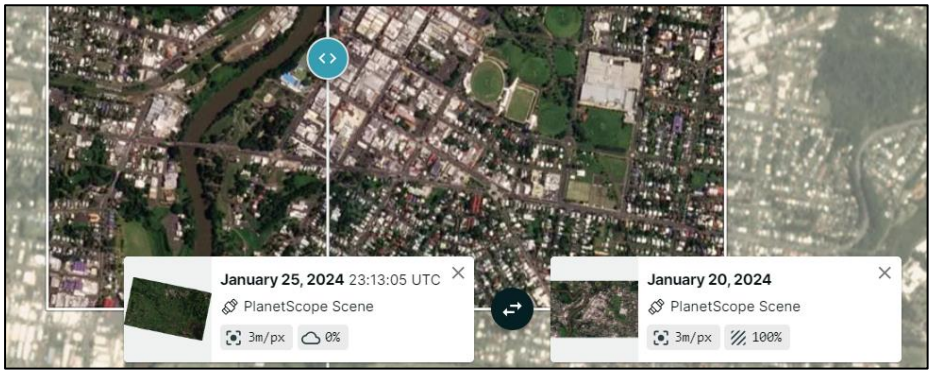
e. Repeat again with a second image from the list in the left pane. Select the “Back to daily results list” to go back to the Daily scenes.



6.2 Use the Slide tool¶

This is the default option selected as you choose the Compare tool. This controls the slider bar allowing you to view two images stacked atop each other.

a. Drag the slider to compare images.



Now you can see two images have been added to the map view, and a slider bar is visible in the middle of the map view. The image on the left side of the slider icon corresponds with the tile description at the top left, and similarly for the image on the right side and the corresponding tile description on the top right. By clicking on the slider icon and moving the mouse left or right, the map interface changes, and you can compare the two images that have been stacked one atop the other.

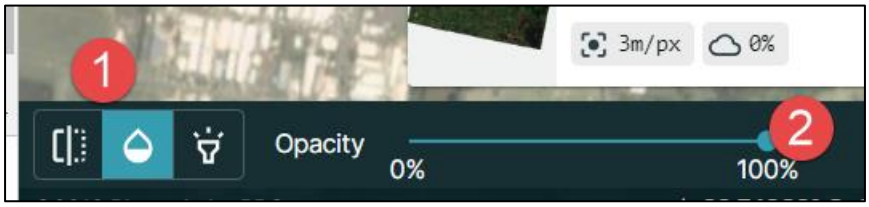
b. The icon in the top middle indicates that you can swap the imagery overlay (so that the bottom image becomes the top image).

c. To swap the image on the map view with a new image, simply click and drag a new image to the map view, and drop in the proper quadrant to replace the image you don't want to compare anymore.

When comparing imagery, there are two tool icons in the bottom left stack - Slide and Opacity. Don't click "Stop compare" yet, if you are going to continue to use these tools below.

6.3 Use the Opacity tool¶

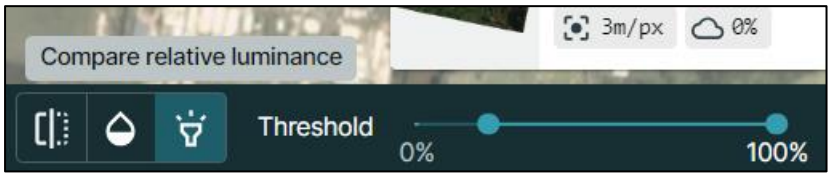
a. If you choose the Opacity option, you will see the top left image along with an Opacity slider bar at the bottom of the map view. This will change the transparency of the image over top of the other image.



b. As you slide the Opacity bar to the right, the top image will fade, and the features of the bottom image will start to become visible. Try dragging the slider to see the differences.

6.4 Use the Relative Luminance tool¶

a. If you choose the relative luminance option, you will see the top left image along with a threshold range slider bar at the bottom of the map view.



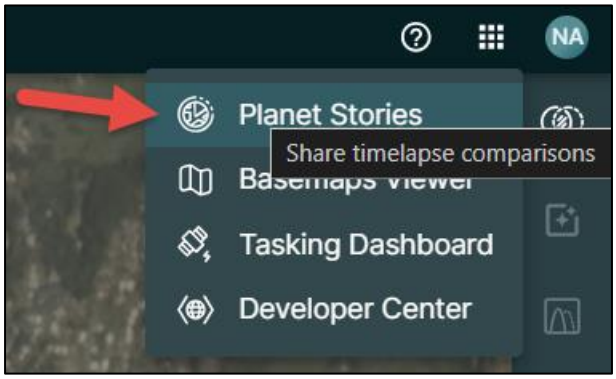
b. This will highlight the pixel luminance difference between the two images. The formula used can be found here. This can help you identify changes between the images.

c. Select stop compare on the bottom right corner to exit the compare window.

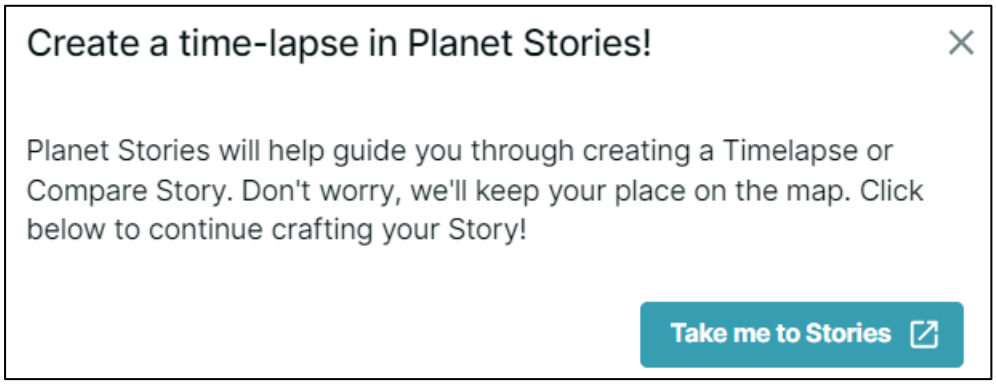
7. Stories

7.1 Launch Stories

a. Navigate to the top right corner of the page to select the application launcher, and select "Planet Stories". You can also navigate to: https://www.planet.com/stories/create



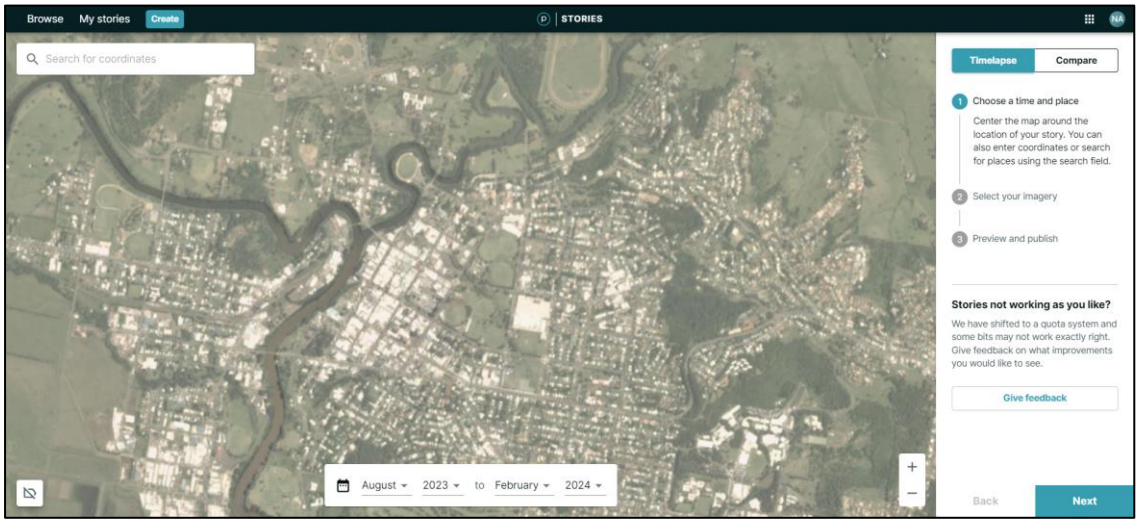
b. Alternatively, you can click the "Stories" icon in the right-hand toolbar, at the bottom of the stack. When you click the icon, a pop-up opens with a link to the Planet Stories application.



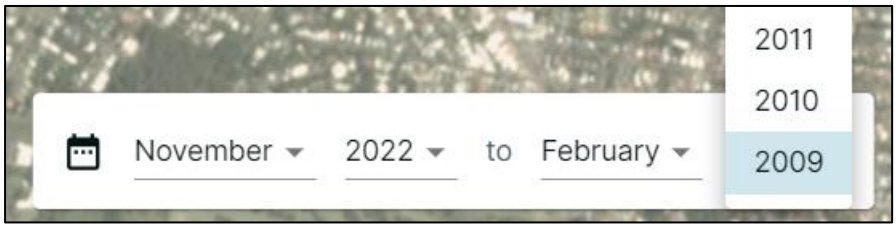
7.2 Create a Timelapse¶

If you would like to compare multiple images over time, you can create a timelapse in the Stories web application. In Stories, you can make timelapses of multiple images, or a 'swipe' application to share the comparison of two images. You can also publish your timelapses on the Planet website or on your own location (for example, website or social media account, or PowerPoint presentation).

a. Start by selecting a location on the map view. If you opened the page from Explorer, your AOI will be centered on screen.



b. Select a date range on the bottom center of the screen between two months and years.



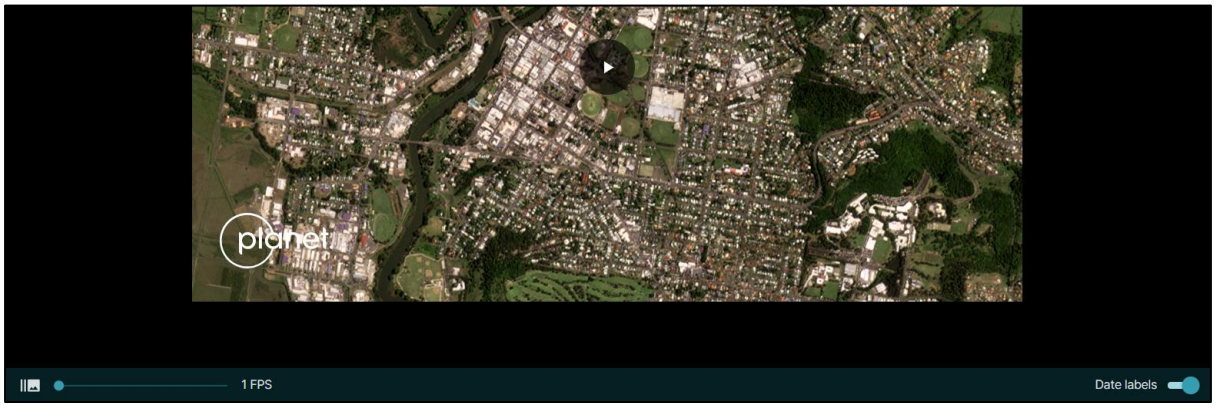
c. Decide if you wish to create a timelapse or compare (two images swipe app), the default 'timelapse' will be selected in the top right corner of the page.

d. Click next on the bottom right when ready.

e. Select the images you wish to utilise in the timelapse. You can filter to remove cloud-covered images using the "Sort" and "Filters" button. You can click "Auto-select" in the top right corner, if you want Planet to automatically select images. These can be changed after auto selection. Each image selected will be a single frame in the timelapse.

f. Your selection will display on the bottom band. Click next.

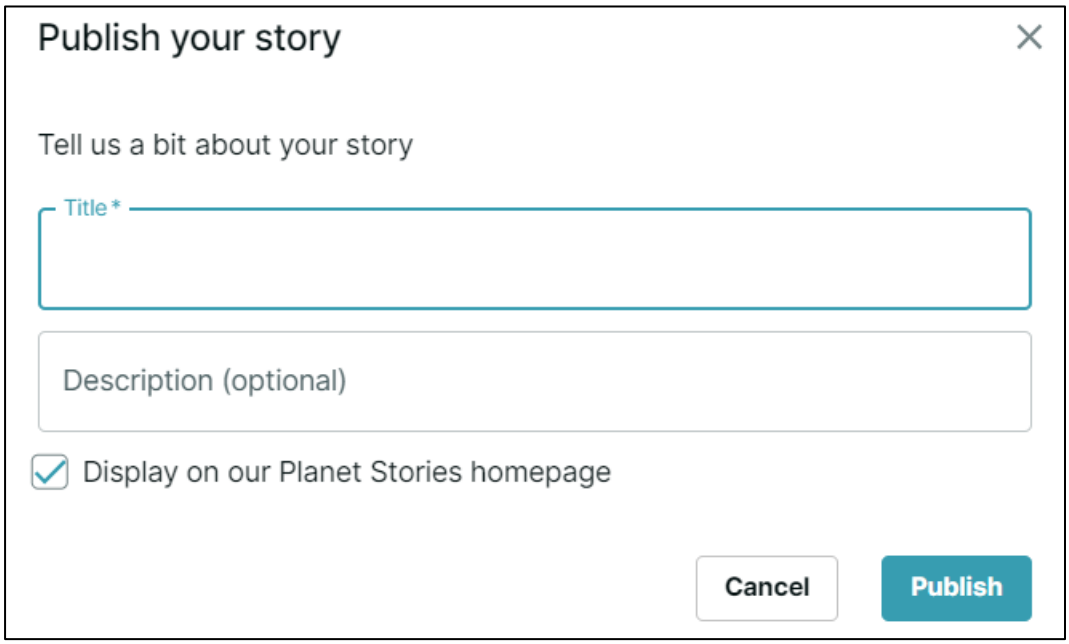
g. Hit the play button in the screen to preview the timelapse.



h. Review the speed settings as frames per second (FPS) in the bottom left corner. You can also remove the date labels if required using the button in the bottom right corner.

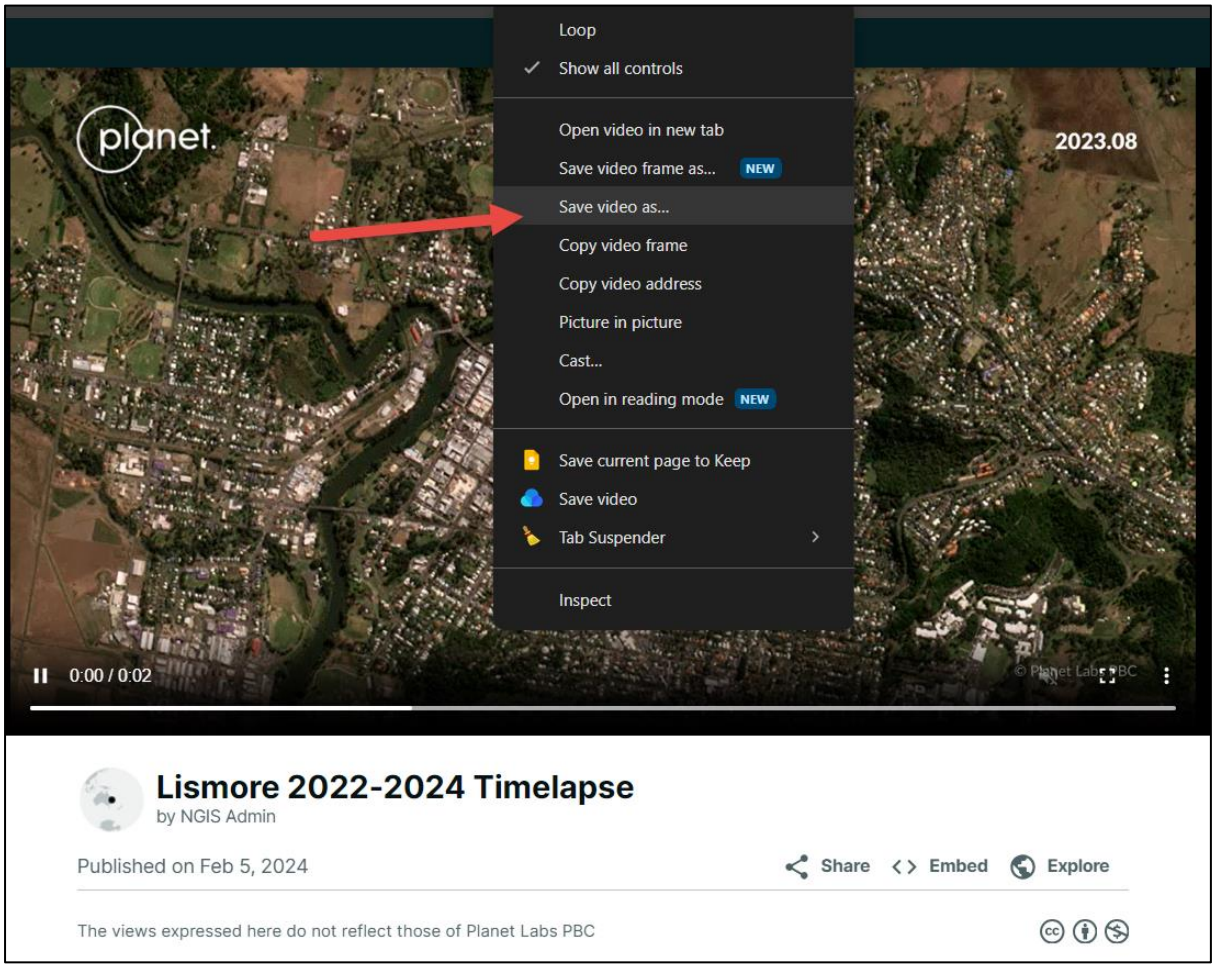
i. Finalise and launch the final product by selecting “Finish”.

j. Add a title and description if required. Tick off the “Display on our Planet Stories homepage” if you do not wish for the timelapse to be made available on Planet’s Stories homepage with other timelapses created from others around the world. This is because all Planet Stories are created with a CC-BY-NC license and are sharable online. Please note that the option is ticked by default and must be unticked each time a timelapse is created.

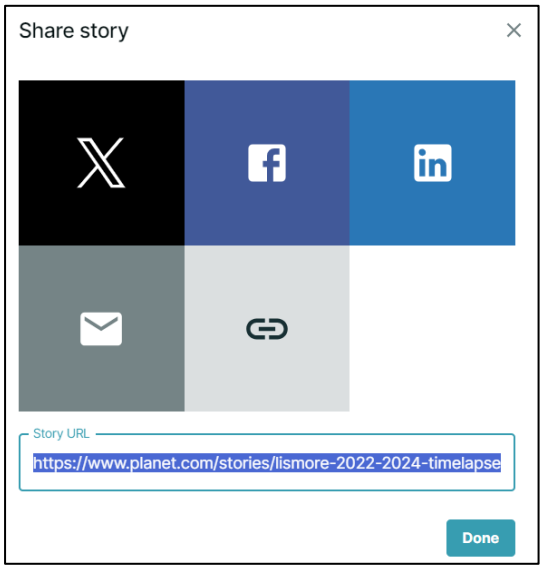


k. Click publish. This will launch a webpage with your timelapse. It may take a while to load on screen, as it will be publishing to Planet’s servers.

l. You will see many options on the screen to share the timelapse. Right click the video and select “Save video as…” to export as an MP4 file on your computer.



m. You can also select the “Share” button to be provided with a link to the webpage. Copy and paste from the panel, and then select “done”.



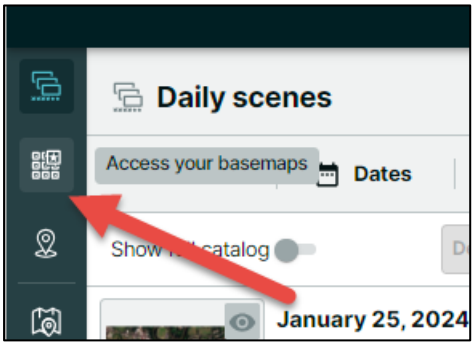
n. Try accessing the story I created here: https://www.planet.com/stories/lismore-2022-2024-timelapse-_ztYgqpSR

o. Lastly click the “Explore” button to be taken back to the Explorer interface, launching a zoom of the map location used in the timelapse.

8. Basemaps

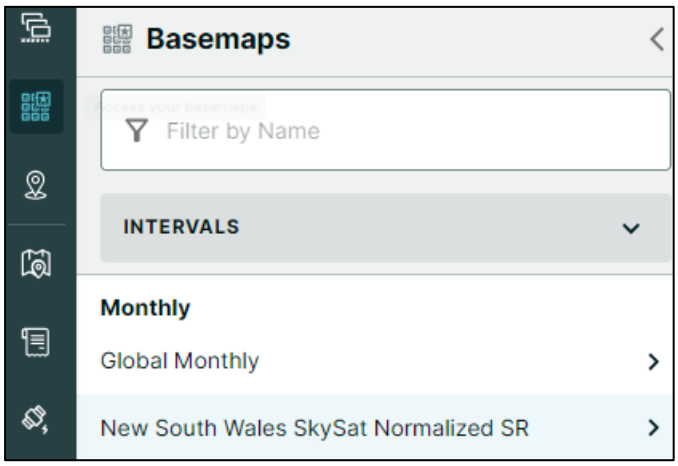
8.1 Viewing Basemap Mosaics

a. To access your Basemaps in Explorer, click the “Access your Basemaps” icon from the toolbar on the left side of your screen.

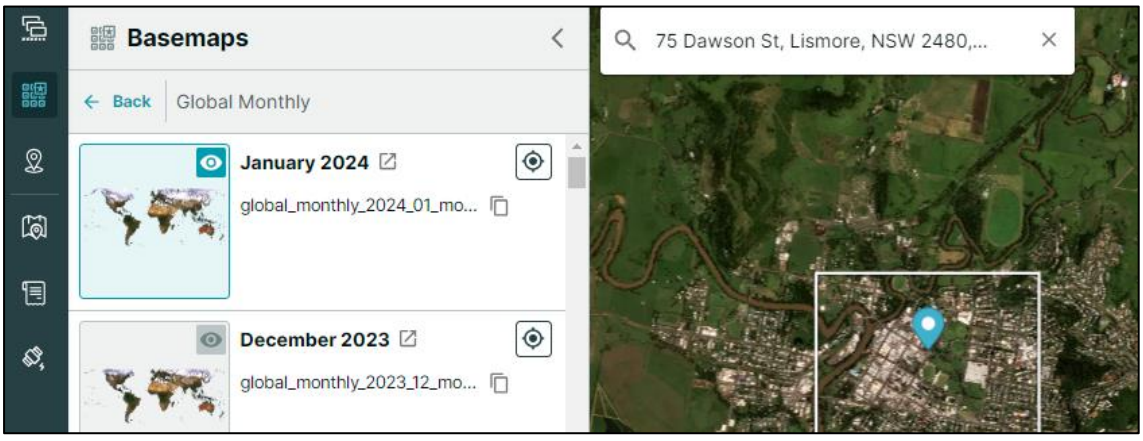


b. The Intervals option allows you to select from the following Basemaps:

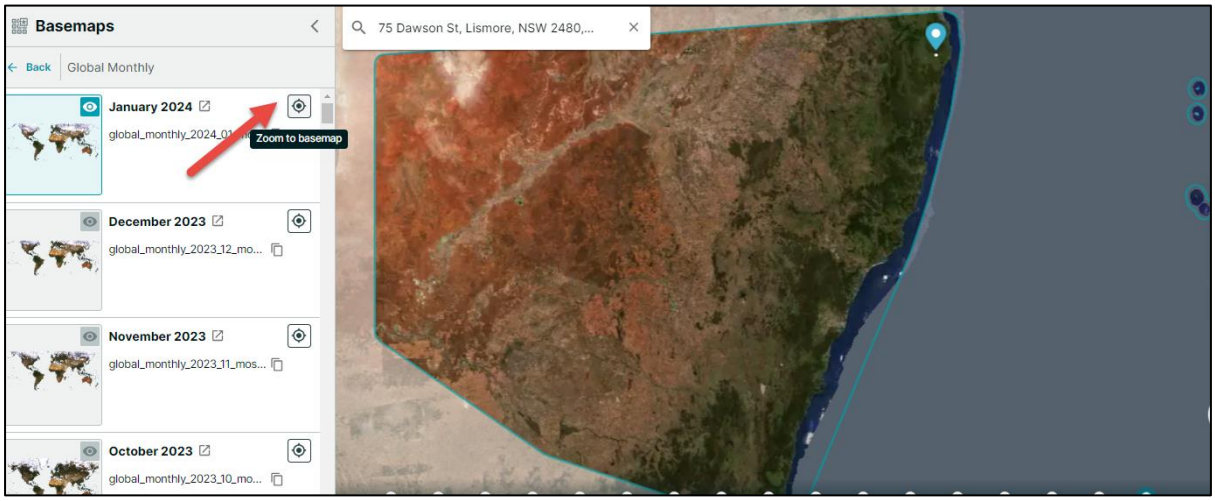
- Global Monthly - Basemap changes the time slider show each month of the year.
- New South Wales SkySat Normalized SR – This basemap only displays Greater Sydney captured between 1 Dec 2023 – 13 Jan 2024.



c. You can deselect a Basemap either by entering Command+Click for Mac or Control+Click for PC or by clicking on the Basemap name. Click on Global Monthly to see a list of the months available. Select the Eye icon to display on screen.

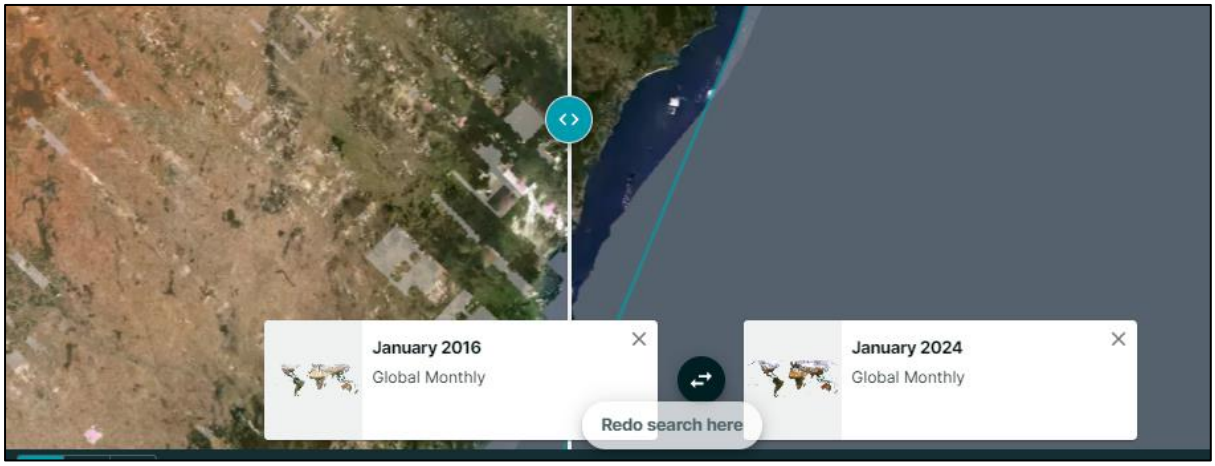


d. Click the compass button on the right to zoom to the full extent of the basemap.

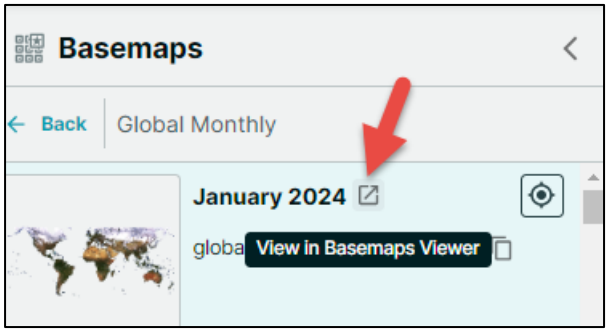


Scroll down the list to find the earliest basemap available (January 2016).

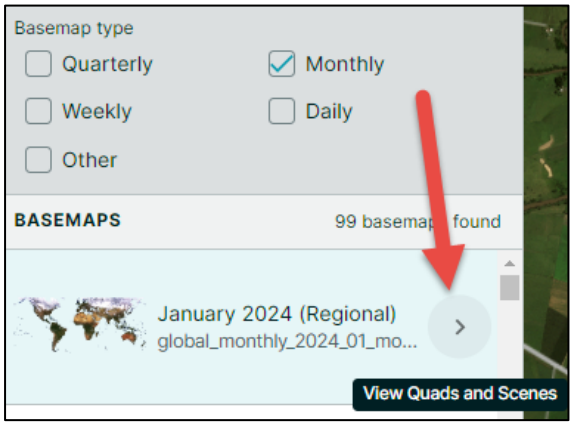
e. You can use the comparison tools from earlier to see differences between the Basemaps.



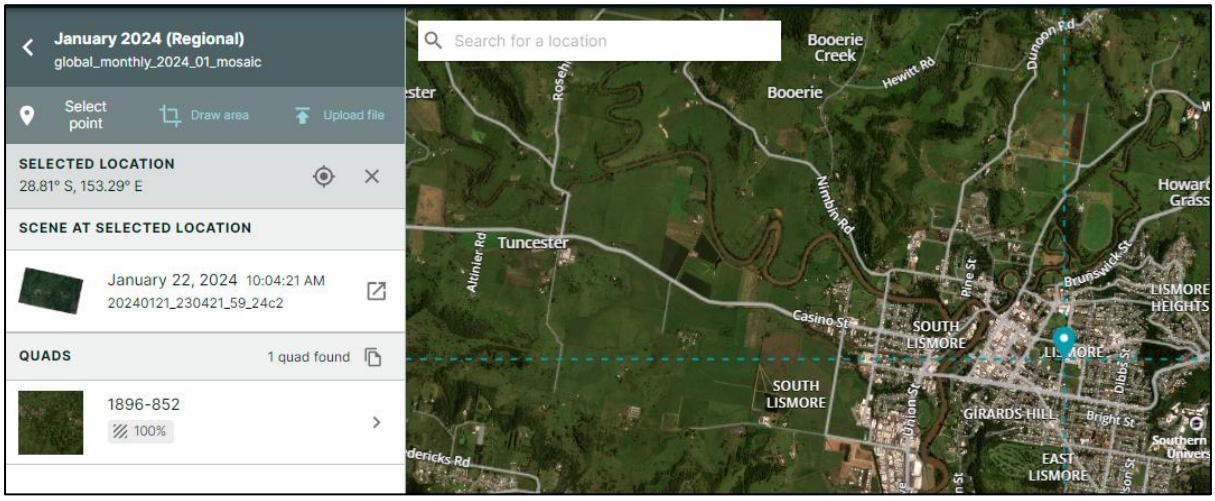
f. Launch Planet's Basemap Viewer by clicking on the arrow next to the Basemap's name, or using the application switcher in the top right-hand corner. This tool can also be used to compare basemaps, and can identify which individual image scenes contributed to the basemap mosaics for more granular inspection. You can also access the Basemap Viewer by navigating to: https://www.planet.com/basemaps/



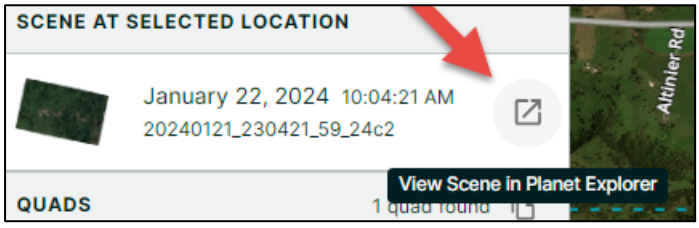
g. Click on the arrow in the Basemap Viewer to launch the inspector tool.



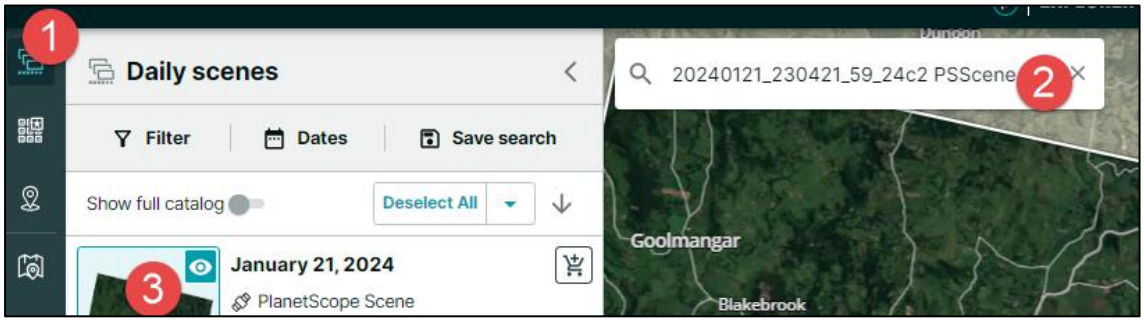
h. Click anywhere on the screen to identify which images are within the mosaic. For a monthly basemap, this can help you to identify exactly when the image was taken for any given pixel displayed in the basemap of multiple images combined together.



i. Click view scene in Planet Explorer to be taken back to the Explorer interface, to view the single scene selected that was used in the basemap.

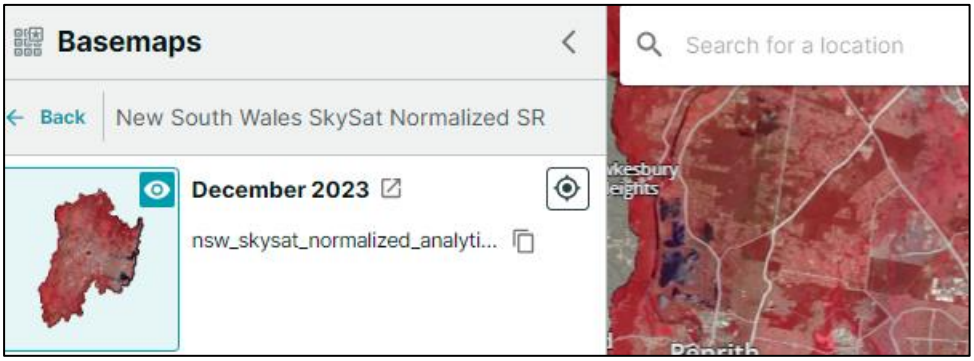


j. Open the Daily scene panel, or click in the search bar, and click the eye icon to view more.

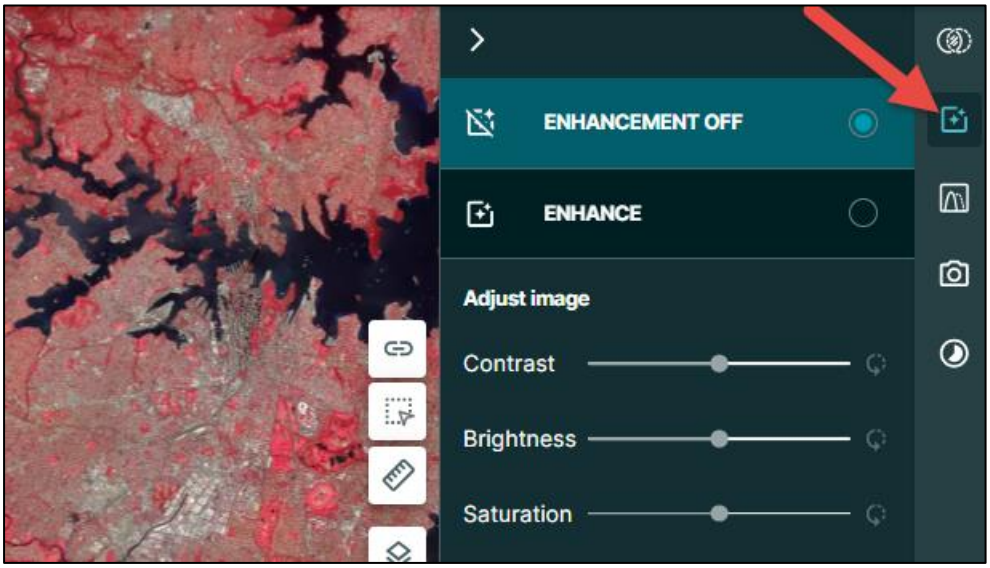


8.2 Using the New South Wales SkySat Normalized SR Basemap

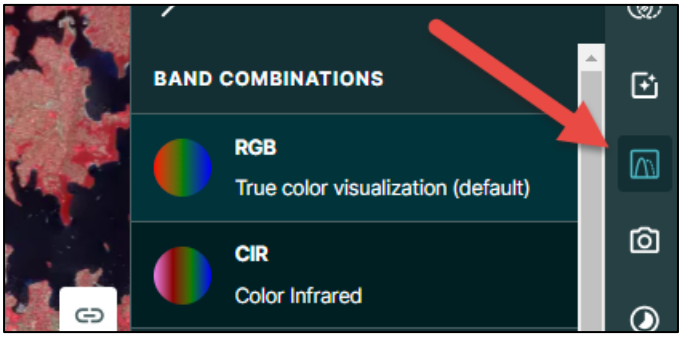
a. Go back to the Basemap Access in Explorer to load the New South Wales SkySat Normalized SR. This basemap only displays Greater Sydney captured between 1 Dec 2023 – 13 Jan 2024 using SkySat 0.5m with 4 bands (Near-infrared). The standard colouring of the basemap is a redish hue to provide a false colouring to the near-infrared band. The Explorer platform has additional tools available for use in the interface, to restyle and colour the basemap using the 4 bands.



b. Once the basemap is displaying on screen over Sydney, click on the enhance Imagery button on the right-hand side of the screen, to find additional image options to change contrast, brightness and saturation.

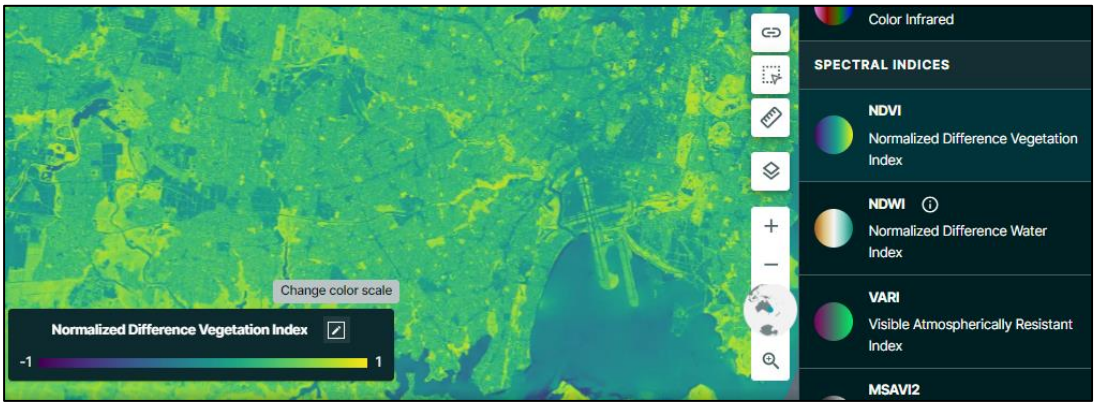


c. Click the next icon, “Perform spectral analysis”, to view spatial indices available.

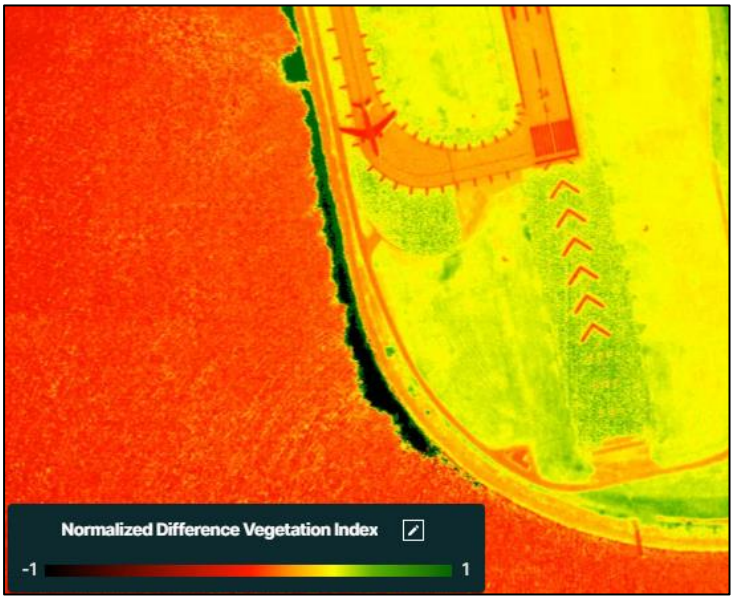


d. Select ‘RGB” to view the true colour (red, green, blue) version of the basemap.

e. Click on a spectral index option to view the basemap displayed in false colour consistent with a known band equation. An option will appear to change the colour scale on the bottom left. Please note that the colouring is for visual analysis purposes only. Measuring tools (described earlier) can be used to extract information, however, individual pixel information is not available in this interface. For pixel and band information please contact the team to receive the GeoTIFF mosaic files: Spatial.imagery@environment.nsw.gov.au.



Using this tool is a great start for quickly understanding information in the basemap mosaic images, and can denote that you will need to undertake further analysis, or request a higher resolution image.



9. Next steps

After viewing the imagery in Planet Explorer, you may wish to download the GeoTIFF tiles or task a higher resolution image. If you would like to place a request, or would like more information about imagery available, please contact: Spatial.imagery@environment.nsw.gov.au.

Further resources

Planet have online resources to help you explore documentation, references, tutorials, and tools, including:

- Imagery specifications documentation
- Planet University
- Planet Community
- Developer Center
- Planet Developer School
- Open Source Tools

Accessing Planet

- User Guide: Planet Explorer
- User Guide: Basemaps Viewer
- User Guide: Planet Stories
- Integrations: Imagery in ArcGIS
- Integrations: ArcGIS Plugin Download
- Integrations: QGIS

Videos & Webinars

- Using Planet Tile Services in ArcGIS Online
- ArcGIS One Minute to Integrations
- Analysing a Flood Event in ArcGIS Pro
- Get started with Planet CLI: searching for data
- QGIS One Minute to Integrations
- Analysing a Flood Event in QGIS

Tutorials: Using Planet Tools

- Viewing a Flood Event with the Planet Explorer ArcGIS Pro Add-In
- Viewing a Flood Event with the Planet Explorer QGIS Plugin

Planet Community

- Forum - Start discussions, ask questions, get answers
- Ideas - Submit ideas and suggestions to improve Planet's Data and Tools
- Product Announcements - Read the latest news from Planet's product team

Planet Social Media

- LinkedIn
- Twitter
- Instagram
- Planet Pulse

Bonus material

How to add Planet Imagery Scene Web Services into ArcGIS Online

There are two ways to use Planet imagery in ArcGIS Online (AGOL):

1. Adding Planet Basemaps (WMTS)
2. Adding PlanetScope Individual Scenes (XYZ Tiles)

Requirements:

- Internet access & web browser
- Planet account (for API Key and finding Scene ID)
- ArcGIS Online (AGOL) or ArcGIS Enterprise Portal account
- Ability to edit a URL (MS Word, notepad or notes will be sufficient)

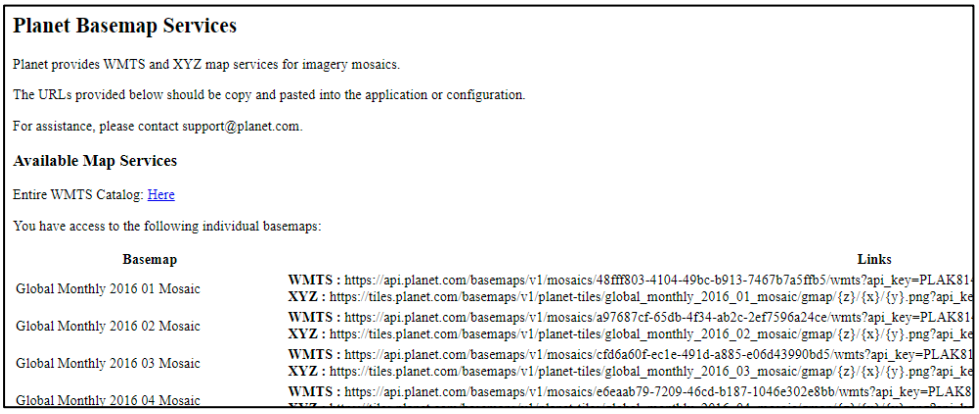
Adding Planet Basemaps (WMTS)

1. **Web service URL format**
    a. We will be using Planet's The Basemap Tile Service, which allows for visualisation of Planet imagery Basemaps in desktop or web mapping applications that support either the XYZ or the WMTS protocols. There are two URLs to use to find the specific Basemap WMTS URLs:
        i. **Basemap WMTS Catalogue Webpage**: https://api.planet.com/basemaps/v1/services?api_key={api-key} Navigate to this page in your browser to view all Basemap WMTS and XYZ available.
        ii. **Basemap WMTS Catalogue Access Request Structure**: https://api.planet.com/basemaps/v1/mosaics/wmts?api_key={api-key} This can be pasted into a Desktop GIS program (e.g., ArcMap or MapInfo) to display the entire WMTS Catalogue available with the current subscription.

2. **API Key**

    a. A valid Planet account is required to authenticate web services by providing a valid api_key as a query parameter. To find your api_key please login to https://www.planet.com/account/ in a new web browser.
    b. Navigate to *My Settings* > Copy API key.

    c. Replace {api-key} in the URL above (step 1 a. i.) with your copied API key. Then paste the URL into a browser.
    d. Use the list to find a basemap of your choice. For example:



Planet Basemap Services

Planet provides WMTS and XYZ map services for imagery mosaics.

The URLs provided below should be copy and pasted into the application or configuration.

For assistance, please contact support@planet.com.

Available Map Services

Entire WMTS Catalog: Here

You have access to the following individual basemaps:

Basemap	Links
Global Monthly 2016 01 Mosaic	**WMTS :** https://api.planet.com/basemaps/v1/mosaics/48fff803-4104-49bc-b913-7467b7a5ffb5/wmts?api_key=PLAK81 **XYZ :** https://tiles.planet.com/basemaps/v1/planet-tiles/global_monthly_2016_01_mosaic/gmap/{z}/{x}/{y}.png?api_ke
Global Monthly 2016 02 Mosaic	**WMTS :** https://api.planet.com/basemaps/v1/mosaics/a97687cf-65db-4f34-ab2c-2ef7596a24ce/wmts?api_key=PLAK81 **XYZ :** https://tiles.planet.com/basemaps/v1/planet-tiles/global_monthly_2016_02_mosaic/gmap/{z}/{x}/{y}.png?api_ke
Global Monthly 2016 03 Mosaic	**WMTS :** https://api.planet.com/basemaps/v1/mosaics/cfd6a60f-ec1e-491d-a885-e06d43990bd5/wmts?api_key=PLAK81 **XYZ :** https://tiles.planet.com/basemaps/v1/planet-tiles/global_monthly_2016_03_mosaic/gmap/{z}/{x}/{y}.png?api_ke
Global Monthly 2016 04 Mosaic	**WMTS :** https://api.planet.com/basemaps/v1/mosaics/e6eaab79-7209-46cd-b187-1046e302e8bb/wmts?api_key=PLAK8

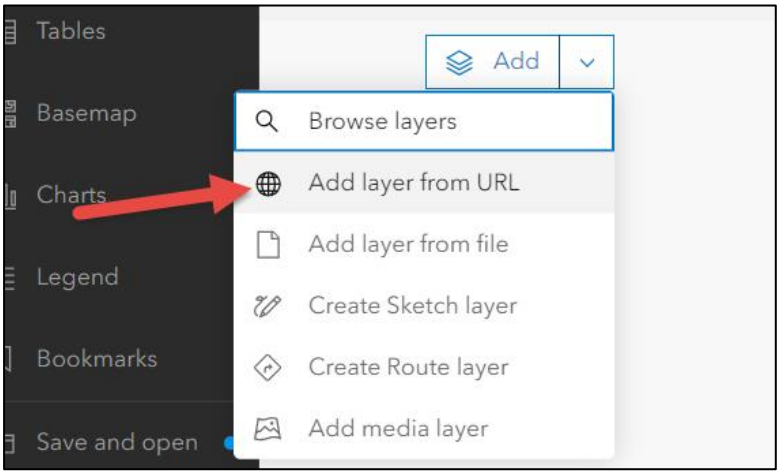
Global Monthly 2023 05 Mosaic (global_monthly_2023_05_mosaic), using a fake API Key, would be: https://api.planet.com/basemaps/v1/mosaics/43a480ec-11bd-41bd-af03-987a325a01e6/wmts?api_key=PLAK123456789

3. Add to ArcGIS Online

a. Open ArcGIS Online (http://www.arcgis.com/home/index.html) or ArcGIS Enterprise Portal and login.

b. Open the Map Viewer window. You can use either the New Map Viewer or the Map Viewer Classic.

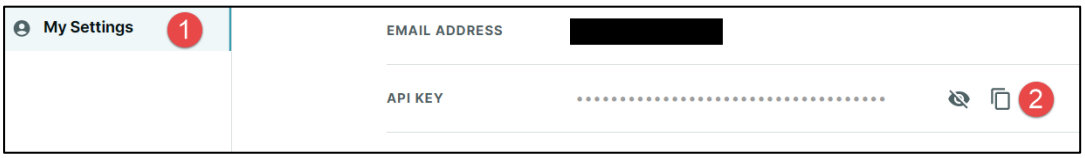
c. If using the New Map Window, please select Layers., then Add layer from URL.



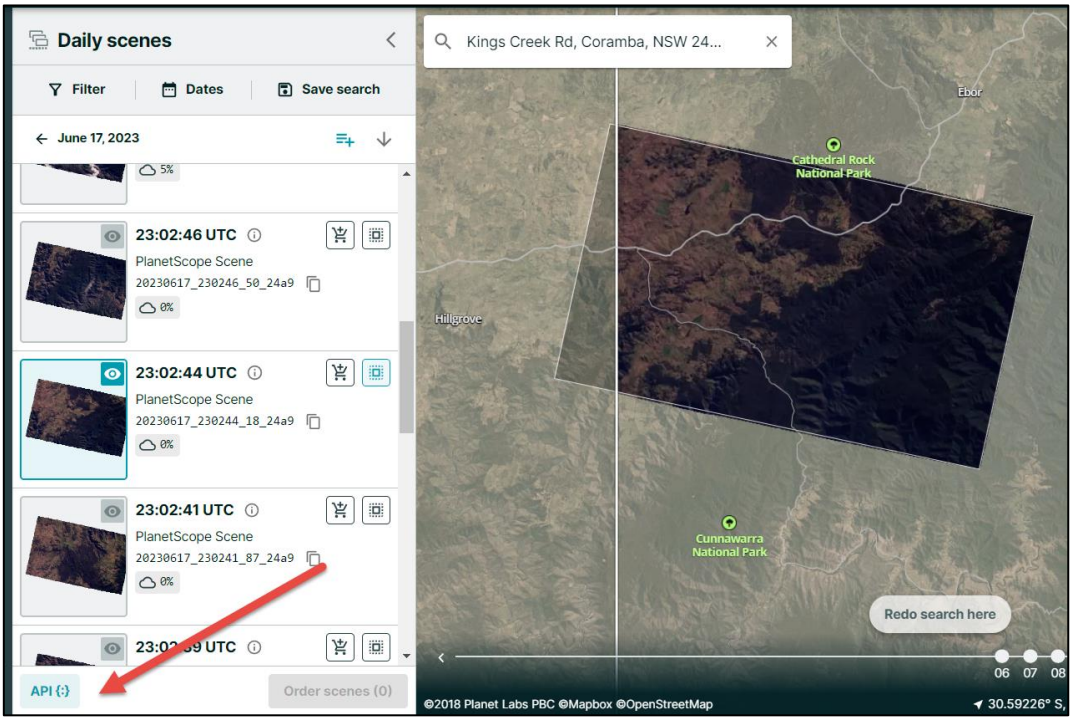
d. Add your Basemap URL copied in Step 2 c.

e. You can also paste the URL into your content page, following instructions here: https://doc.arcgis.com/en/arcgis-online/manage-data/add-files-as-items.htm Once added as items in your content, you can arrange into groups to display as custom basemaps (follow https://www.esri.com/arcgis-blog/products/arcgis-online/mapping/custom-Basemap-gallery/).

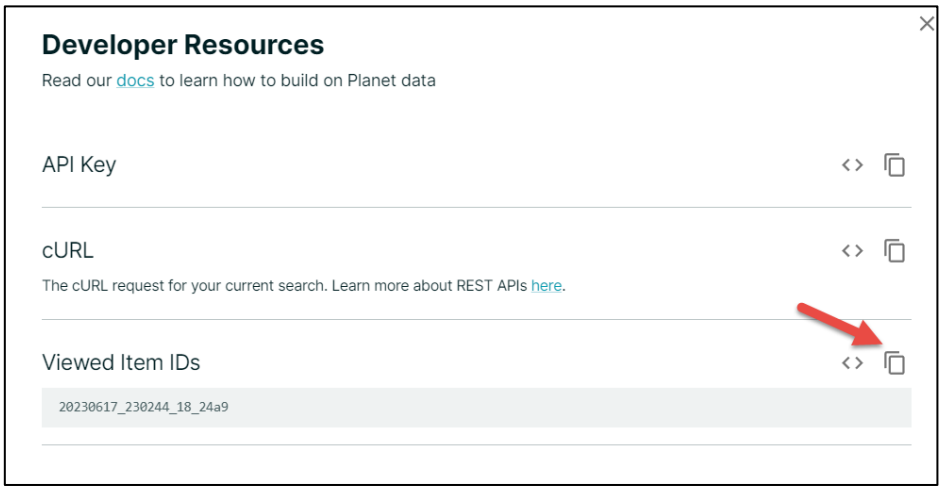
1. **Web service URL format**
    a. We will be using Planet's API Tile Service. Open a Microsoft Word document or notepad and copy or note down the following URL: https://tiles1.planet.com/data/v1/{item_type}/{item_id}/{z}/{x}/{y}.png?api_key={api-key}
2. **API Key**
    a. A valid Planet account is required to authenticate web services by providing a valid api_key as a query parameter. To find your api_key please login to https://www.planet.com/account/ in a new web browser.
    b. Navigate to *My Settings* > Copy API key.



    c. Replace {api-key} in the URL above (step 1) with your copied API key.
3. **Scene ID**
    a. Next find your Scene ID for the image you wish to add into AGOL. You can use Planet Explorer, the ArcGIS Pro Add-in or QGIS Plug-in (if applicable) to find the IDs for the selected imagery items. Today we suggest using Planet Explorer by logging into: https://www.planet.com/explorer/
    b. Search the Explorer interface for a Scene. For more information please see: https://developers.planet.com/docs/apps/explorer/how-to-search-imagery/
    c. Select the image in the window and click on "API".



d. Copy the Selected Scene IDs

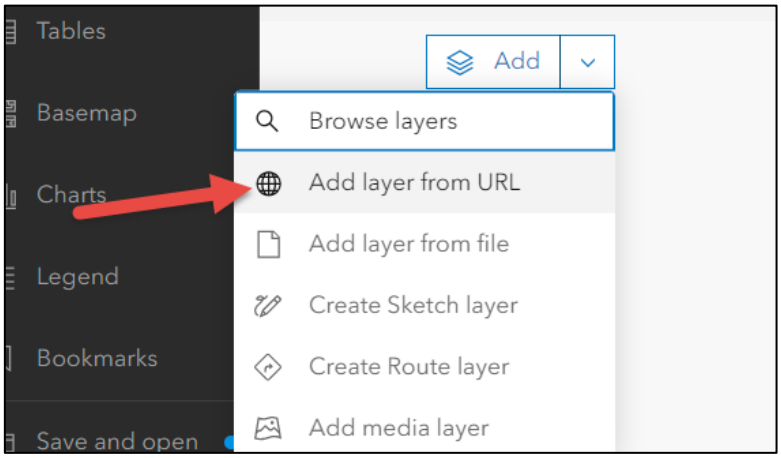


e. Replace {item_id} in the URL above (step 1) with your copied scene ID.
f. Next, update the {item_type} with the item name i.e. “SkySatCollect” for the mosaic, or “SkySatScene” for single items. For PlanetScope use "PSScene".

For example:
https://tiles1.planet.com/data/v1/PSScene/20230617_230244_18_24a9/{z}/{x}/{y}.png?api_key={api-key}

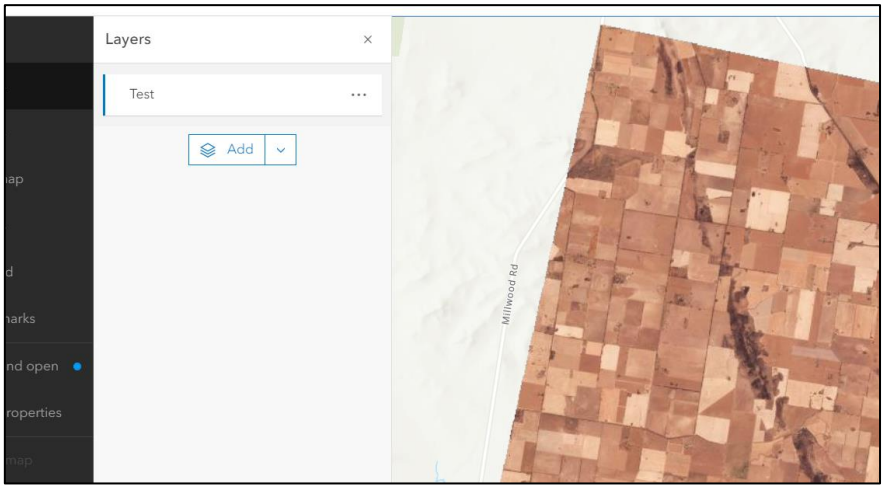
4. Add to ArcGIS Online

a. Open ArcGIS Online (http://www.arcgis.com/home/index.html) or Portal and login.
b. Open the Map Viewer window. You can use either the New Map Viewer or the Map Viewer Classic.
c. If using the New Map Window, please select Layers., then Add layer from URL.

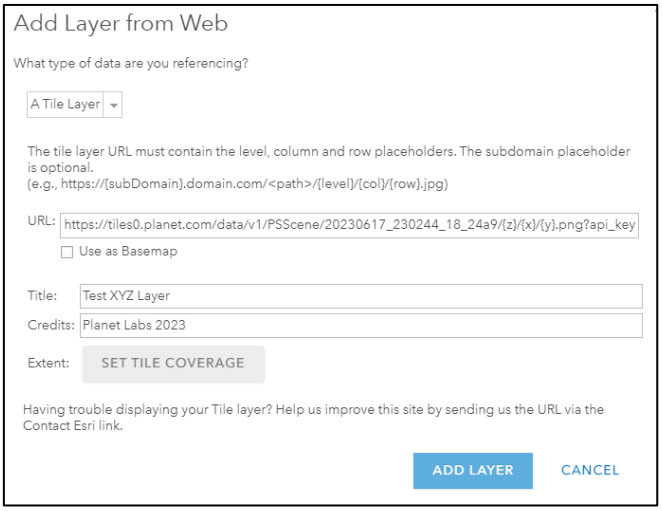


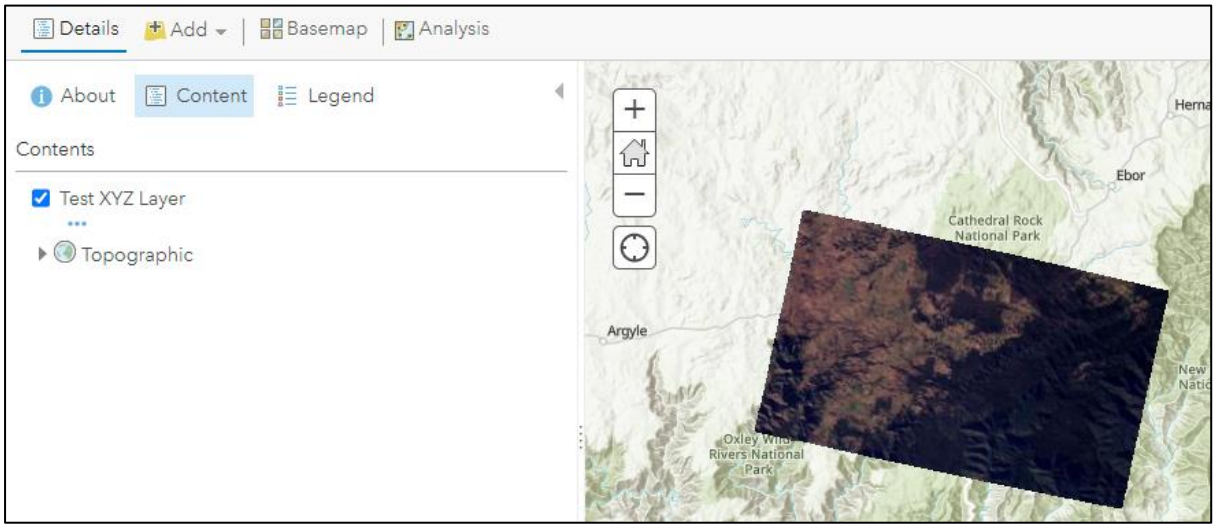
d. Add your newly created URL and select the type as “Tile Layer”.

e. Fill in the Name, Attribution, and other options.
f. Once added to the map zoom in to the image.



g. If using the Map Viewer Classic, please select “Add Layer from Web” and then select “A Tile Layer” from the drop down.





- Please note that Esri has limited functionality for saving XYZ tile layers into the Catalog for sharing with other groups, and requires uses to add XYZ services into maps directly.
- Further information on adding XYZ tile layers can be found here: https://esribelux.com/2021/04/16/xyz-tile-layers-in-arcgis-platform/
- We recommend this Tile Service approach over exporting the service from the Esri ArcGIS Pro Add-in or QGIS Plugin, as those services contain a token that expires. This option above will not expire as there is no token required.