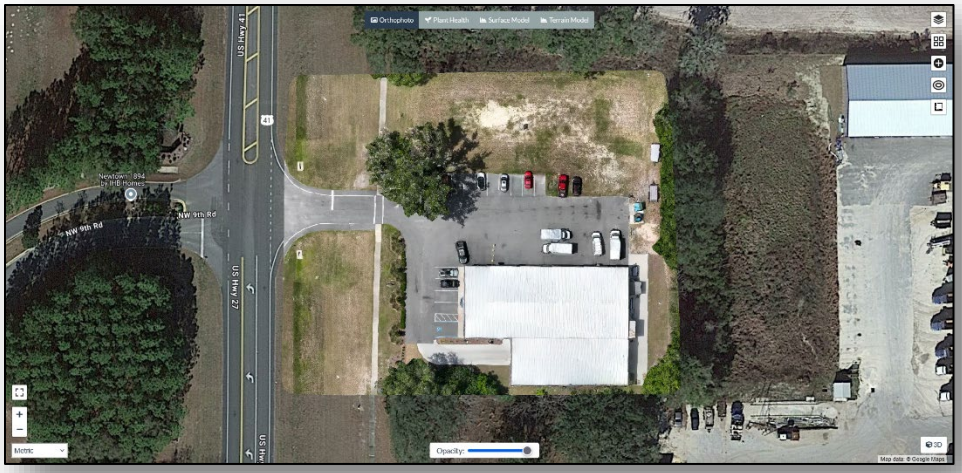
PEGASUS
DRONE SOLUTIONS

Viewer User Guide



2D Orthophoto Maps

3D Models

Preface

This guide is intended to familiarize our clients with the functionality of the viewers used to interact with their deliverables. Pegasus Drone Solutions utilizes OpenDroneMap / WebODM to process data and display images and models. As such, functionality may change with patches and upgrades. We will make every effort to update this document in a timely manner. However, if you discover errors or omissions, please inform us at info@pegasusdronesolutions.com.

Please Note: Some of the options or functionality may not be available depending on the deliverables requested.

Acknowledgements

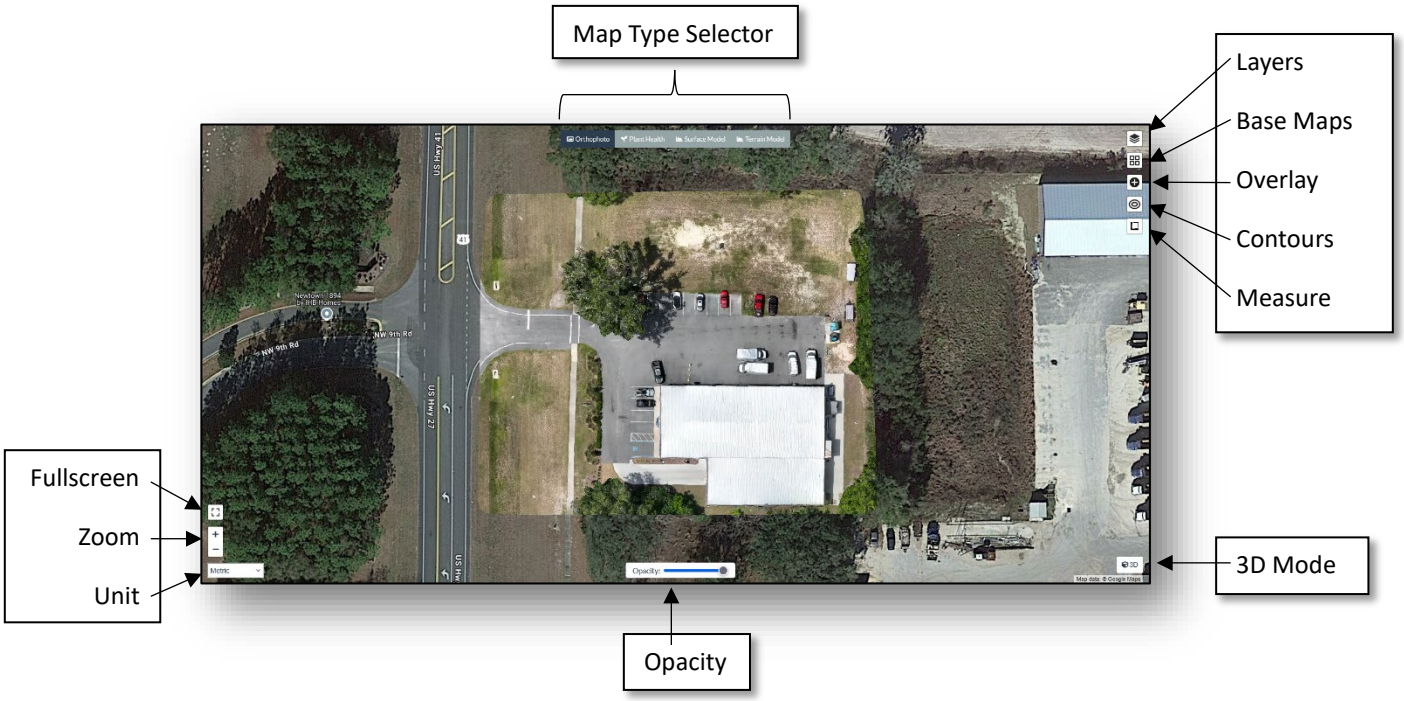
OpenDroneMap: https://www.opendronemap.org/

WebODM: https://www.opendronemap.org/webodm/

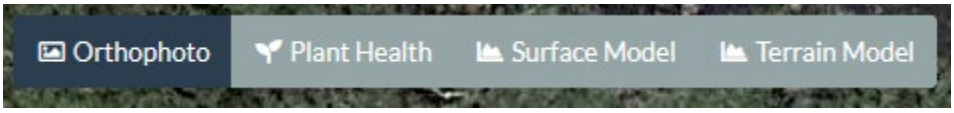
2D Orthophoto Map Viewer

The 2D Orthophoto Map Viewer is used to interact with the “stitched” together aerial images.

Overview

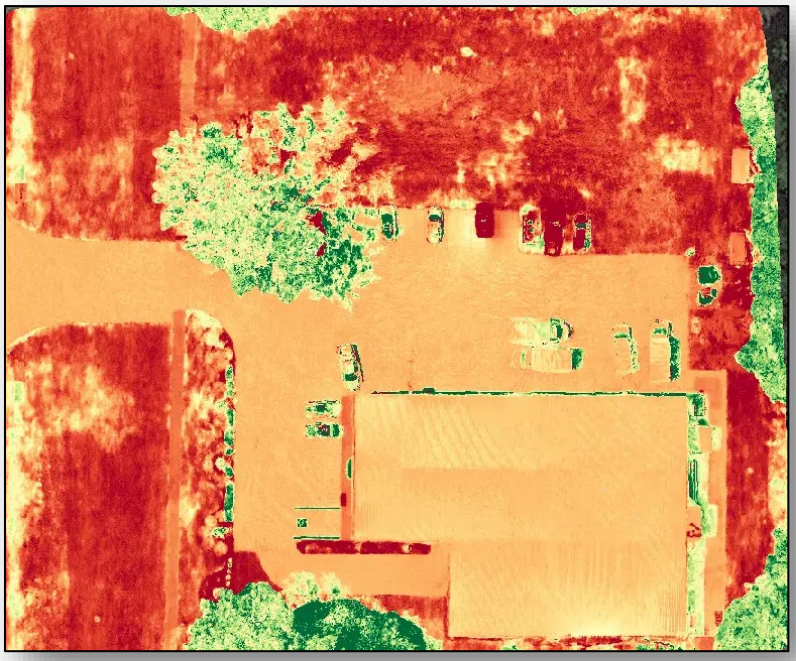


Map Type Selector

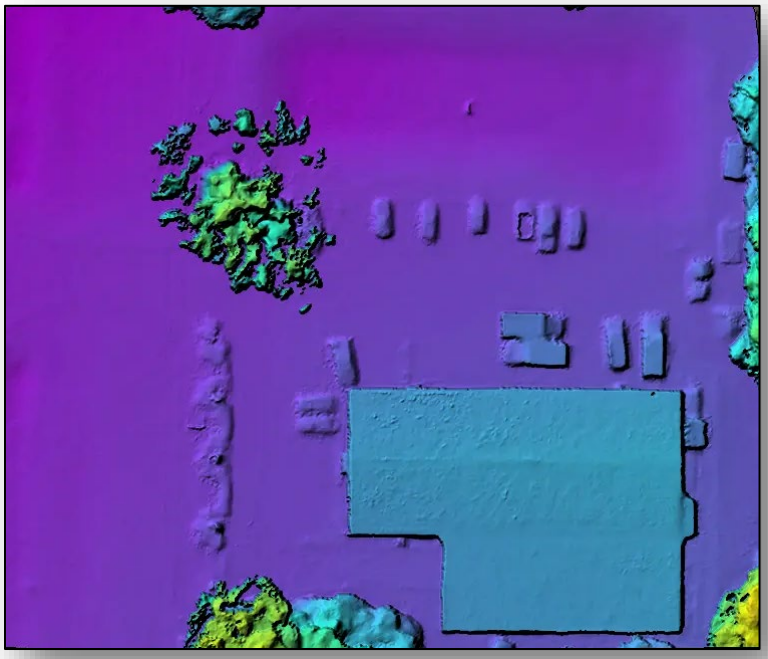


Orthophoto: Displays an orthomasaic image of a vertical view of the area.

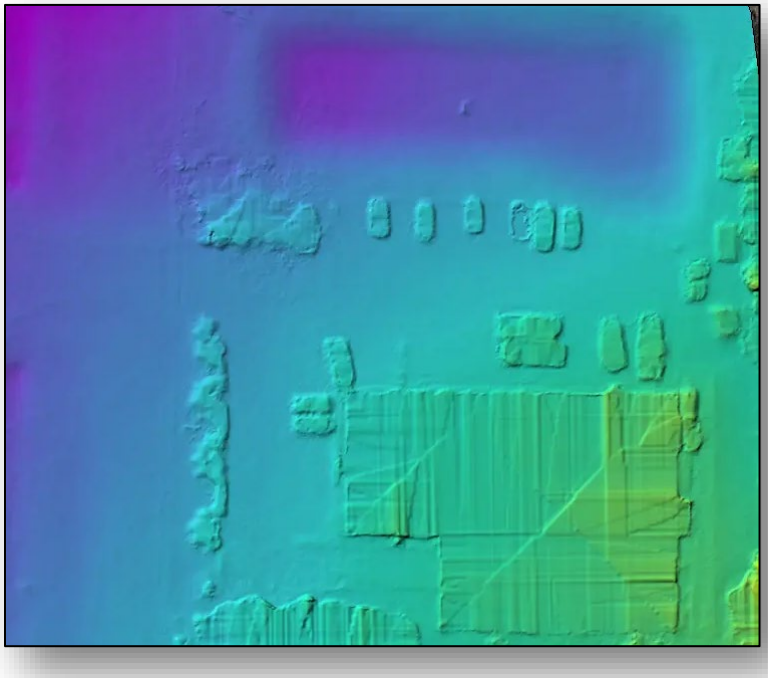
Plant Health: Displays an image depicting relative health of plants. This pertains to images captured with multispectral sensors. As of this writing, Pegasus Drone Solutions does not offer multi-spectral sensor deliverables.



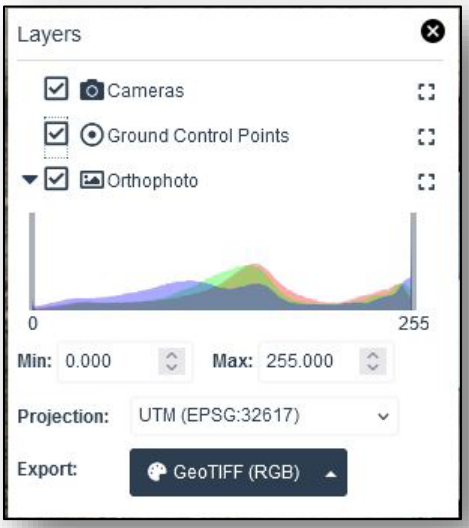
Surface Model: Displays a 2D representation of elevation that includes terrain, buildings, trees and other structures (DSM).



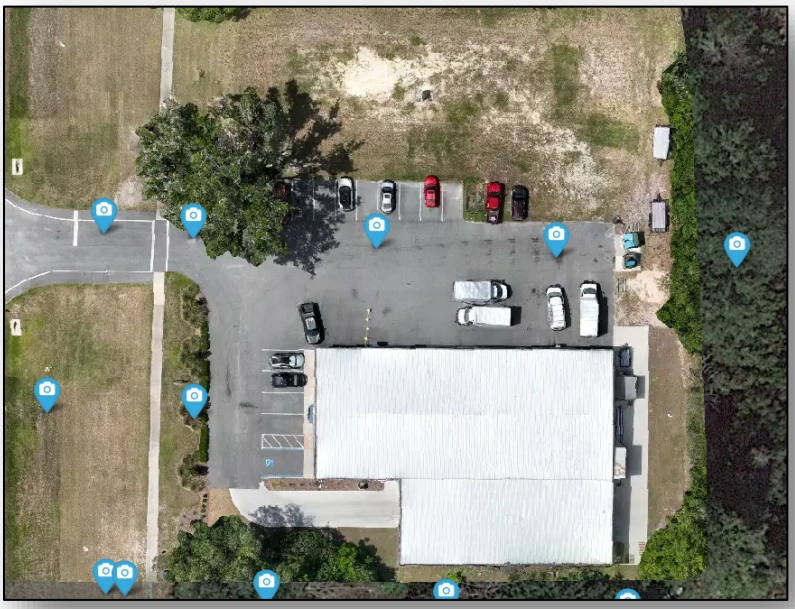
Terrain Model: 2D representation of elevation that includes terrain only (DTM).



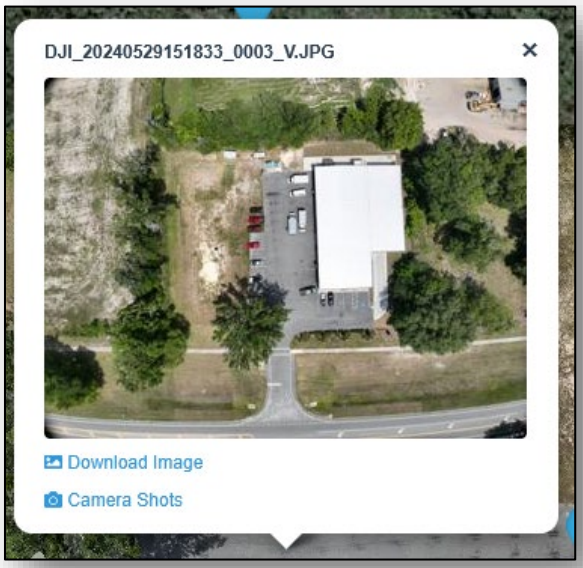
Layers



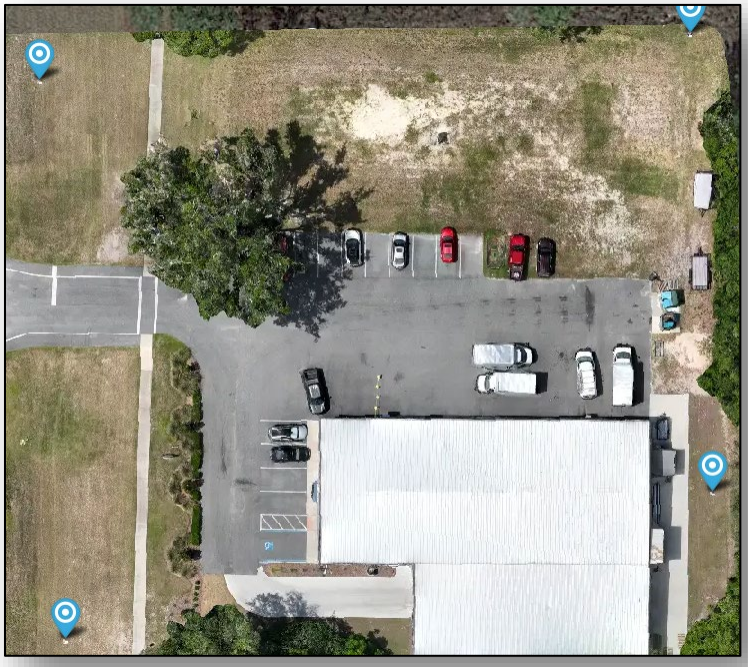
Cameras: Displays icons on the map indicating where the image was captured.



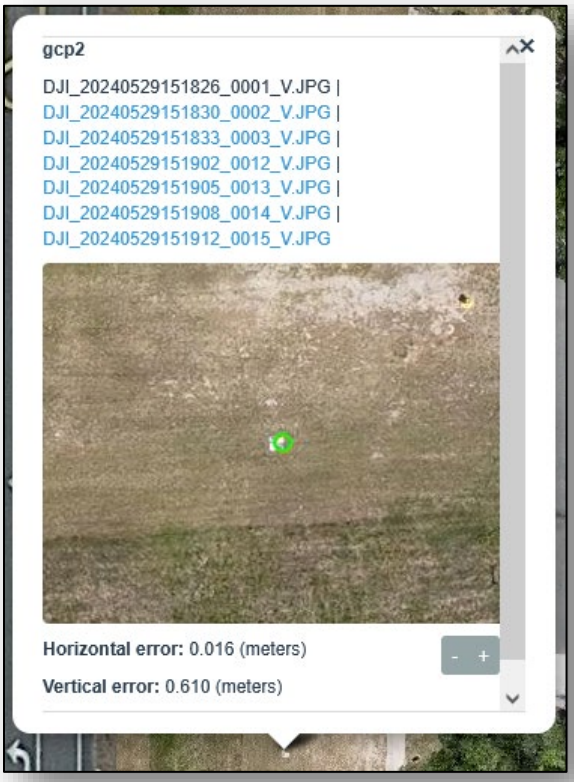
Clicking on an icon displays the image and permits downloading of the photo.



Ground Control Points: Displays icons on the map indicating where the ground control points were located.

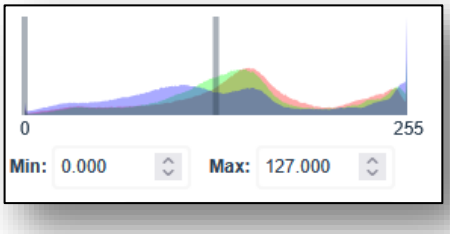


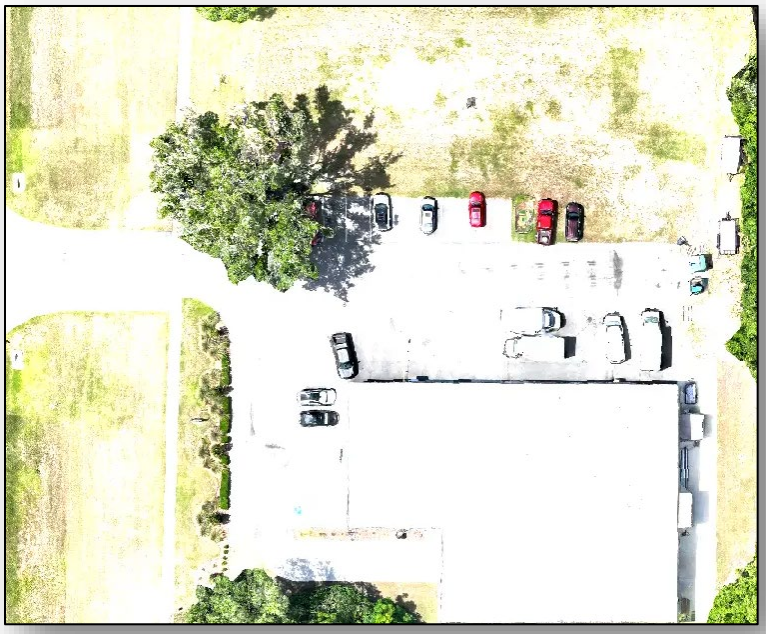
Clicking on an icon displays the list of images in which the point appears along with the calculated error value.

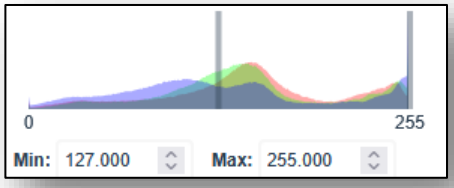


Orthophoto: Displays the orthomosaic photo.

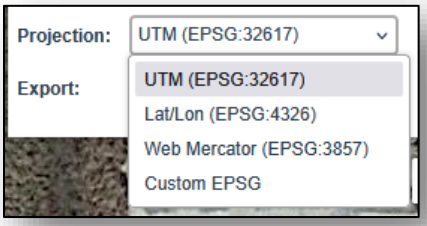
Color Histogram: Adjusting the Min / Max values (or sliders) changes the colors displayed in the orthophoto.

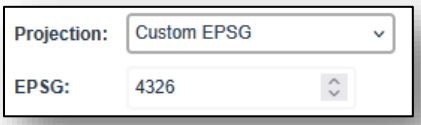




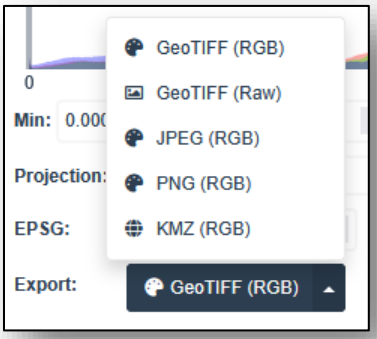

0
255
Min: 127.000
Max: 255.000

Projection: Allows one to change the coordinate system used for export between Universal Transverse Mercator, Latitude / Longitude, Web Mercator or to enter a different system.

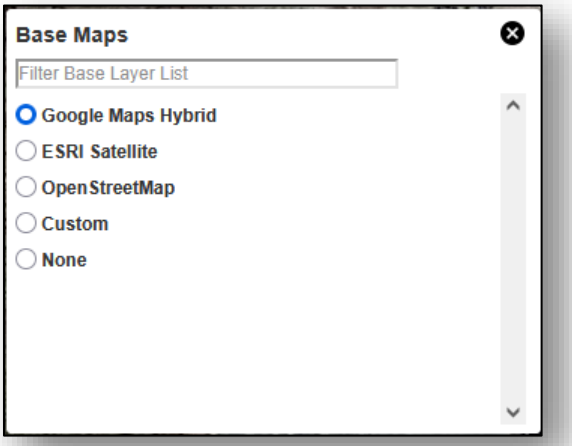




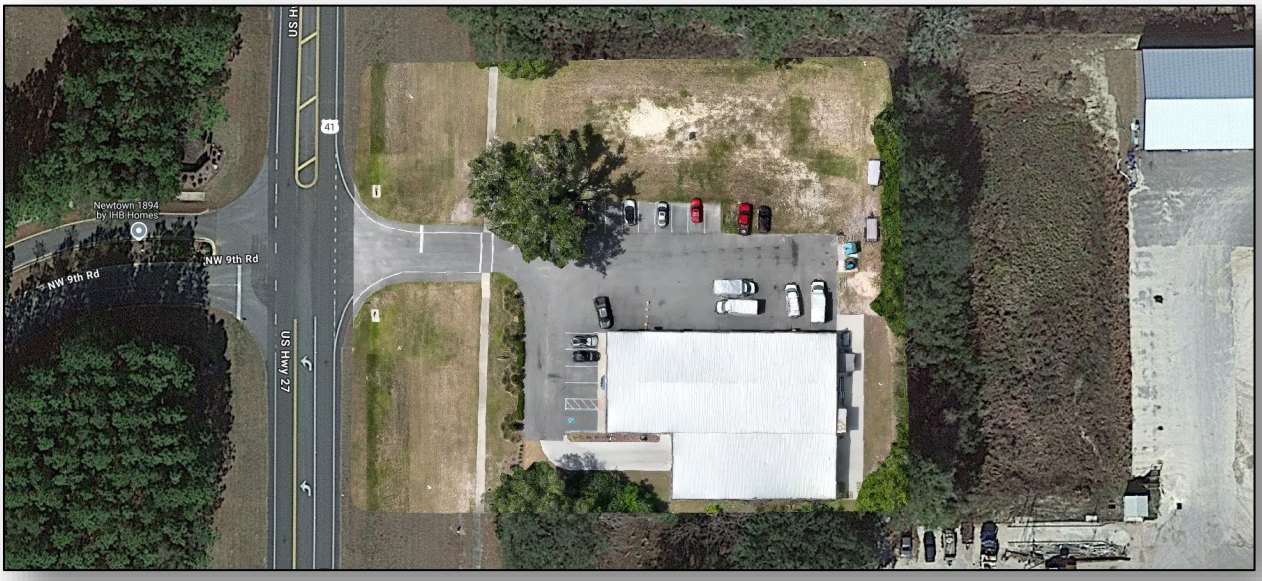
Export: Allows one to export the orthophoto in various formats.



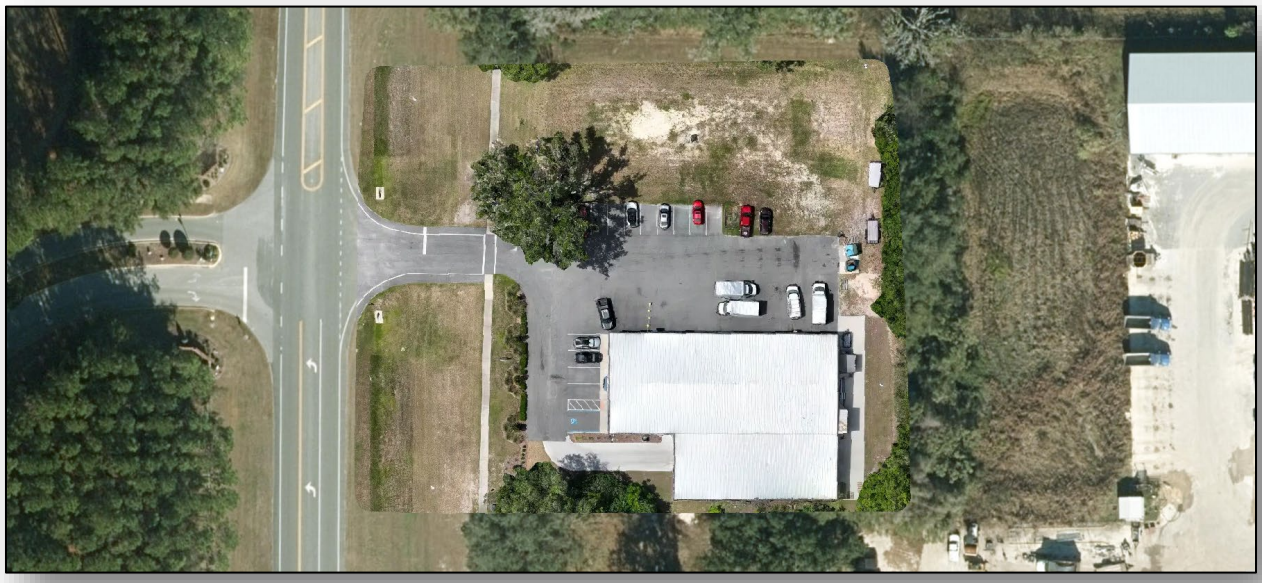
Base Maps



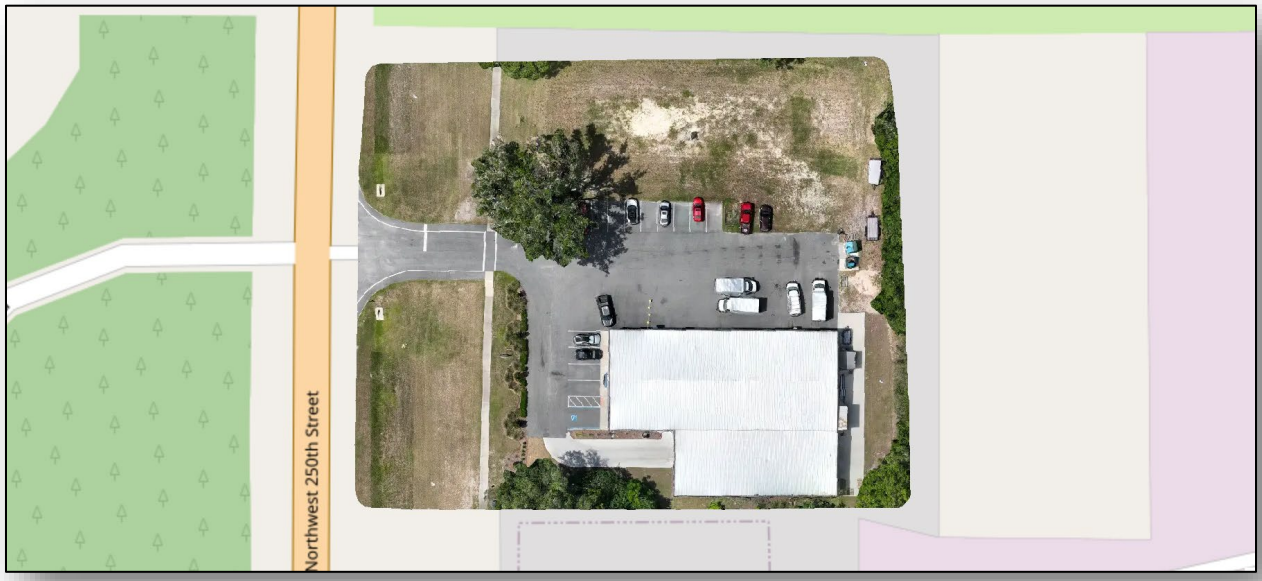
Google Maps Hybrid: Places a background image from Google Maps.



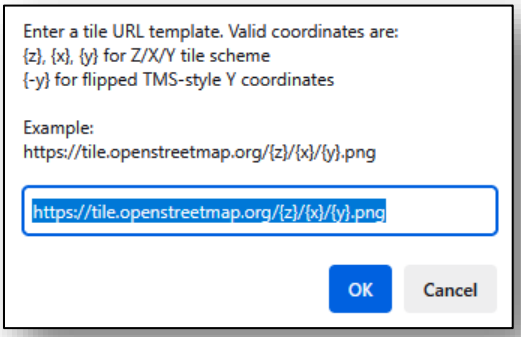
ESRI Satellite: Places a background image from Esri.



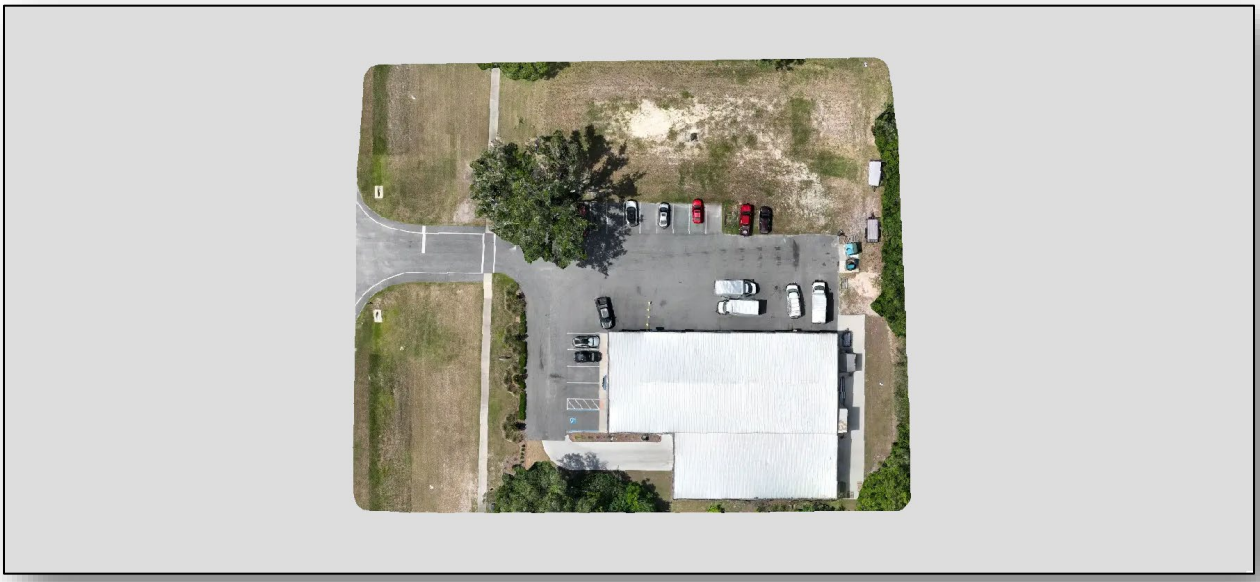
OpenStreetMap: Places a background image from Open Street Map.



Custom: Allows one to upload their own background image.

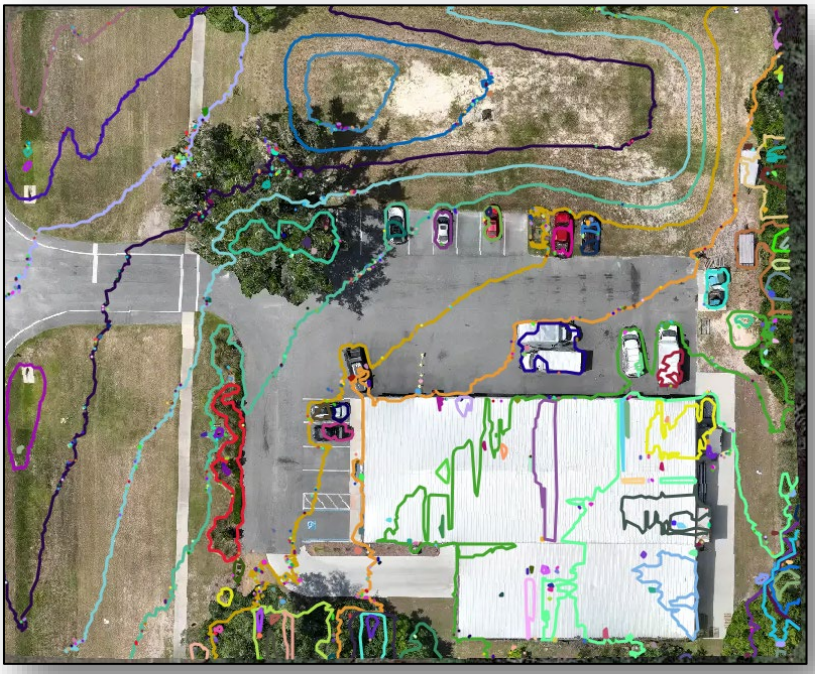


None: Removes the background image.

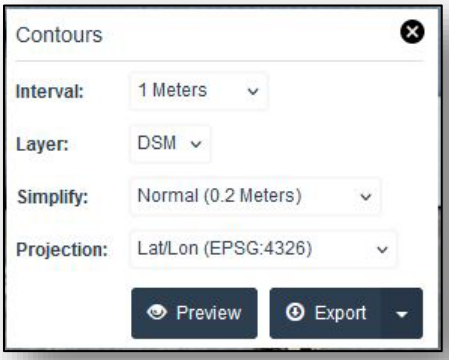


Overlay

Add a Temporary Overlay: Allows one to upload a GeoJSON (.json) or ShapeFile (.zip) as a temporary overlay.

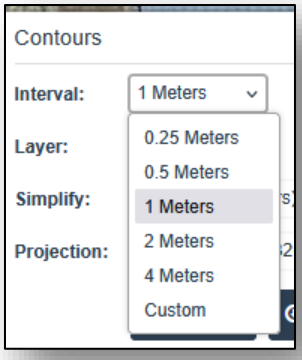


Contours

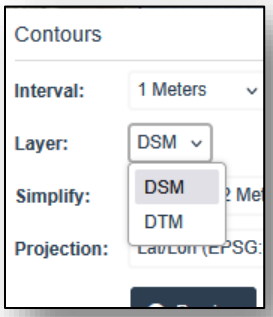


PLEASE NOTE: This is a quick/rough contour diagram. Our contour deliverables are custom (based on your requirements) and with finer details.

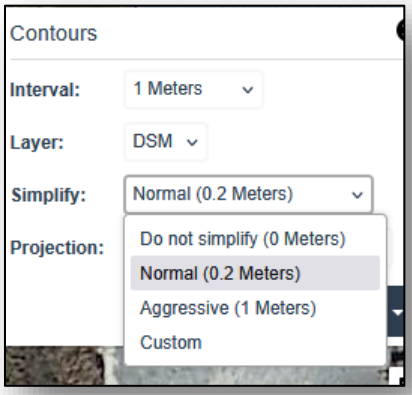
Interval: Set the height difference between contour lines.



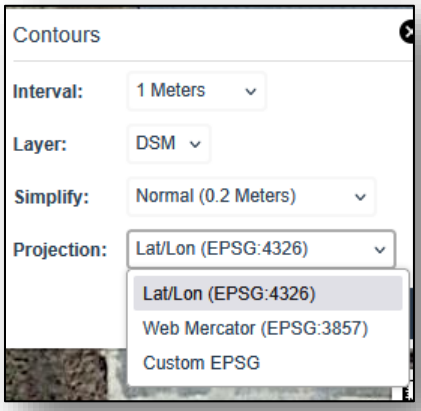
Layer: Heights may be based on the Digital Surface Map (DSM) or Digital Terrain Map (DTM).



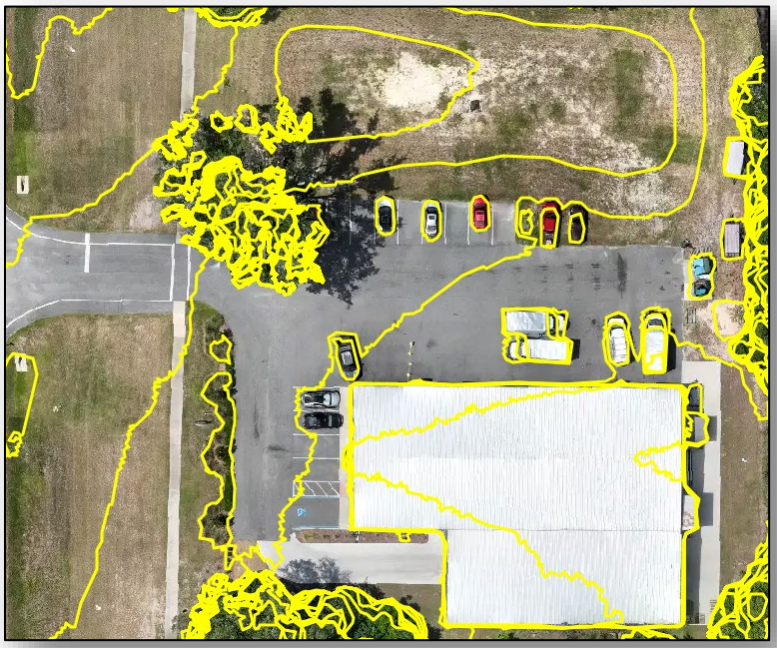
Simplify: Sets the "smoothing" of the contour lines.



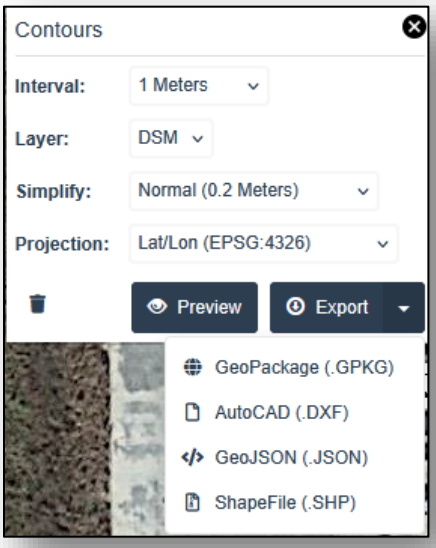
Projection: Choose the coordinate system projection for export.



Preview: Displays the contour lines over the image.

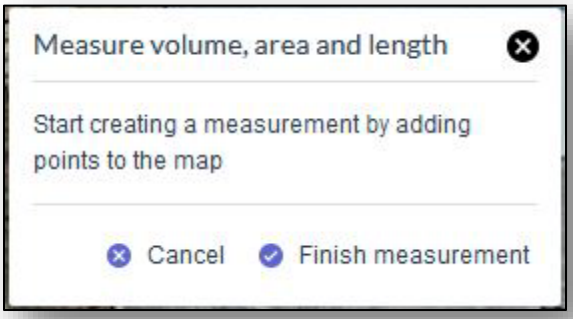


Export: Downloads the contour map file in the chosen format.



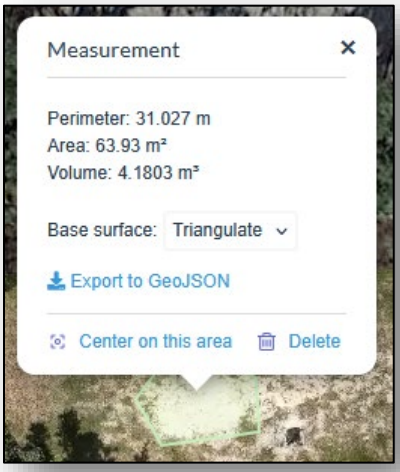
Measure

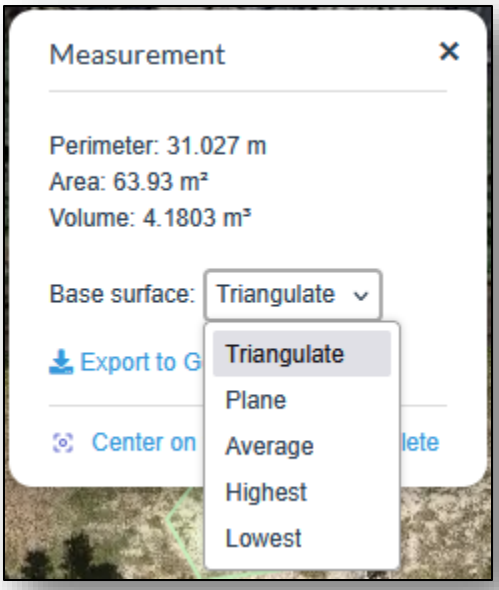
Create a new measurement: Click to begin a new measurement.



Click on the map to create line segments for the measurement. Then click Finish measurement.

The measurements are calculated and displayed.





Change the Base surface to recalculate the volume based on the available levels.

PLEASE NOTE: This is a quick/rough volume measurement. Our volumetrics deliverables are custom (based on your requirements) with finer precision and accuracy.

Export Measurements: Click to download a .geojson file of the measurements.

Fullscreen

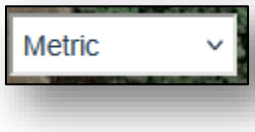
View Fullscreen: Click to display in fullscreen mode. *Note: The Viewer is already fullscreen.*

Zoom

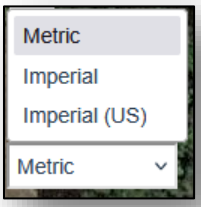
Zoom in: Click + to zoom (scale) in on the map.

Zoom out: Click − to zoom (scale) out on the map.

Unit

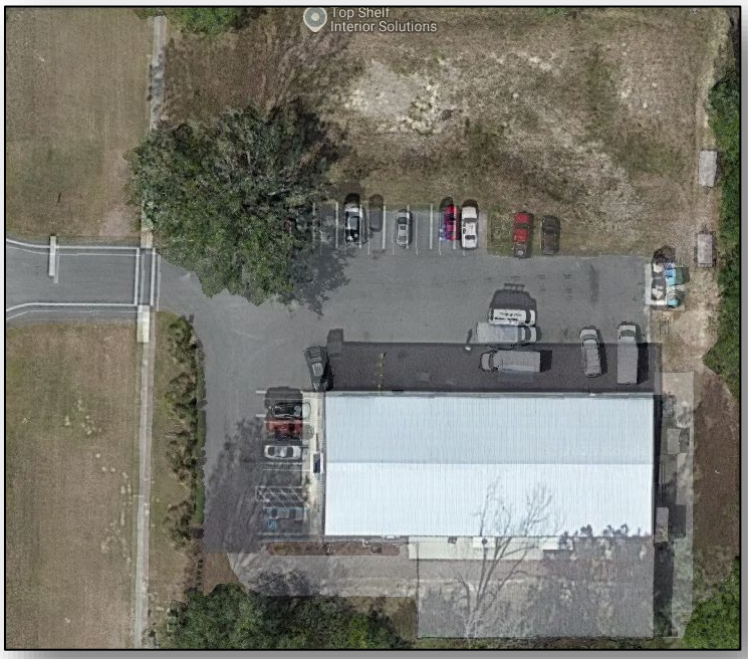


Choose measurement units: Metric, Imperial or Imperial (US).



Opacity

Slide to adjust the opacity of the image.



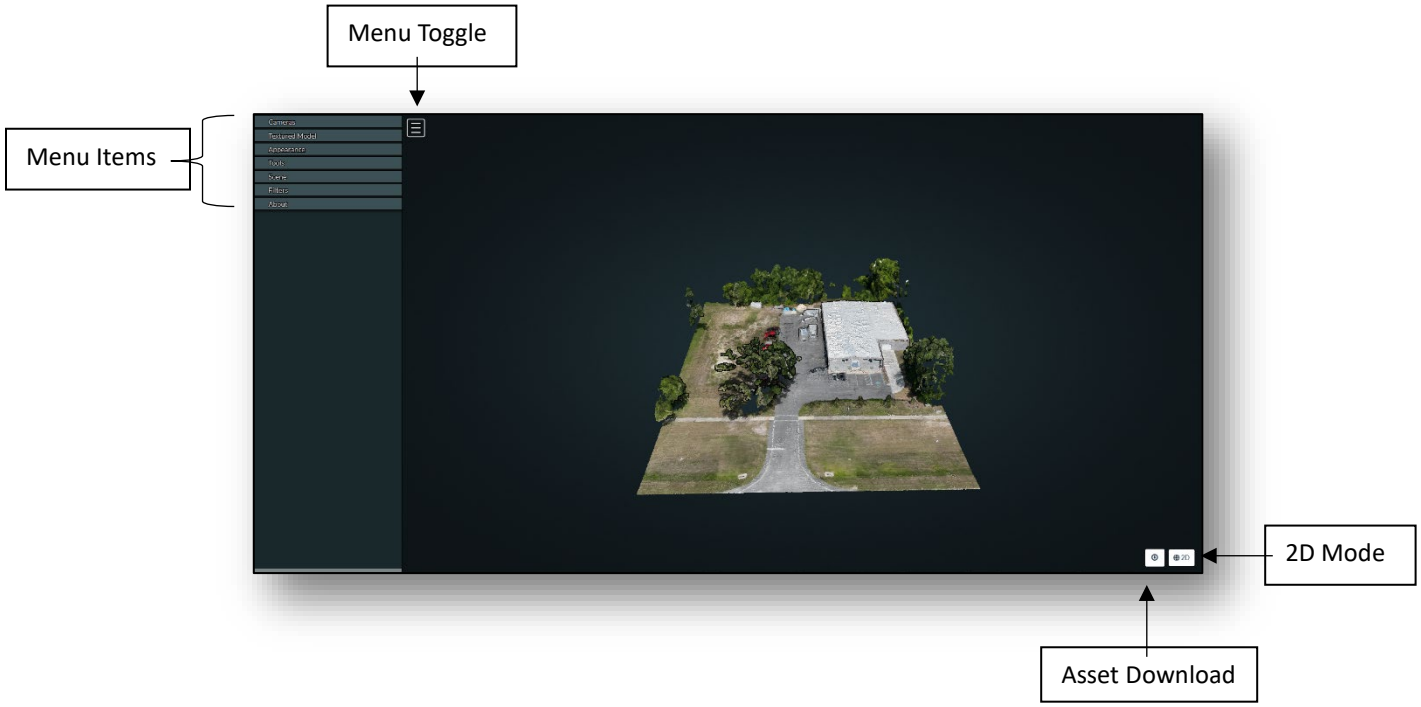
3D Mode

Click to switch to the 3D Model view.

3D Model Viewer

The 3D Model (Potree) Viewer is used to interact with the rendered point cloud.

Overview



Menu Toggle

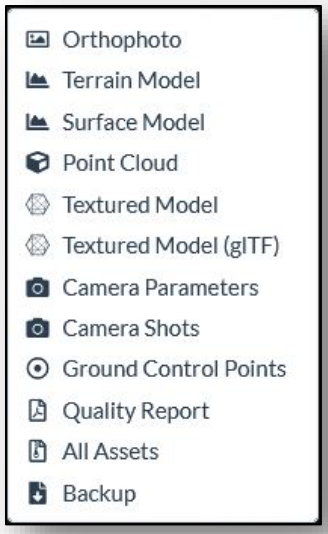
Click to toggle the menu open or closed.

2D Mode

2D Mode: Click to switch to the 2D Map view.

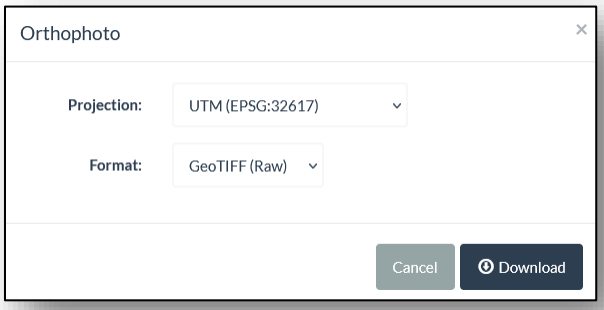
Asset Download

Asset Download: Click to download available assets. Assets vary depending on the client's requested deliverables.



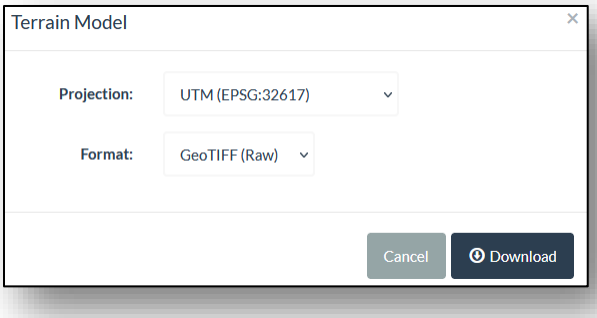
Orthophoto: Download the orthophoto with Projection and Format options.

- **Projection**: Allows one to change the coordinate system used for export between Universal Transverse Mercator, Latitude / Longitude, Web Mercator or to enter a different system.
- **Format**: Allows one to choose between GeoTIFF (Raw or RGB), JPG, PNG or KMZ.



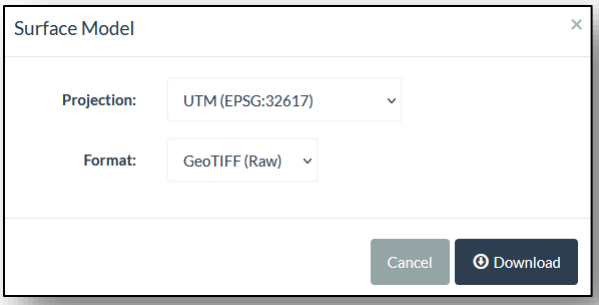
Terrain Model: Download the Digital Terrain Model (DTM) with Projection and Format options.

- **Projection**: Allows one to change the coordinate system used for export between Universal Transverse Mercator, Latitude / Longitude, Web Mercator or to enter a different system.
- **Format**: Allows one to choose between GeoTIFF (Raw or RGB), JPG, PNG or KMZ.



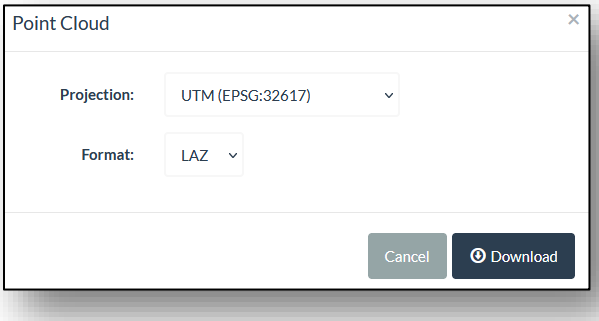
Surface Model: Download the Digital Surface Model (DSM) with Projection and Format options.

- **Projection**: Allows one to change the coordinate system used for export between Universal Transverse Mercator, Latitude / Longitude, Web Mercator or to enter a different system.
- **Format**: Allows one to choose between GeoTIFF (Raw or RGB), JPG, PNG or KMZ.



Point Cloud: Download the Point Cloud with Projection and Format options.

- **Projection**: Allows one to change the coordinate system used for export between Universal Transverse Mercator, Latitude / Longitude, Web Mercator or to enter a different system.
- **Format**: Allows one to choose between LAZ, LAS, PLY or CSV.



Textured Model: Download the Textured Model in a compressed zip file. The zip file contains the main .obj file along with its supporting files (.png images and .mtl materials).

Textured Model (glTF): Download the Textured Model in a .glb file.

Camera Parameters: Download the camera parameters in .json format.

Camera Shots: Download a .geojson file containing details regarding the images used.

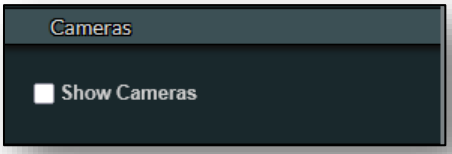
Ground Control Points: Download a .geojson file containing details regarding the GCPs used.

Quality Report: Download a .pdf file containing details regarding the processing, output and errors.

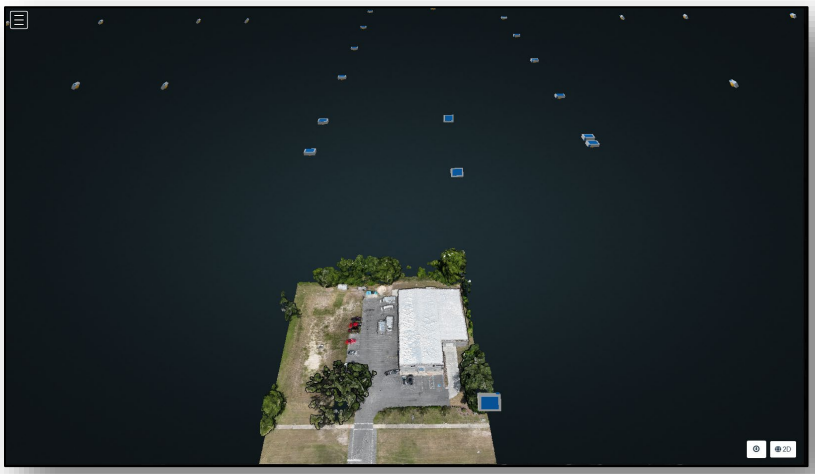
All Assets: Download a .zip file containing all of the assets.

Menu

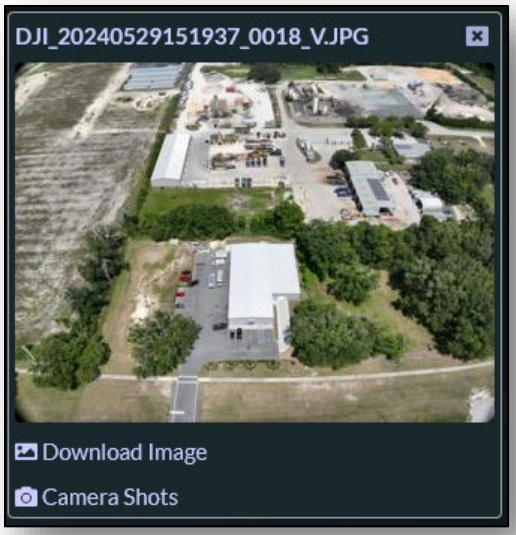
Cameras



Show Cameras: Check to display location icons of where the images were taken.



Clicking on an icon will display its image along with links to download the image and the .geojson file containing details for the images.



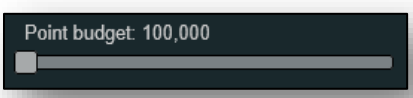
Textured Model

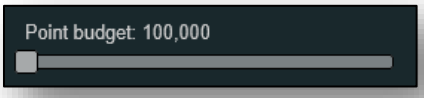
Show Model: Check to “wrap” the point cloud with the derived texture images.

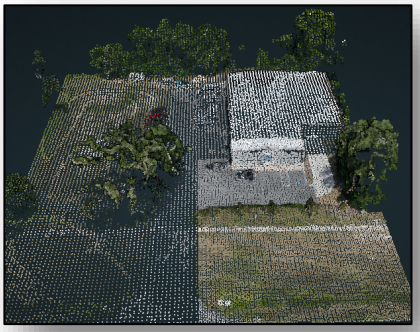
Appearance


Appearance
Point budget: 10,000,000
Field of view: 60
Eye-Dome-Lighting
Enable
Radius: 1.4
Strength: 0.4
Opacity:
Background
Skybox
Gradient
Black
White
None
Other
Splat Quality
Standard
High Quality
Min node size: 30
Box
Lock view

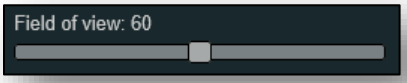
Point budget: Decreasing this value improves viewing performance but decreases point cloud quality.



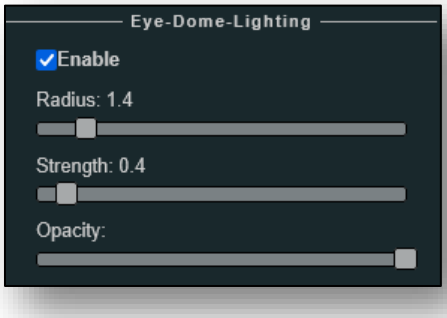




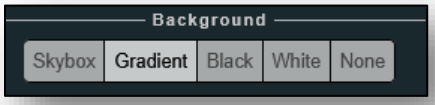
Field of view: Adjusts the extent of the scene that is in view. Reducing the value “zooms” in while increasing it “zooms” out.



Eye-Dome-Lighting: Enabled dome lighting enhances the shadows and depth of field visuals. Adjusting the radius, strength and opacity can be used to change the quality of the image.



Background: Allows one to change the image behind the model.



Other

Splat Quality: Splat quality can be adjusted to standard or high quality, to improve the appearance of the model.

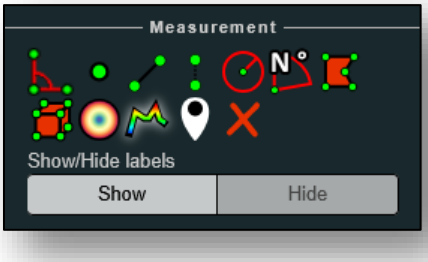
Min node size: Adjusts the size of the blocks that make up the points of the point cloud. Smaller values improve the appearance.

Box: Displays a cube structure that illustrates how the point cloud is organized.

Lock view: Checking this freezes the node size and provides a consistent level of clarity when “zooming” in and out of the point cloud.

Tools

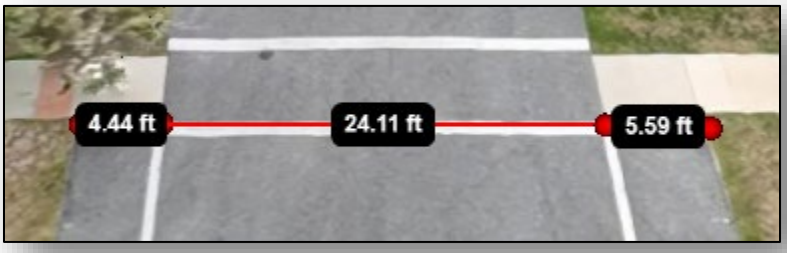
Measurement



The **Angle** tool measures the angle formed by the lines created between three points. Click in three locations to set the points.

The **Point** tool presents the X, Y and Z coordinates of a location. Click on a location to display the coordinates.

The **Distance** tool presents the straight-line length between two points. Click in two locations to display the length. One may click in more locations to continue measuring. Right-click to stop measuring.



The **Height** tool presents the vertical distance between two points. Click in two locations to display the height.

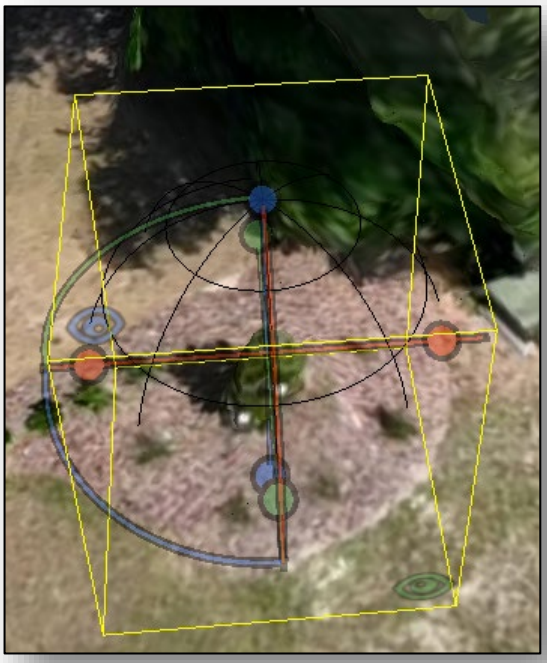
The **Circle** tool presents the radius of a circle based on three points. Click in two locations and then set the third location with another click. The points may be adjusted as needed.

The **Azimuth** tool presents the angle of a line created by placing two points, from geographical north. The angle is in degrees from 0 to 359.99 in a clockwise direction. North is indicated by: 

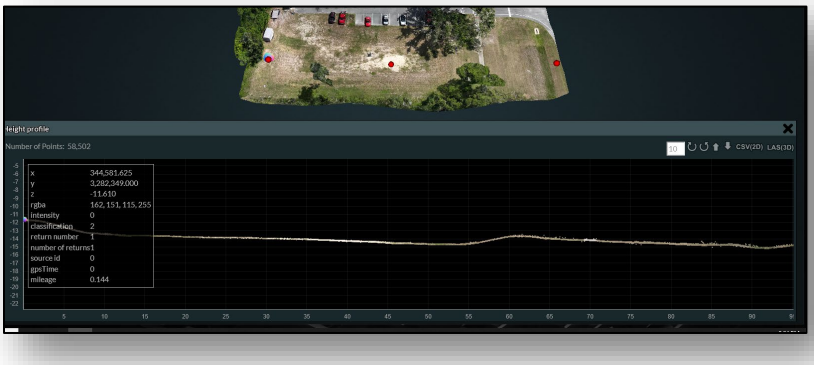
The **Area** tool presents the horizontal area of a polygon along with the length of each of its sides. Click in the locations of the vertices and right-click to finish the polygon.

The **Volume** (cube) tool presents the volume a cube. Click and drag the handles to resize and rotate the cube.

The **Volume** (sphere) tool presents the volume a sphere. Click and drag the handles to resize and rotate the sphere.



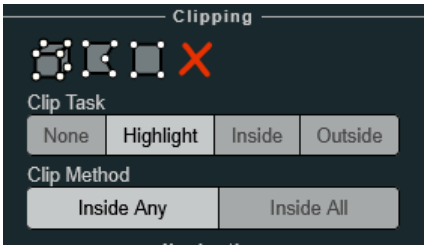
The **Height Profile** tool presents a “side view” height diagram. Click in at least two locations along the path to be profiled. Right-click when finished. The profile can be displayed by clicking the show 2d profile under Scene (please see below).



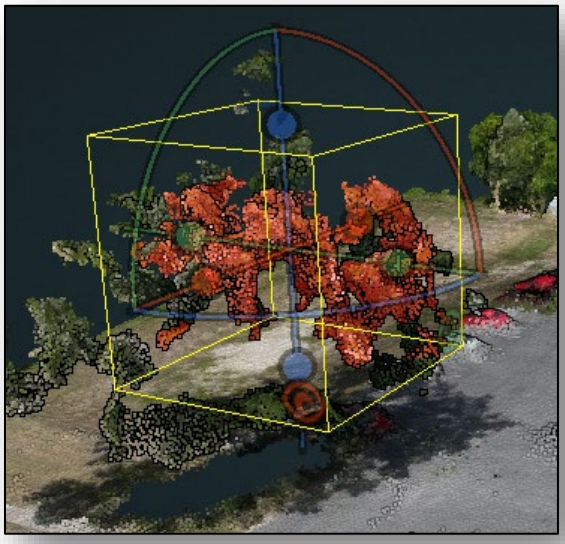
The **Annotation** tool allows one to markup the model.

The **Remove Measurements** tool deletes all measurement and annotations.

Clipping

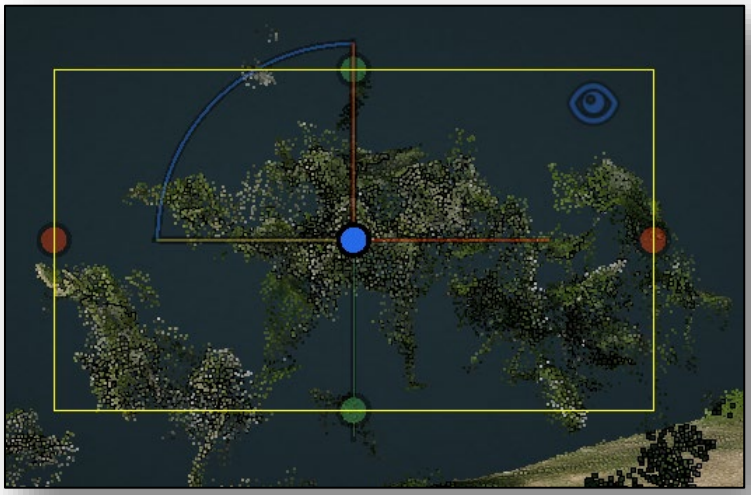


The **Volume** clip tool allows one to select a 3D space of the point cloud to be clipped with a cube outline. Click on a location in the point and then re-size and rotate the cube as needed.

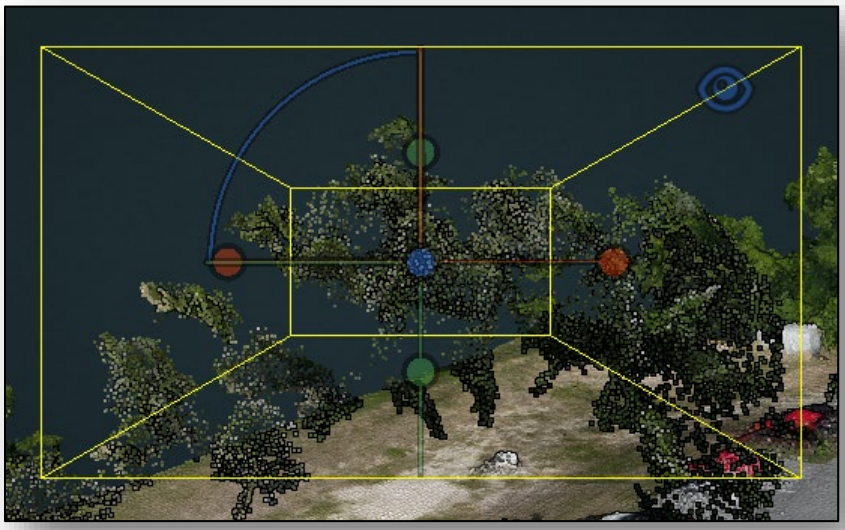


The **Polygon** clip tool allows one to select an area of the point cloud to be clipped. Click on vertices of the polygon to be clipped. Right-click when finished.

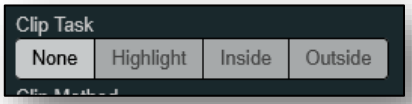
The **Select Box** clip tool allows one to select a box area of the point cloud to be clipped. This is from an orthogonal perspective and one must be in the **Orthographic Camera Projection** to use (see below). Click and drag around the area to be clipped.



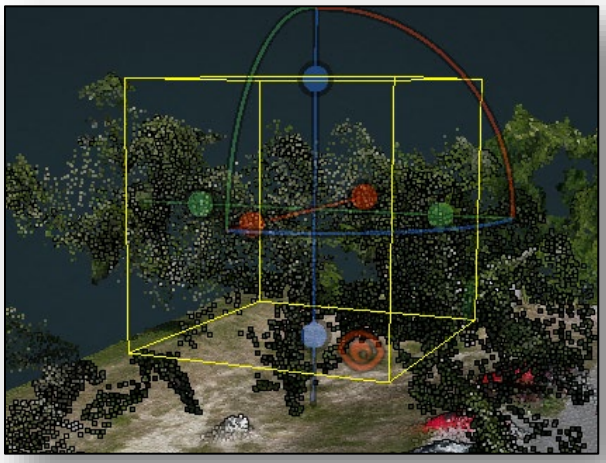
Changing to the **Perspective Camera Projection** allows one to modify the box.

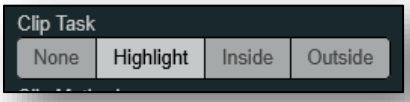


The **Remove Measurements** tool deletes the clipping areas.

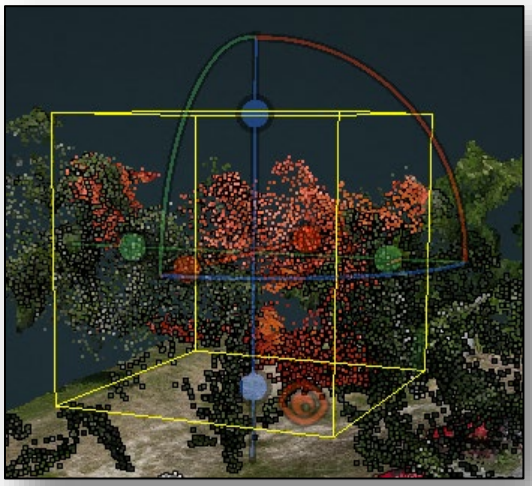


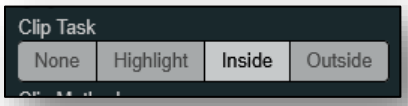
None doesn’t do any clipping.



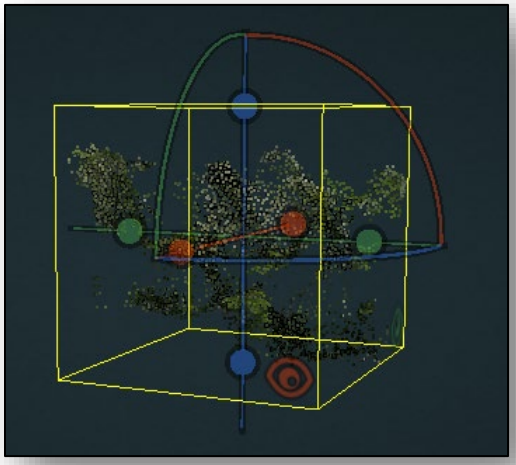


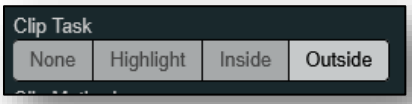
Highlight displays the selected points in red.



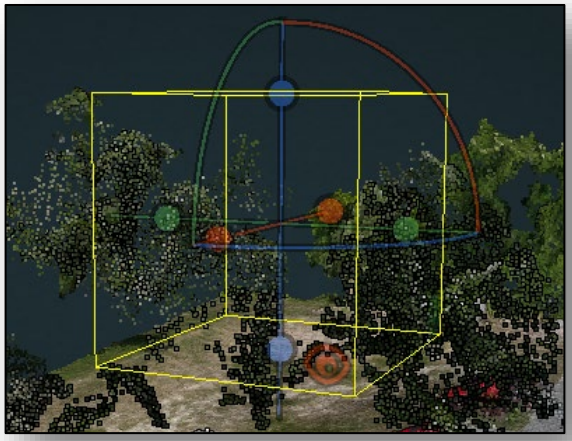


Inside hides the non-selected points.

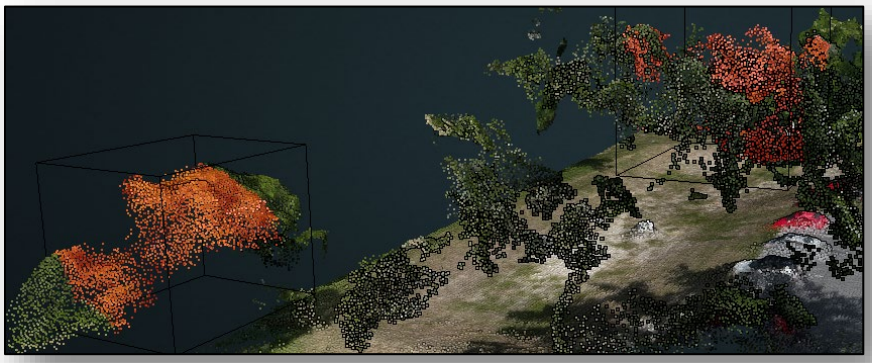




Outside hides the selected points.

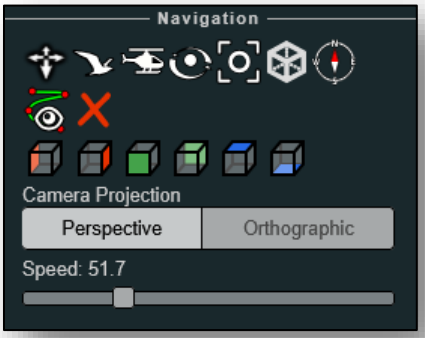


Inside Any performs the above task on multiple selected areas.



Inside All hides or displays all of the points.

Navigation



The **Earth control** navigation uses the left mouse button to move the model, the right mouse button to rotate the model and the mouse wheel to zoom in and out.

The **Fly control** navigation uses the keyboard keys “W” and “S” to move an aerial “bird’s eye” view forward and backward. Keys “A” and “D” move the view left and right. Keys “R” and “F” move the view up and down. The left mouse button rotates the view and the right mouse button moves the view axis.

The **Helicopter control** navigation uses the keyboard keys “W” and “S” to move an aerial “aircraft” view forward and backward. Keys “A” and “D” move the view left and right. Keys “R” and “F” move the view up and down. The left mouse button rotates the view and the right mouse button moves the view axis.

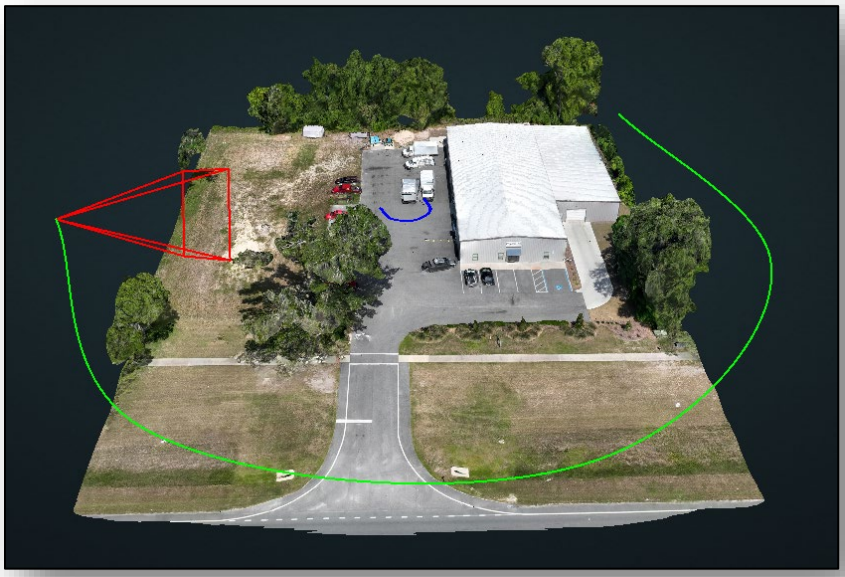
The **Orbit control** navigation uses the left mouse button to orbit the model, the right mouse button to move the model in XYZ and the mouse wheel to zoom in and out.

The **Full extent** control restores the default extent of the model.

The **Navigation cube** displays a wireframe cube.

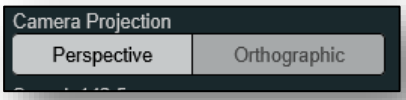
The **Compass** displays a compass in the upper right corner of the window.

The **Camera Animation** tool allows one to create a path for a “camera” to fly to create an animation. The animation may be adjusted and played in the **Scene** section (please see below).

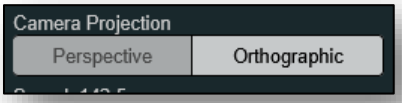


The **Remove last camera animation** tool deletes the last camera animation that was added to the model.

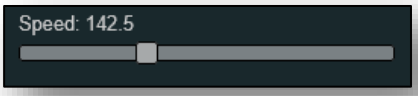
The **View** buttons display the left, right, front, back, top and bottom sides of the model respectively.



The **Perspective Camera Projection** displays the model in a perspective view.

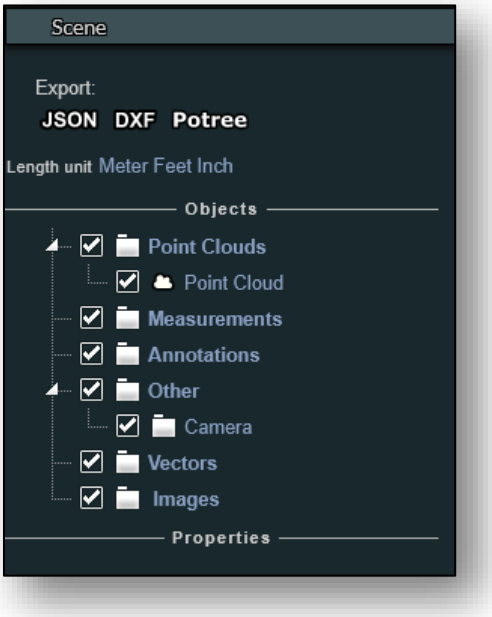


The **Orthographic Camera Projection** displays the model in an orthographic view.

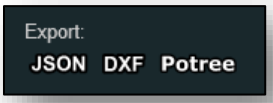


The **Speed** control adjust how quickly mouse movement and wheel scrolling changes the view.

Scene



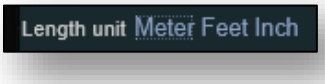
Export



JSON exports any measurements created to a .json file.

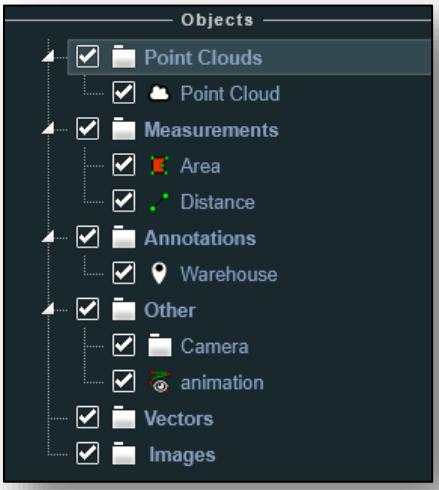
DXF exports any measurements to a Drawing Exchange Format .dxf file.

Potree exports data about the model in .json format.

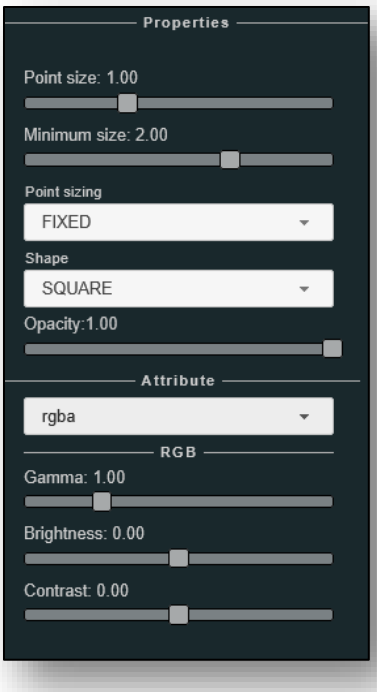


Length unit allows one to select Meter, Feet or Inch for measurements.

Objects

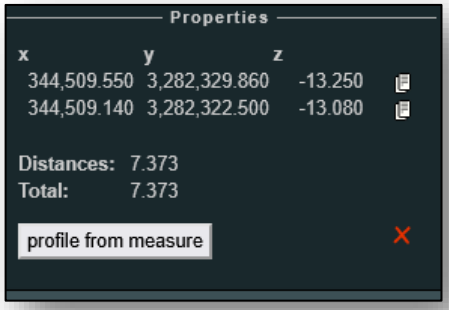


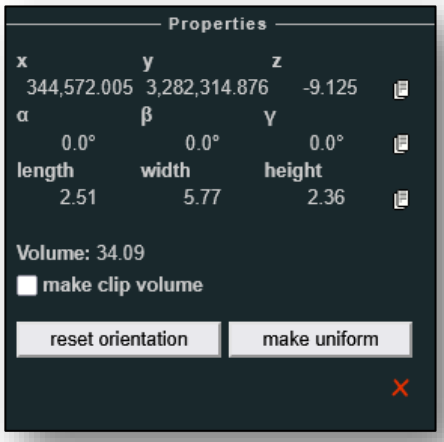
The **Objects** pane will display all of the model's objects. Un-checking a box will hide that object from the model. Selecting an object displays its properties in the panel below. The **Properties** panel is used to manipulate that object. For example, the **Point Cloud** has the following properties:

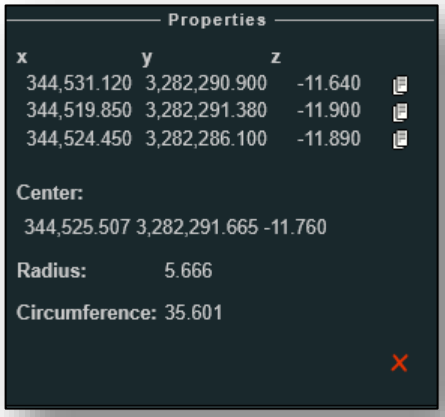


Changing an **Attribute**, allows one to change that attribute's configuration:

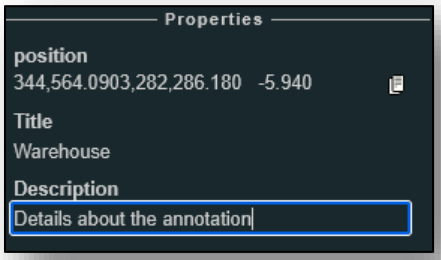
Measurement properties list information specific to the measurement selected. There is also a button to delete the measurement.



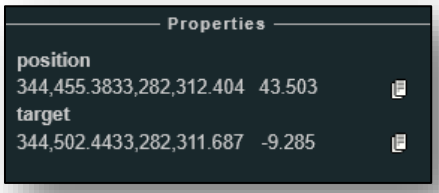




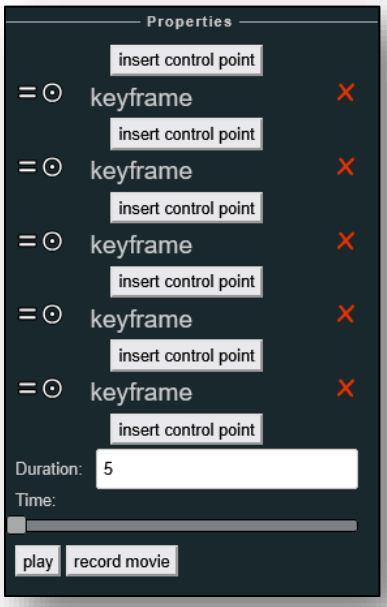
Annotion preoperties permit one to modify its **Title** and **Description**.



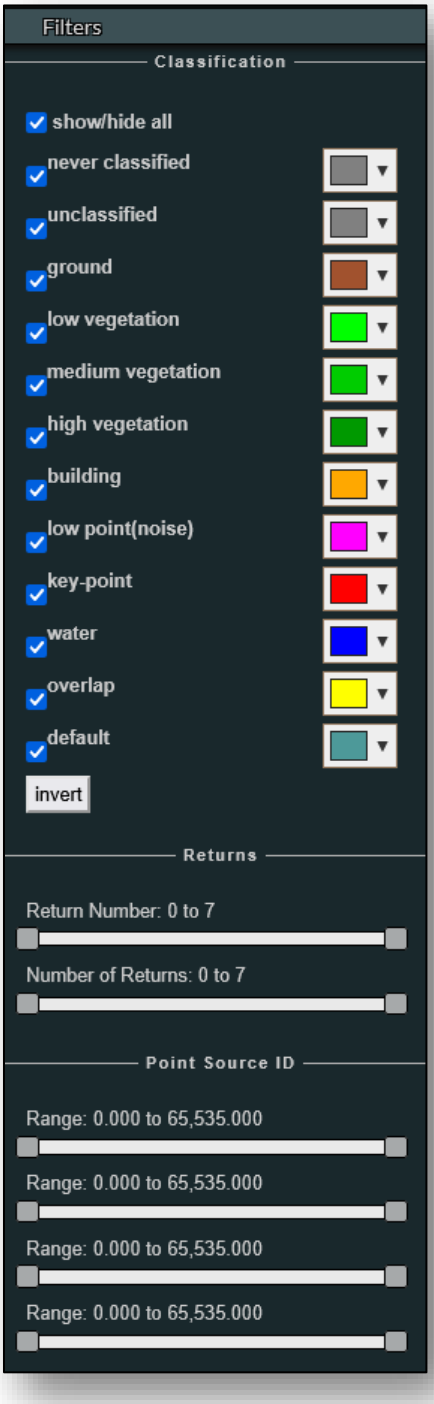
Camera properties displays the current location of the view.



Animation properties allows one to insert or edit keyframes, set the duration, play the animation and record a video of the animation (in .webm format).

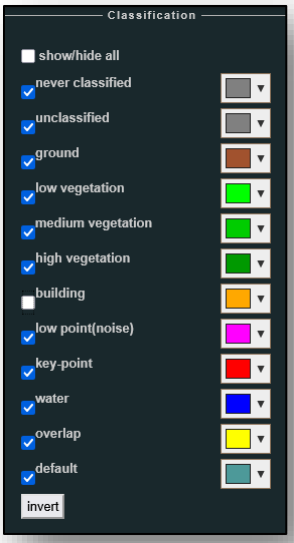


Filters

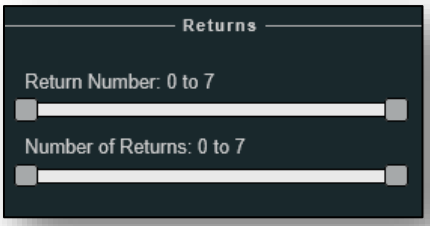

Filters
Classification
show/hide all
never classified
unclassified
ground
low vegetation
medium vegetation
high vegetation
building
low point(noise)
key-point
water
overlap
default
invert
Returns
Return Number: 0 to 7
Number of Returns: 0 to 7
Point Source ID
Range: 0.000 to 65,535.000
Range: 0.000 to 65,535.000
Range: 0.000 to 65,535.000
Range: 0.000 to 65,535.000

Classification

Classification allows one to show or hide parts of the point cloud based on what the object has been deemed. For example, unchecking building:

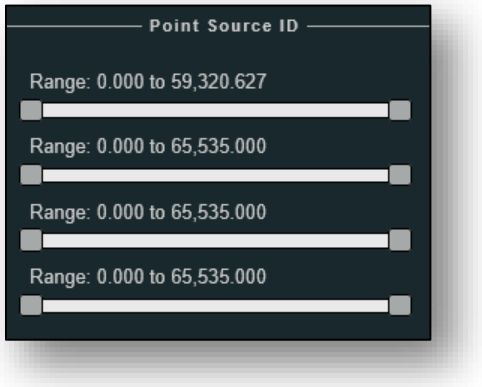


Returns



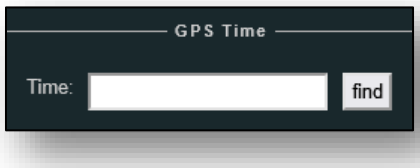
Not applicable.

Point Source ID



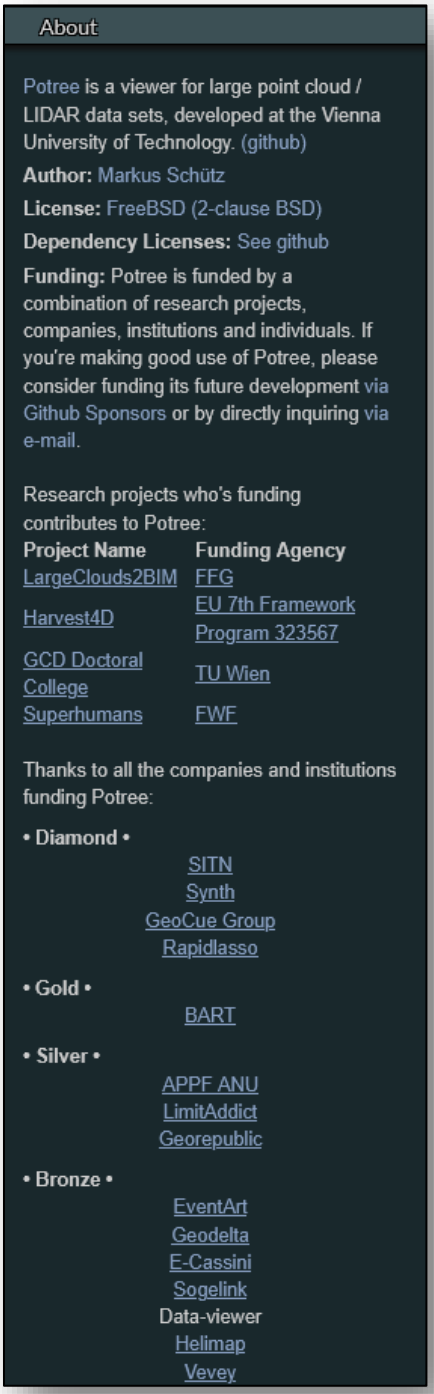
Not applicable.

GPS Time



Not applicable.

About



About displays information regarding the Potree point-cloud viewer.