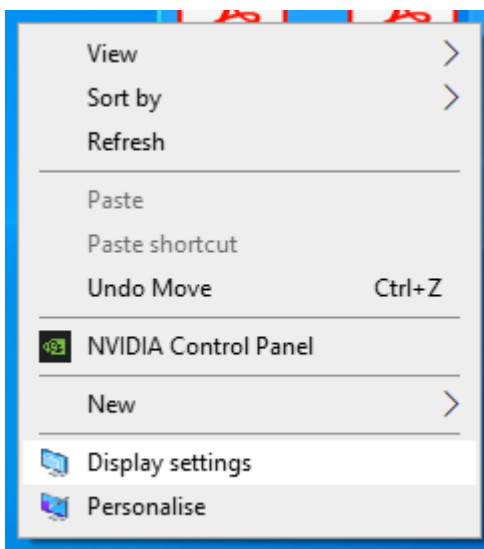


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1.1 Prior Setup

Before Launching CPC Standalone it is recommended to change the screen Display Settings scale to 100%



Scale and layout

Change the size of text, apps and other items

1.2 Launch CPC

Launch



1.2.1 Create Project



+ CREATE

ACCOUNT

> SUPPORT

CREATE PROJECT

APP REFRESH

PROJECT DETAILS

NAME

OUTPUT UNIT OF MEASURE

OUTPUT COORDINATE SYSTEM

SITE

PLATFORM

DRONE

AIRPLANE

OTHER

DISK USAGE

Existing Project Usage: **0.40 GB**

Available Space: **105.34 GB**


Enter the **Project Name** and **Output Unit of Measure**. There is no need to enter the **Output Coordinate System** as it is easier to get this automatically by dragging and dropping the images into the images area below.

1.2.2 Import Images

Drag and drop the images into the images area. You can also drag and drop the GCP's (in txt, csv or gcp format) and the GPS Log file (if the images are not georeferenced).

You will need at least 10 images to create a project. This small project only has 11 georeferenced images and 2 GCP's.

MAP | IMAGES | BROWSE SELECTED: 0 | 0 ?



Drag and drop image, ground control, and GPS files/folders here, or [browse](#).

The **Output Coordinate System** will be automatically created, depending on what is in the EXIF (metadata) of the Images.

PROJECT DETAILS

NAME: Sample CPC Project Tasmania

OUTPUT UNIT OF MEASURE: Meter

OUTPUT COORDINATE SYSTEM: UTM zone 55S WGS 84 (EPSG:32755)

SITE: Sample CPC Project Tasmania

PLATFORM

DRONE

AIRPLANE

OTHER


DISK USAGE

Existing Project Usage: 0.40 GB

Available Space: 104.60 GB

Estimated Project Usage: 0.73 GB

1.2.3 Add Ground Control (GCP's)



mapbox | Leaflet | © Mapbox © OpenStreetMap Improve this map © DigitalGlobe

Included Image Excluded Image Ground Control Checkpoint

CLEAR FILES ADD GROUND CONTROL CREATE

If you have GCP's (ground control points) add the file with them now, using **Add Ground Control**. You could also have drag and dropped them into the images area after the images. If you successfully brought in the GCP's this way (check the screen to see if they appear) then select **Create**.

Add Ground Control Points:

LAND XML FILE TEXT FILE CRD/CRDB FILE MANUAL

CANCEL

Select **Text File**

Add Ground Control Points:

Coordinate Format

▼

northing/easting
 easting/northing
 latitude/longitude

Select **Latitude/Longitude**

Add Ground Control Points:

Drag/drop file onto this modal or **browse** to upload your **plain-text** Ground Control file.

Ground control points must be provided as a plain text file (.txt, .csv, or .gcp extension) in the following format:

<Name>,<Latitude>,<Longitude>,<Elevation>

For example:

Red X, -42.6857053, 98.5948348, 1008.521

Black Circle, -42.6852053, 98.5943248, 1009.423

Specify latitude and longitude in **degrees** to at least 7 decimal places. Specify elevation in **meters** with 2 decimal places of precision.

BROWSE

BACK

CANCEL

FINALIZE

Drag and drop to drop the sample text file

<input type="checkbox"/> Name	Date modified	Type	Size
Tasmania GCP CSV GDA94	5/05/2022 1:39 PM	Text Document	1 KB

```
Tasmania GCP CSV GDA94 - Notepad
File Edit Format View Help
anything, -42.68570532, 146.59483483, 1008.521
whats up, -42.68562691, 146.59480151, 1009.985
```

Add Ground Control Points:

Click a GCP below to mark it as a checkpoint. These will not be used in the Aerial Triangulation, but will be used for independent cross-validation of 3D accuracy. Leave a GCP blank to exclude it from the project:

Description	GCP	Checkpoint
anything	<input checked="" type="checkbox"/>	<input type="checkbox"/>
whats up	<input checked="" type="checkbox"/>	<input type="checkbox"/>

BACK CANCEL FINALIZE

If the file is in an acceptable format the GCP's will be identified (as above).

Change from **GCP** to **Check Point**, if relevant. **Finalize**

Confirm:

Can you see your reference points on the map? If not, you may need to change your projection.

NO YES

Check that the GCP's appear correctly in the Map image. Select **Yes**



Included Image Excluded Image Ground Control Checkpoint

CLEAR FILES ADD GROUND CONTROL CREATE

Select **Create**

1.2.4 Create Project

CONFIRM PROJECT CREATION

Zone: UTM zone 55S
Earth Model: WGS 84
Code: EPSG:32755
Unit of Measure: Meters

+ Advanced Fields (optional)

The coordinate system and unit of measure above are correct.

**I acknowledge that my imagery must be within 60° of nadir and have at least 50% forward/side overlap

CANCEL CREATE

Select **Advanced Fields (Optional)**

— Advanced Fields (optional)

Principal Point (mm)

xo:

yo:

Focal Length (mm)

Flight GPS Accuracy (meters)

X:

Y:

Z:

You can right click an image and check the properties to get the focal length, or enter this manually

Camera	
Camera maker	Canon
Camera model	Canon EOS 550D
F-stop	f/4.5
Exposure time	1/1250 sec.
ISO speed	ISO-100
Exposure bias	0 step
Focal length	20 mm
Max aperture	
Metering mode	Pattern
Subject distance	
Flash mode	No flash, compulsory
Flash energy	
35mm focal length	

Min Stereo Models Per Point

- Orbital Dataset
- Use Sparse As Dense
- Use Unreconstructed Cameras In Ortho

The coordinate system and unit of measure above are correct.

**I acknowledge that my imagery must be within 60° of nadir and have at least 50% forward/side overlap

Ensure **The coordinate system and unit of measure above are correct** is enabled then click on **Create**

1.2.5 Bundle Adjustment

SAMPLE CPC PROJECT TASMANIA APP REFRESH

IMAGE PRE-PROCESSING View 05/09/22

DETAILS

Imagery Source: CANON EOS 550D

Images: 11 (32.5 MB) 1% 1%

Ground Control Points: 2

Enabled Notifications: Errors Completion Progress

BUNDLE ADJUSTMENT 15% 05/09/22

Now, wait until the **Initial Processing** takes place

1.2.6 Correct Ground Control Points

Reference points ready for correction.

Sample CPC Project Tasmania is ready for correction.

Correct Reference Points

IMAGE PRE-PROCESSING View 05/09/22

DETAILS

Imagery Source: CANON EOS 550D

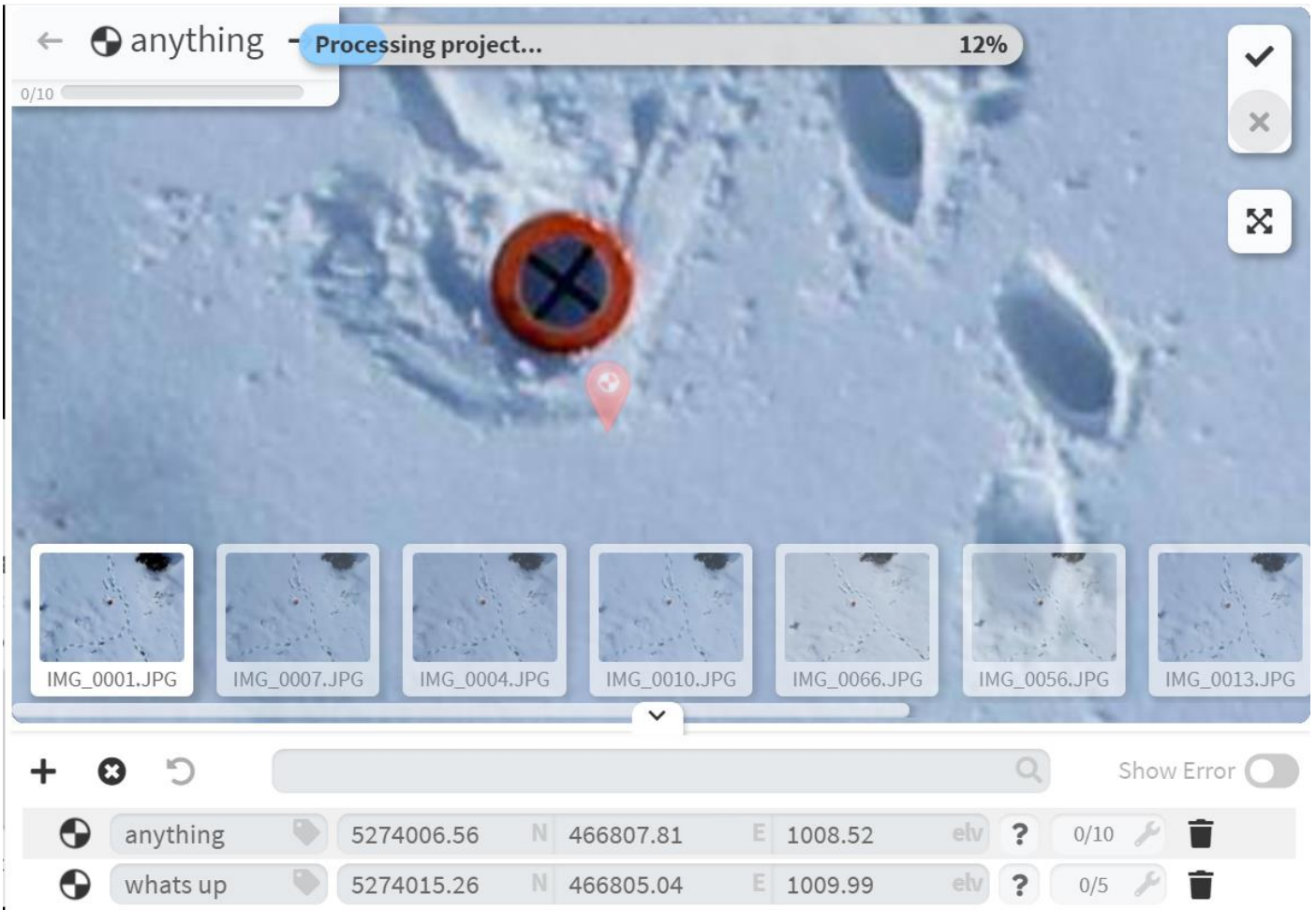
Images: 11 (32.5 MB) 1% 1%

Ground Control Points: 2

Enabled Notifications: Errors Completion Progress

BUNDLE ADJUSTMENT Correct 73% 05/09/22

This message indicates that the GCP's are now ready to be manually corrected. Select **Correct**



The best way to correct a GCP is to centre your mouse cross hair onto the GCP and left-click



Cross hairs centred
+ left-click =



Next, right-click to correct another image (do this for at least 3 images per GCP). The first 2 images will be a few metres away but the 3rd one will be much closer



IMG_0007.JPG	IMG_0004.JPG	IMG_0010.JPG	IMG_0066.JPG	IMG_0056.JPG	IMG_0013.JPG	IMG_0063.JPG
--------------	--------------	--------------	--------------	--------------	--------------	--------------

anything	5274006.56	N	466807.81	E	1008.52	elv	?	6/10		
whats up	5274015.26	N	466805.04	E	1009.99	elv	?	0/5		


Select the next GCP and repeat the process for all of the GCP's

1.2.7 Process Project with Ground Control Points

CONFIRM PROCESS CHANGES

This will begin processing your project with the current reference point data.

PAUSE PROCESSING AFTER REFERENCE POINT COMPUTE

 Warning: We recommend tagging all visible appearances for each GCP as it can improve the quality of the aerial triangulation.
- anything only has 6/10 corrections approved.

CANCEL

PROCESS

Processing corrections... [Reprojection Error: 0.585 pixels] 0% Processing Project

SPARSE RECONSTRUCTION AND CAMERA ORIENTATIONS

Welcome to the **Processing Analyzer** tool!

Use this tool to understand the steps between initial images and final products. Once the bundle adjustment is close to finishing, you will see a sparse reconstruction of your scene here along with calculated cameras positions and orientations.

Some issues to look for that could indicate trouble in your project:

- Lines of drone positions at drastically different elevations.
- Jumbled or disoriented areas in the reconstructed sections.
- Large gaps of points where points are expected to exist.
- Large, non-uniform shifts in original camera positions to adjusted positions.

If any of these occur, expect the project to either fail or not produce quite the desired results. In these cases, the issue is *likely* due to input data that didn't meet the proper collection criteria.



NEXT

REFERENCE POINT CORRECTION ANALYSIS

Use this page to analyze GCP corrections and checkpoint accuracies.















A number of things to note:

- Reference points (GCPs and checkpoints) will be color-coded either **green** (good), **yellow** (borderline), or **red** (bad) in correspondence with how you have manually corrected it.
- If all reference points are **green** expect accurate data.
- Click a reference point to see which cameras view that reference point and see where it lies in 3D.
- Reprocessing the bundle adjustment after adding, deleting, or modifying existing reference points is free given that you pause to examine the results before processing the rest of the products.
- Reference points can be modified on completed products.

NEVER SHOW ME THIS AGAIN

PREVIOUS

GOT IT!

			<input type="text"/>		Show Error	<input checked="" type="checkbox"/>						
	anything		0.0004	ΔX	-0.0004	ΔY	-0.0246	ΔZ		6/10		
	whats up		0.0042	ΔX	0.0013	ΔY	0.022	ΔZ		5/5		

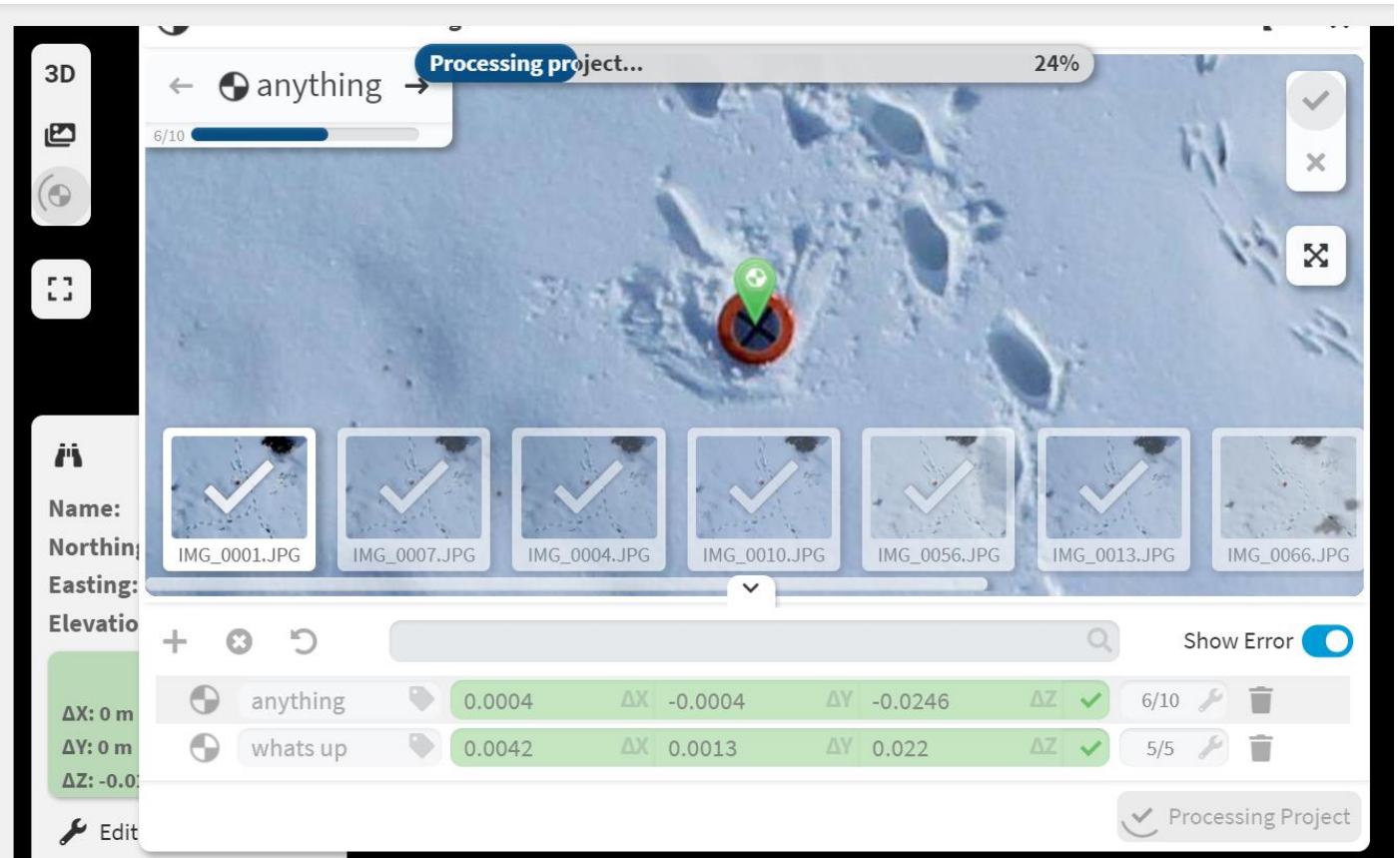
 Resume Processing

CONFIRM RESUME PROCESSING

Resume processing with the current GCP corrections.

CANCEL

RESUME



Once Completed close the Reference Point Manager



1.3 Output Products

▼ SITES

TILE VIEW

▼ Sample CPC Project Tasmania

▼ Sample CPC Project Ta...

Output Products

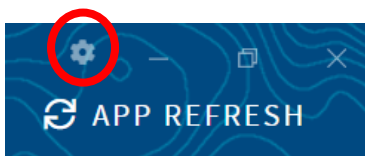
Processing Analyzer

Survey Canvas **NEW DENSE!**

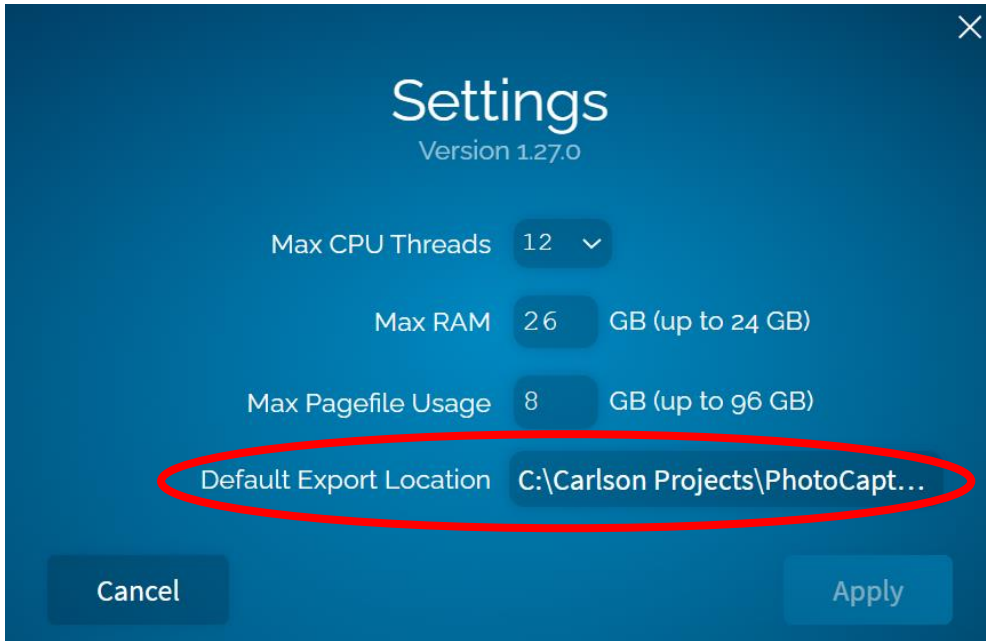
Admin

SAMPLE CPC PROJECT TASMANIA			APP REFRESH
IMAGE PRE-PROCESSING	View		05/09/22 11:18AM
BUNDLE ADJUSTMENT	View	Export	05/09/22 11:18AM
DENSE POINT CLOUD	View	Export	05/09/22 11:19AM
SURFACE MODEL	View	Export	05/09/22 11:19AM
DIGITAL ELEVATION MODEL	View	Export	05/09/22 11:19AM
ORTHOMOSAIC	View	Export	05/09/22 11:19AM
PROJECT REPORT		Export	05/09/22 11:19AM


The output products are automatically saved to the Default Export Location (this can be set by selecting **Settings**)



- DEM
- Dense Point Cloud
- Orthoimage
- Project Report
- Texture Mesh
- Adjustment Report



1.4 Processing Analyzer

▼  SITES


 TILE VIEW


▼  Sample CPC Project Tasmania

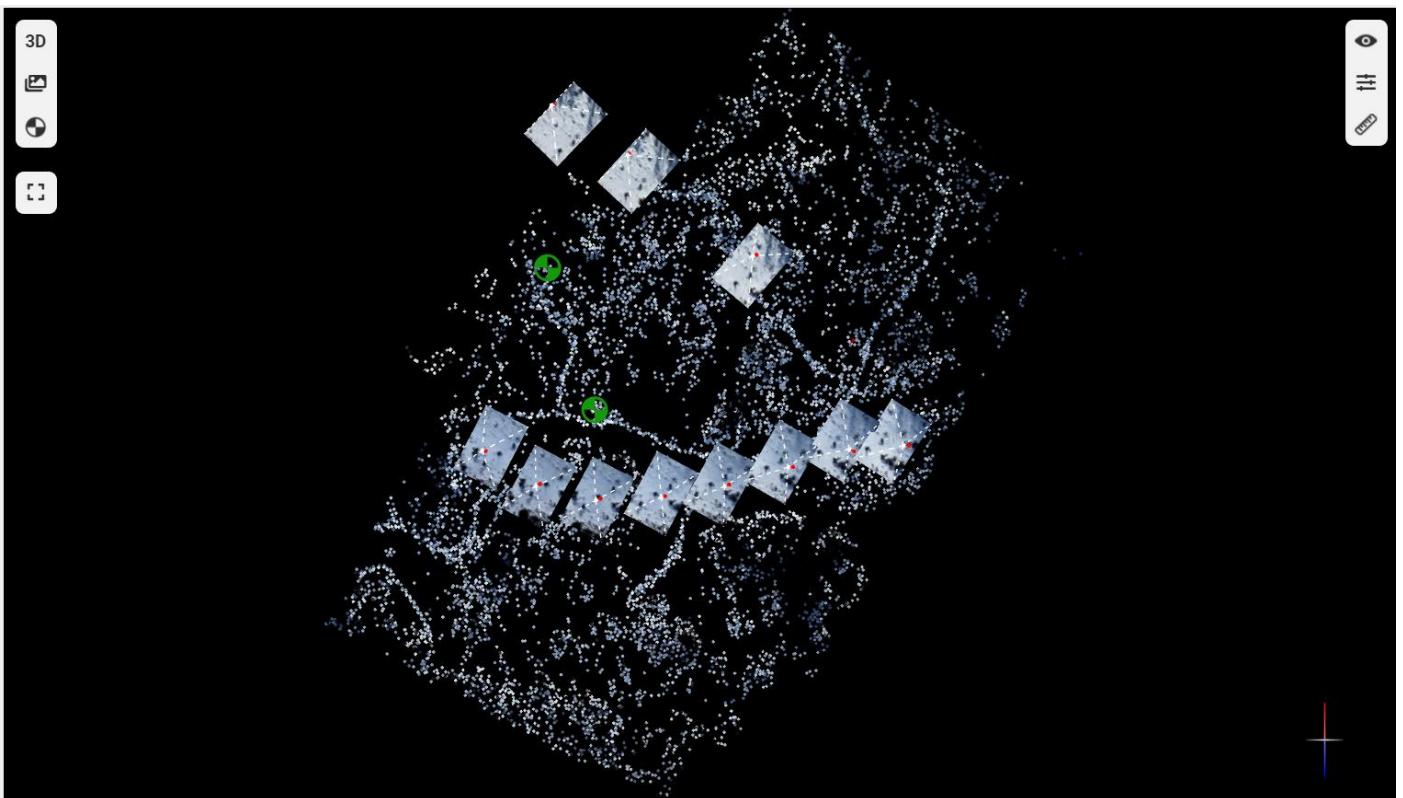
▼  Sample CPC Project Ta...

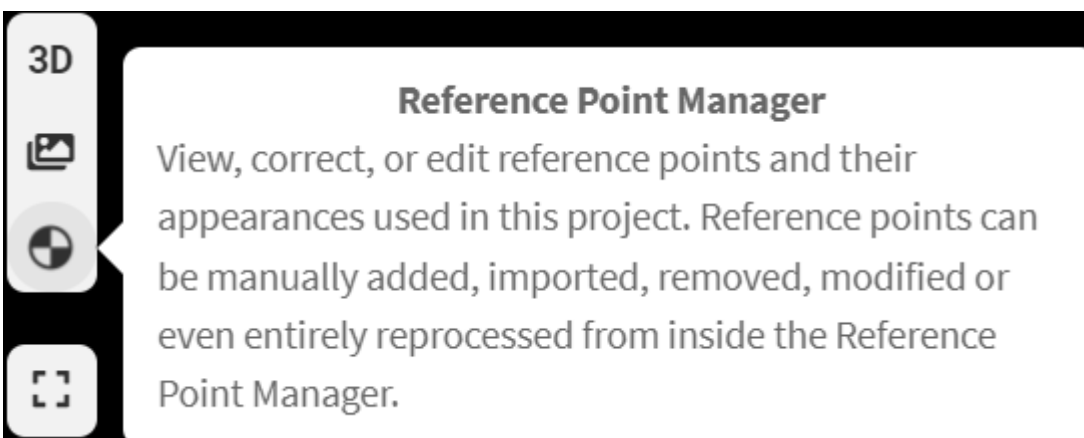
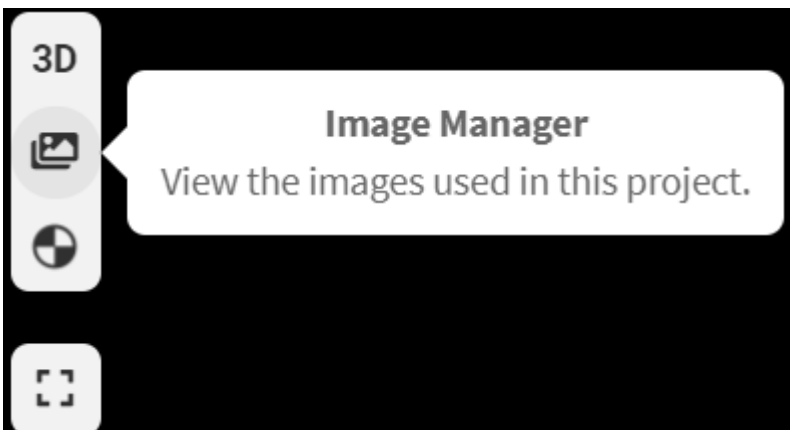
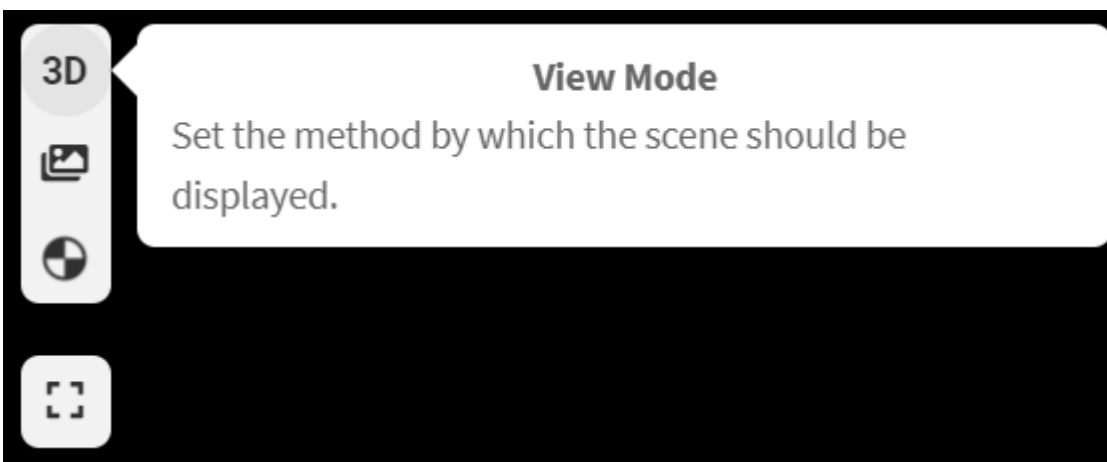
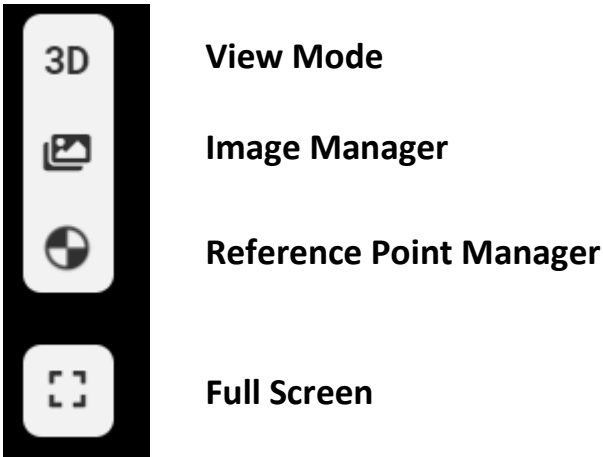
 Output Products


 Processing Analyzer

 Survey Canvas **NEW DENSE!**

 Admin







Fullscreen
Toggle the editor in and out of fullscreen.






Show




Display Settings

Units




Show
Toggle various visibilities.



Display Settings
Modify ground control point size and point rendering quality.



Units
Modify the units you wish to display.



1.5 Survey Canvas

▼  SITES


 TILE VIEW


▼  Sample CPC Project Tasmania

▼  Sample CPC Project Ta...

 Output Products

 Processing Analyzer

 Survey Canvas **NEW DENSE!**

 Admin

SURVEY CANVAS

Welcome to the **Survey Canvas** powered by Cesium!

Be aware that it may take a while to load the full surface model and that it will load in pieces. How long it takes to load is dependent upon your network speed.

Get started by mousing over buttons to see help tooltips.

 NEXT

NAVIGATION

Pan around by *left-clicking* and dragging your mouse.

Rotate the screen by *right-clicking* and dragging your mouse while in 3D mode.

Zoom in and out by *scrolling* the mousewheel or by clicking down the *scroll-wheel* and dragging your mouse while in 3D mode.

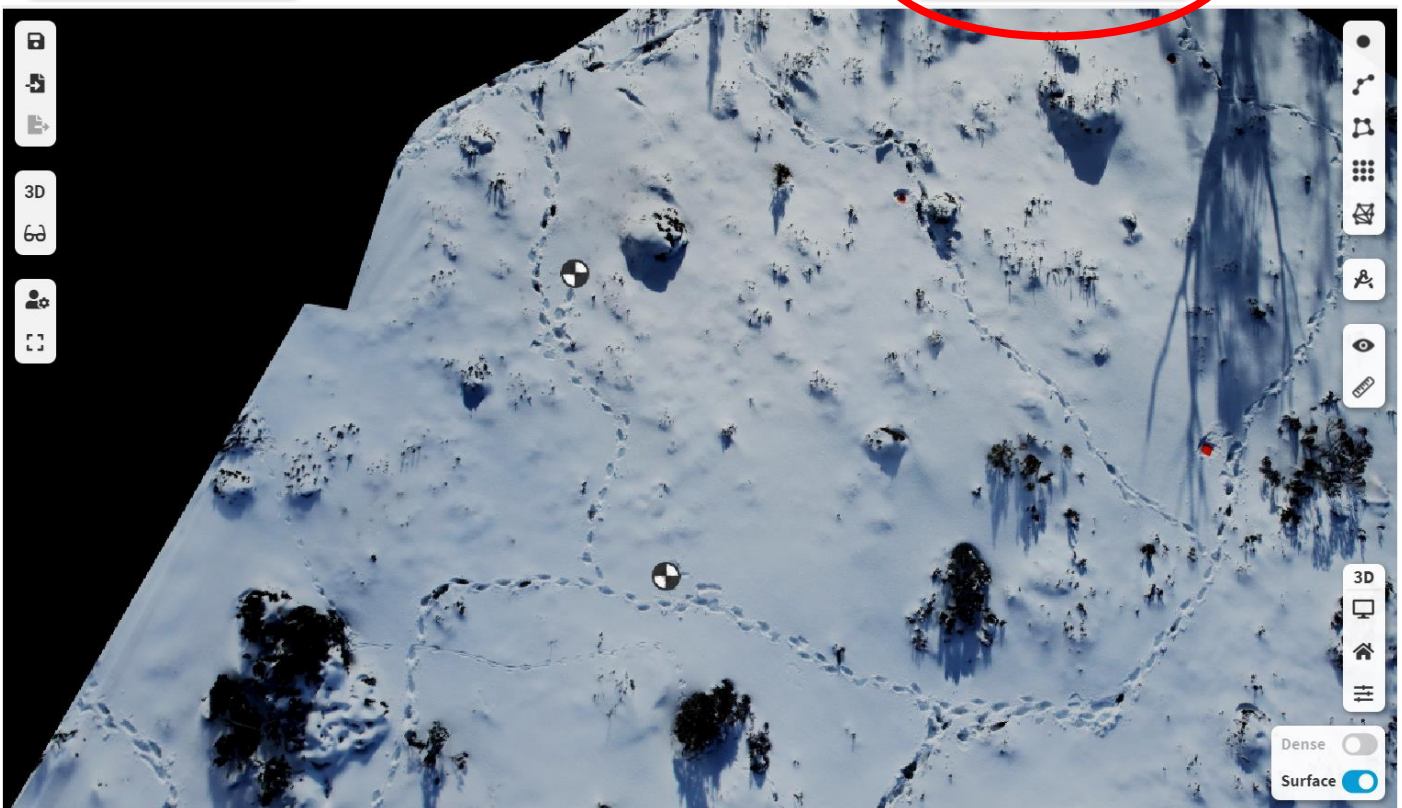
NEW DENSE! **Dense Point Cloud in Survey Canvas.** We unified the Dense Point Cloud Viewer and the Survey Canvas. Now you can see and edit your linework using the dense point cloud. Control the point cloud and/or mesh visibility from the *bottom right panel*.

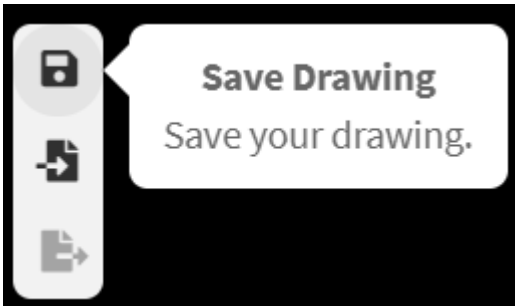


NEVER SHOW ME THIS AGAIN

PREVIOUS

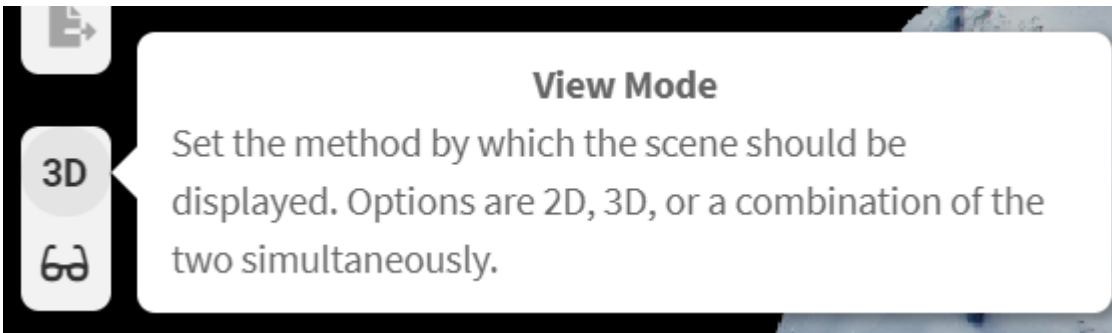
GOT IT!





Save Drawing

Import Drawing

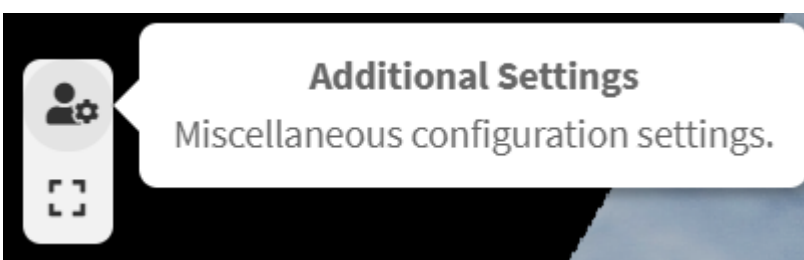


View Mode

Set the method by which the scene should be displayed. Options are 2D, 3D, or a combination of the two simultaneously.

View Options

Stereo Reconstruction

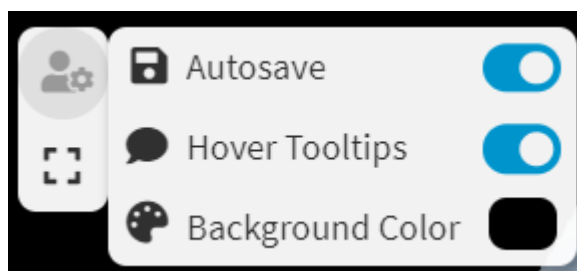


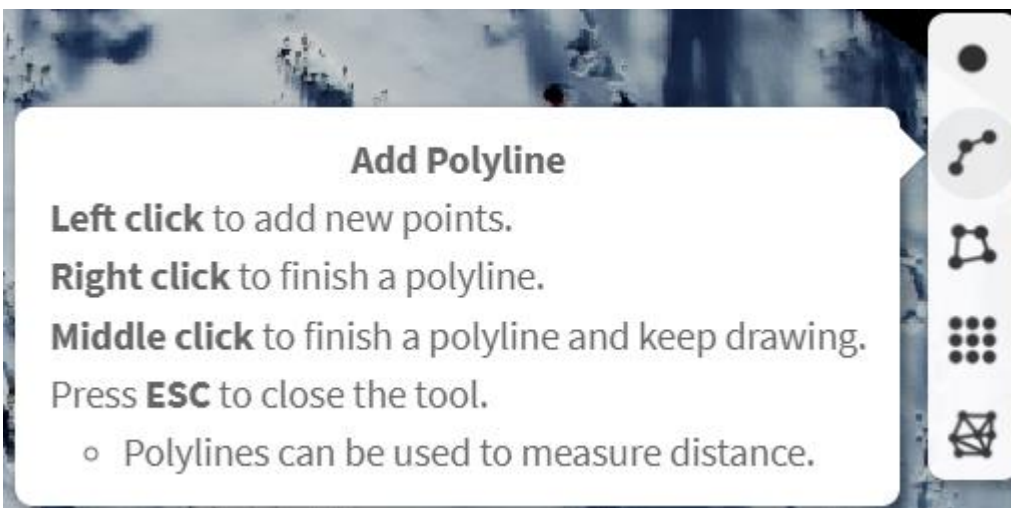
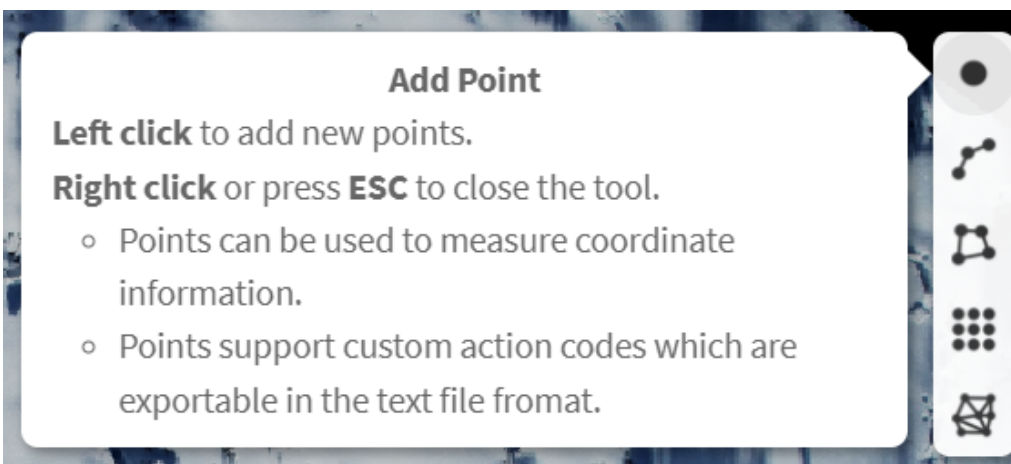
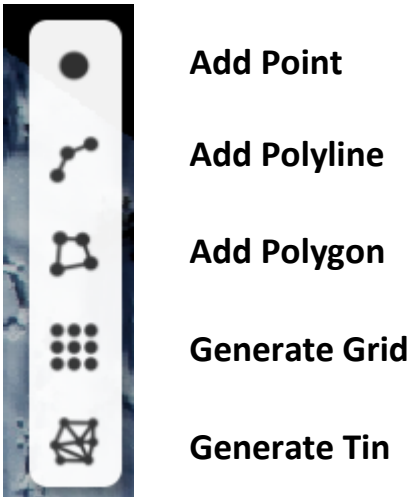
Additional Settings

Miscellaneous configuration settings.

Additional Settings

Full Screen





Add Polygon

Left click to add new points.

Right click to finish a polygon.

Middle click to finish a polygon and keep drawing.

Press **ESC** to close the tool.

- Polygons can be used to measure perimeter, area, and volume.

Generate Grid

Left click to add new points.

Right click or **middle click** to finish a grid outline.

Press **ESC** to close the tool.

- Grids can be triangulated to generate TINs.

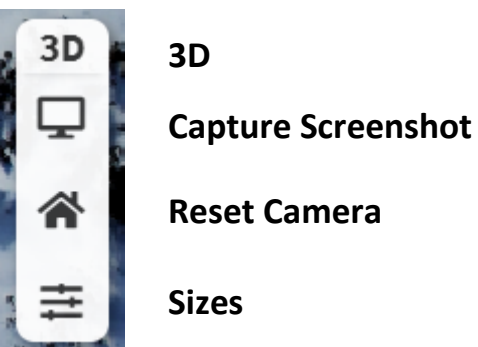
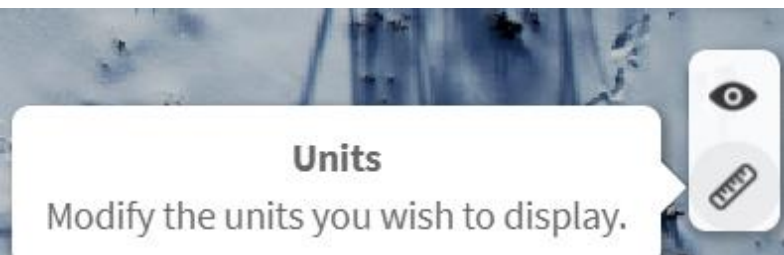
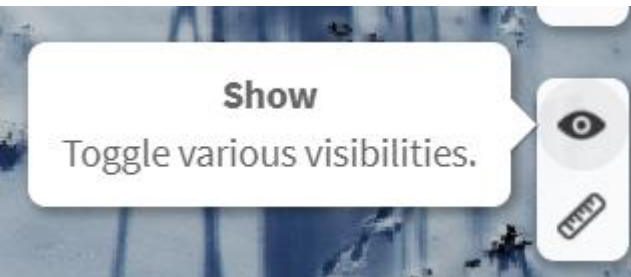
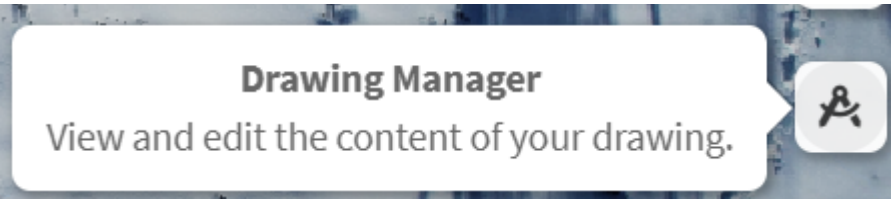
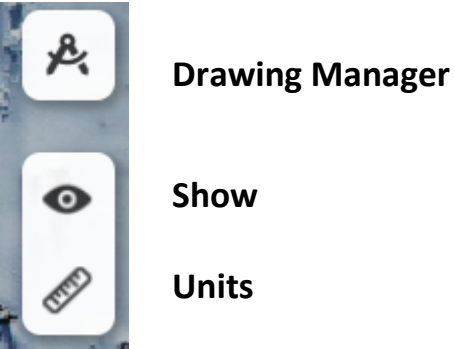
Generate TIN

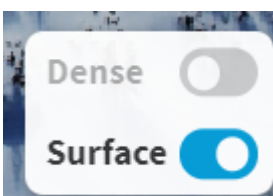
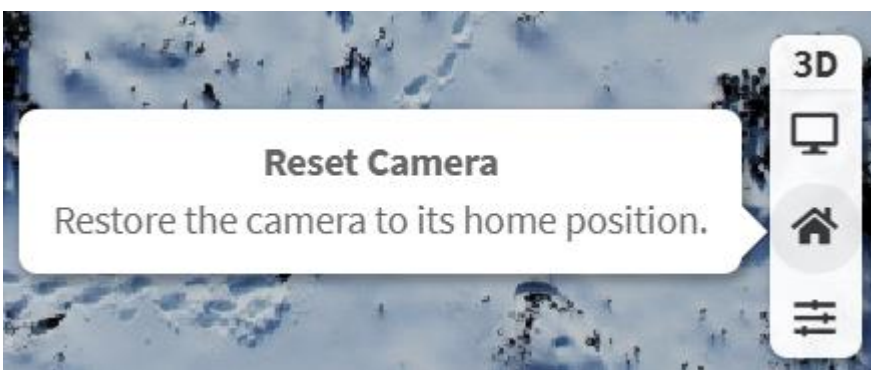
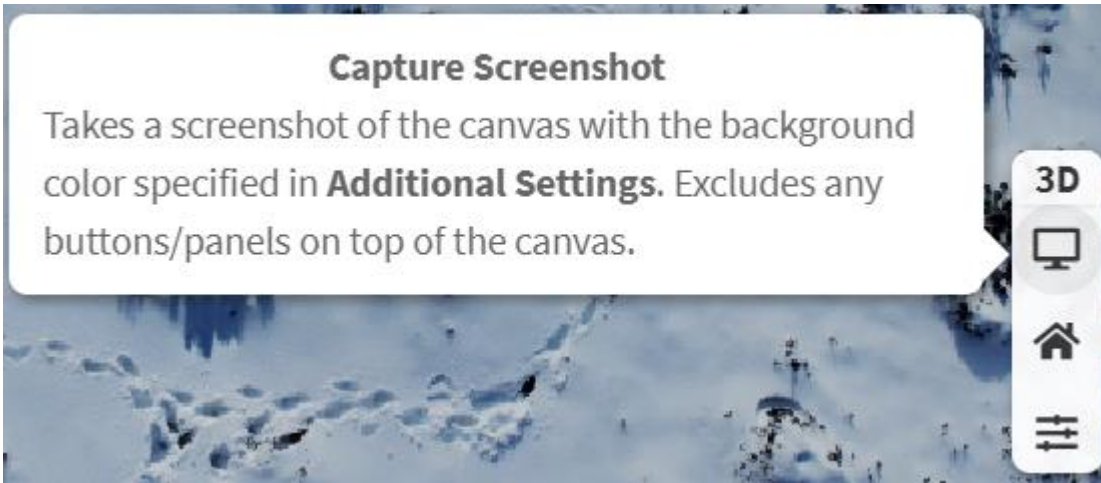
Select **Entire Surface** to generate a TIN from the entire surface model.

Select **Selection** to select specific features in the drawing.

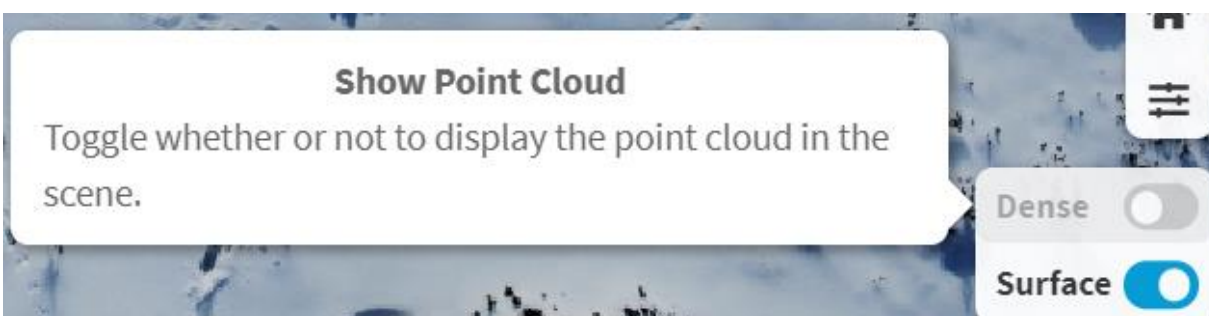
Press **ESC** to close the tool.

- TINs can be used to generate contour lines.
- TINs can be used to measure volumes.
- TINs can be edited after being generated to add holes, add breaklines, be flattened, be cropped, or be decimated.





Dense
Surface



Show Surface Model

Toggle whether or not to display the surface model in the scene.

Dense

Surface

1.6 Admin

▼ SITES

TILE VIEW

▼ Sample CPC Project Tasmania

▼ Sample CPC Project Ta...

Output Products

Processing Analyzer

Survey Canvas NEW DENSE!

Admin

PROJECT PROPERTIES



Date Created	05/09/2022 11:18AM	Images	11
Reference Points	4	Image Source	Drone
Coordinate System	EPSG:32755	Camera Make	CANON
Size on Disk	326.0 MB (Peak 1.5 GB)	Camera Model	EOS 550D

CLEAN PROJECT

Cleaning a project will delete all project data with the exception of project visualizations and drawing save files. You will still be able to work on your project in the survey canvas and dense point cloud, but will no longer be able to access the exports in the output products page. Be sure to save any project files you would like to keep on your hard drive or an external volume before cleaning a project.

Cleaning this project would free **169.8 MB** of space on disk.

CLEAN

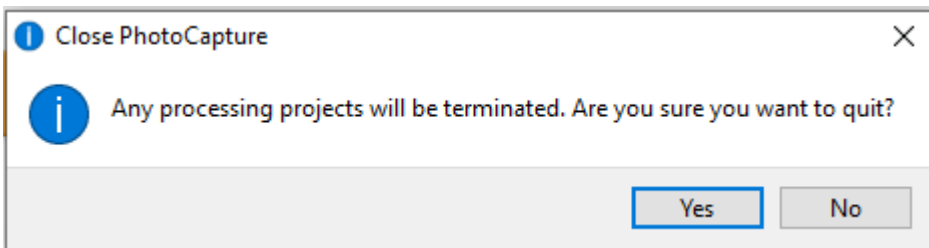
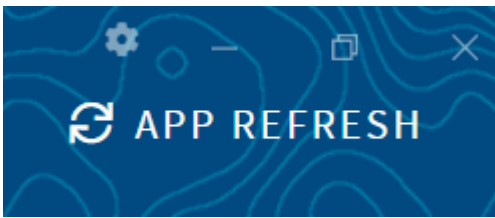
DELETE PROJECT

Deleting a project is irreversible and will erase all associated data off your local disk. Be sure to save any project files you would like to keep on your hard drive or an external volume before deleting a project.

Deleting this project would free **326.0 MB** of space on disk.

DELETE

1.7 Exit (Close Application)



If the project has completed processing, then select **Yes**

If not then Select **No** and wait for the processing to complete