Working with 2D Data

Top-down static imagery plays a significant role in today's remote sensing data across the globe. This imagery is used to generate orthorectified rasters, elevation maps, and other two-dimensional models. SkyDeck provides powerful tools to leverage this 2D data to its fullest potential. With SkyDeck, you can generate detailed visualizations from survey imagery, conduct in-depth analysis, and apply mathematical and AI-powered models to derive valuable insights from the data.

This page will explore the various features available on SkyDeck that empower you to unlock the full potential of your 2D data.

- **Types of 2D Data on SkyDeck**: Explore the different types of 2D data supported on SkyDeck, including aerial imagery, orthophotos, and digital elevation maps and more.
- **Uploading 2D Models**: Learn how to upload and manage 2D models within SkyDeck.
- **Visualizing 2D Data**: Discover how SkyDeck enables detailed data exploration and analysis of your survey data with its visualization tools.

Types of 2D Data on SkyDeck

Orthophoto

An orthophoto, also known as an orthomosaic, is a detailed, georeferenced aerial photograph corrected for geometric distortions that typically occur in standard aerial imagery. A good orthophoto accurately represents the Earth's surface, with uniform scale across the entire image and accurate georeferencing, making it a reliable tool for mapping and planning tasks. Orthophotos generated using drones imagery provide clear, high-resolution imagery useful for a wide range of applications, from surveying and construction to agriculture and inspections.

Surface Model

A surface model, also known as a digital surface model (DSM), is an elevation model that represents both natural terrain features and man-made structures. DSMs are valuable for visualizing complex urban landscapes as these models provide valuable insights into elevation variations across landscapes, aiding in urban planning, infrastructure development, and environmental monitoring. Elevation models like DSMs are essential tools for analyzing and understanding terrain characteristics and built-up areas in several geographic information systems (GIS) applications

Terrain Model

A terrain model, or a digital terrain model (DTM), is an elevation model that represents the natural terrain surface without including any man-made structures. DTMs focus solely on depicting the topographic features of the Earth's surface, such as mountains, valleys, rivers, and other natural landforms. They are extensively used in geographic information systems (GIS) and related applications for terrain analysis, landform classification, watershed and flood modeling, and slope analysis.

Slope Map

A slope map visually represents the steepness of terrain surfaces across a geographic area. It quantifies the rate of elevation change between points on the landscape, providing valuable information for terrain analysis and planning. Using the elevation models, SkyDeck can generate slope map for a terrain using mathematical algorithms to calculate slope angles at each point. Slope maps are essential for land suitability assessment, hydrological modeling, and natural hazard analysis, offering insights into terrain characteristics for informed decision-making in land management and engineering projects.

Information Models (Single band rasters)

SkyDeck supports the visualization and processing of single-band raster data, enabling you to upload and process data according to your specific needs. This may also include data models generated from multispectral images such as NDVI (Normalized Difference Vegetation Index) and NDRE (Normalized Difference Red Edge). This allows you to leverag specialized datasets for vegetation analysis, crop monitoring, and environmental assessment providing valuable insights into agricultural productivity and decision-making in precision farming, land management, and environmental monitoring applications.

Uploading 2D Models

SkyDeck provides the capability to upload and manage various supported 2D data models, including raw imagery from surveys. Once uploaded, these files are organized within the datasets page of the snapshot, offering convenient and efficient management options.

> **Click here** to learn how to create these 2D data models directly on SkyDeck using our photogrammetry feature.

Steps for uploading any 2D model

1. Navigate to the Snapshot where you want to upload your data.

2. Click on the **Datasets** button on the top right to navigate to datasets of the concerned Snapshot

3. On the Datasets page, open the **2D Layer** tab and click on the **ADD** icon next to the **Select 2D Layer** option.
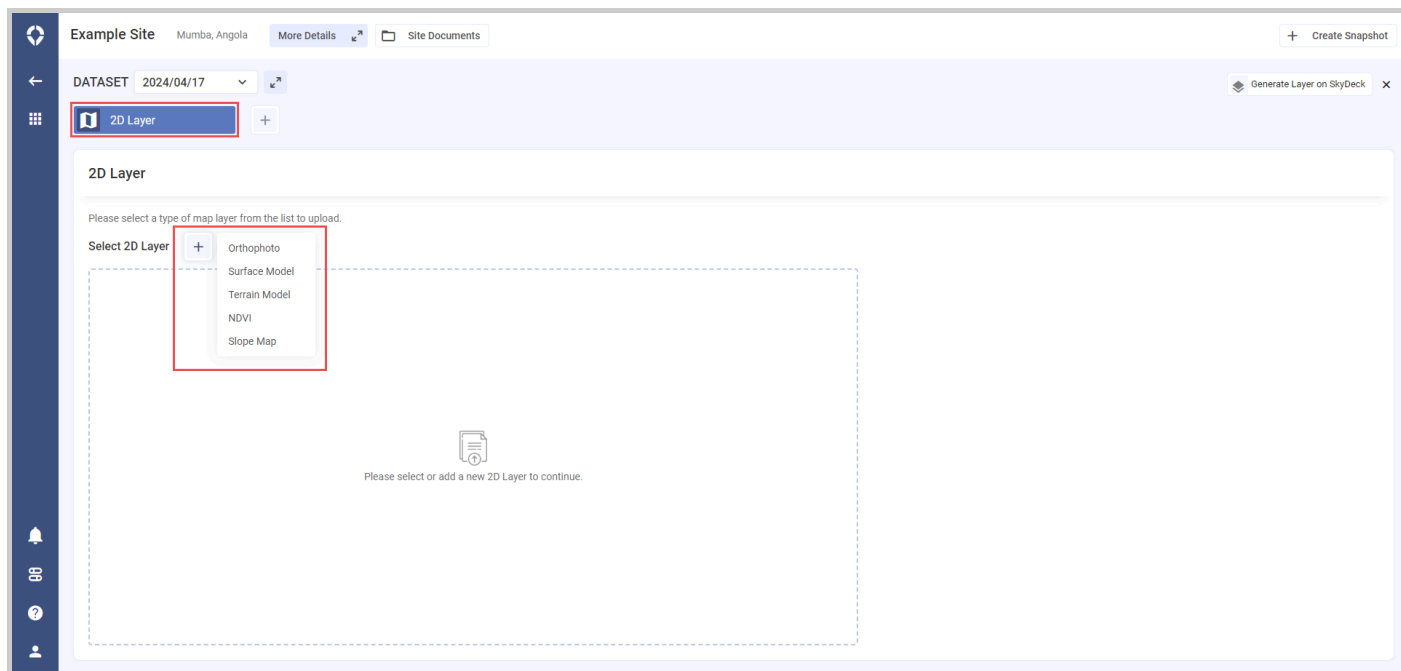

Upload 2D model

4. Select the 2D data type that you want to upload from the list. A new tab for the data type will be added to the datasets page.

5. **Drag and drop** the raster file OR click **Browse** option to attach the file from your system. This will start the upload process.

> **Supported formats:** .TIFF, .TIF
>
> Note that the **Coordinate Reference System** used in the attached raster should be **WGS 84 EPSG:4326** for proper visualization
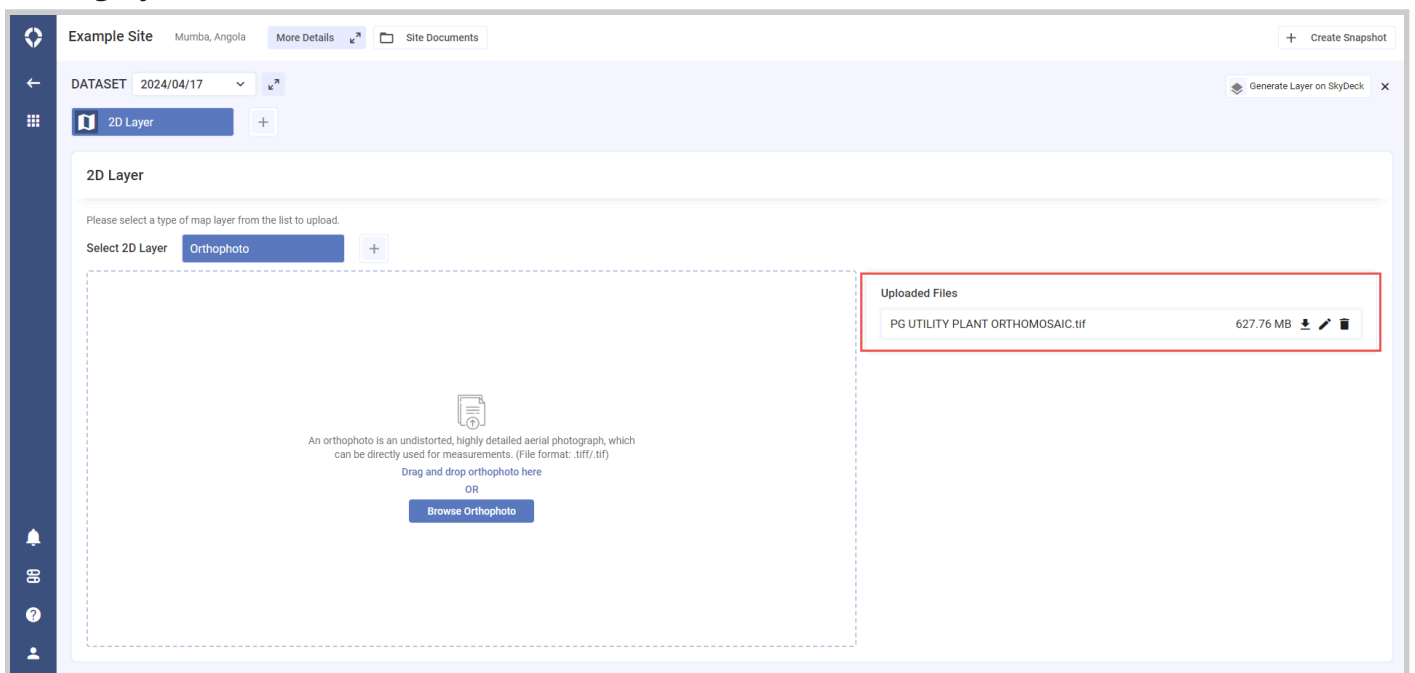
6. You can track the upload progress for the attached file on the right pane.

> Do not leave or close the webpage until the file upload is complete.
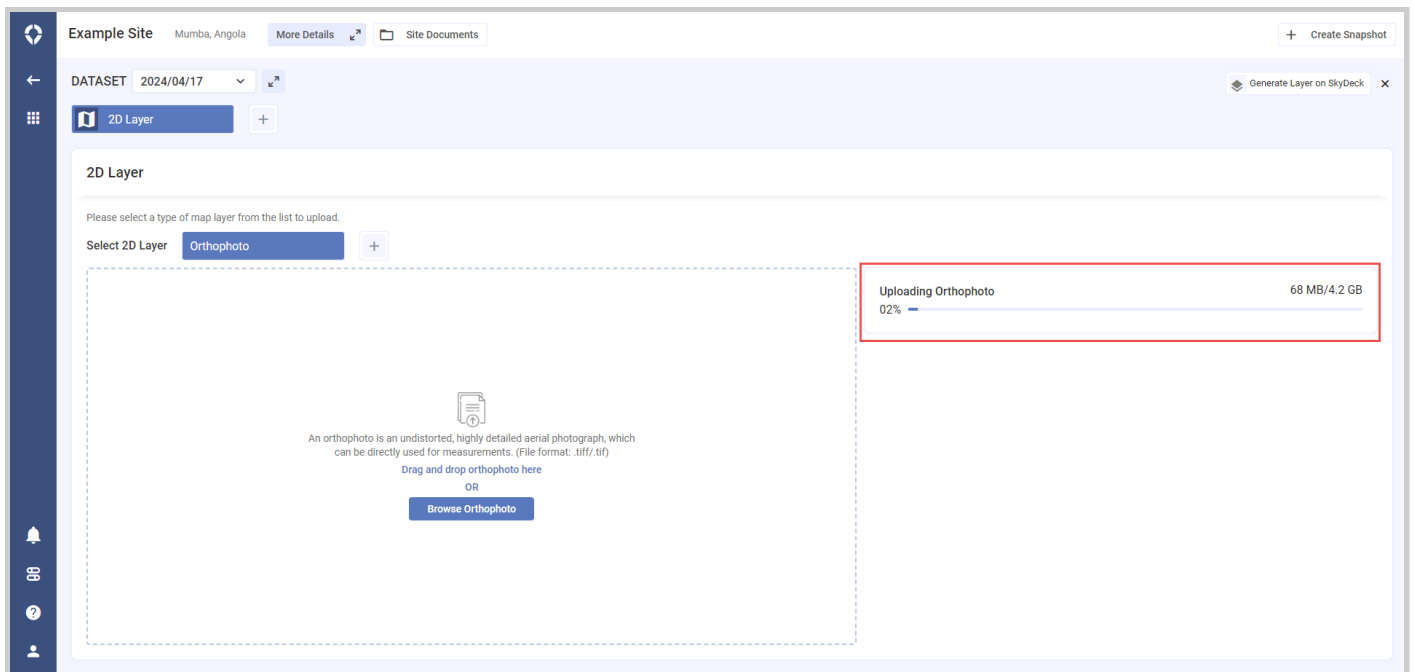
Tracking file upload

7. Once the upload is completed the file will be visible under the Uploaded files section. You can you the **Download**, **Rename** and **Delete** options available in this section to manage your files.
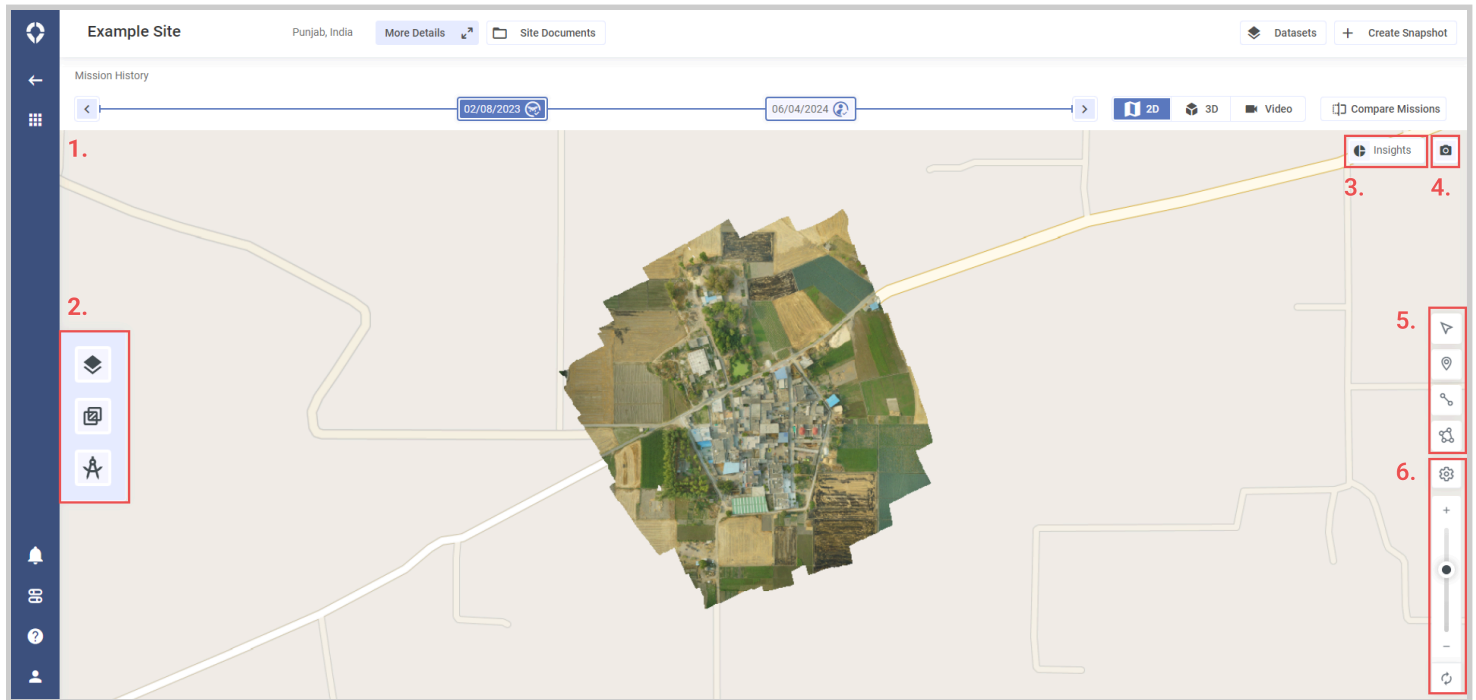

Uploaded files

Visualizing 2D data

You can view your 2D data models by navigating to the Snapshot and selecting the 2D mode option on from top right.

> All data visualized on SkyDeck undergoes a tiling process and optimization for web browser viewing, ensuring efficient performance even when accessing SkyDeck over

Layout of 2D data mode

2D data visualization

Key Components of 2D Visualization Mode:

1. **Map area:** This displays any created or uploaded 2D dataset overlaid on the base map, providing a visual representation of the data within its geographic context.

2. **Management sidebar**: Allows you to manage and customize the visualized data. This includes managing 2D layers, vector overlays, and annotations.

3. **Insights menu:** Contains options to run various analytical features and generate insights on the visualized data for deeper analysis.

   Click here to learn more about the Insights menu.

4. **Raw Image Viewer**: Enables viewing of raw images georeferenced within map layers, providing enhanced geographic context to the image data.

   **Click here** to learn more about the the Raw Image Viewer.

5. **Annotation tools**: Allows you to create annotations on the visualized 2D data

   Click here to learn more about the Annotation tools.

6. **Map controls:** Enable switching between map and satellite views and adjust zoom level for the map.
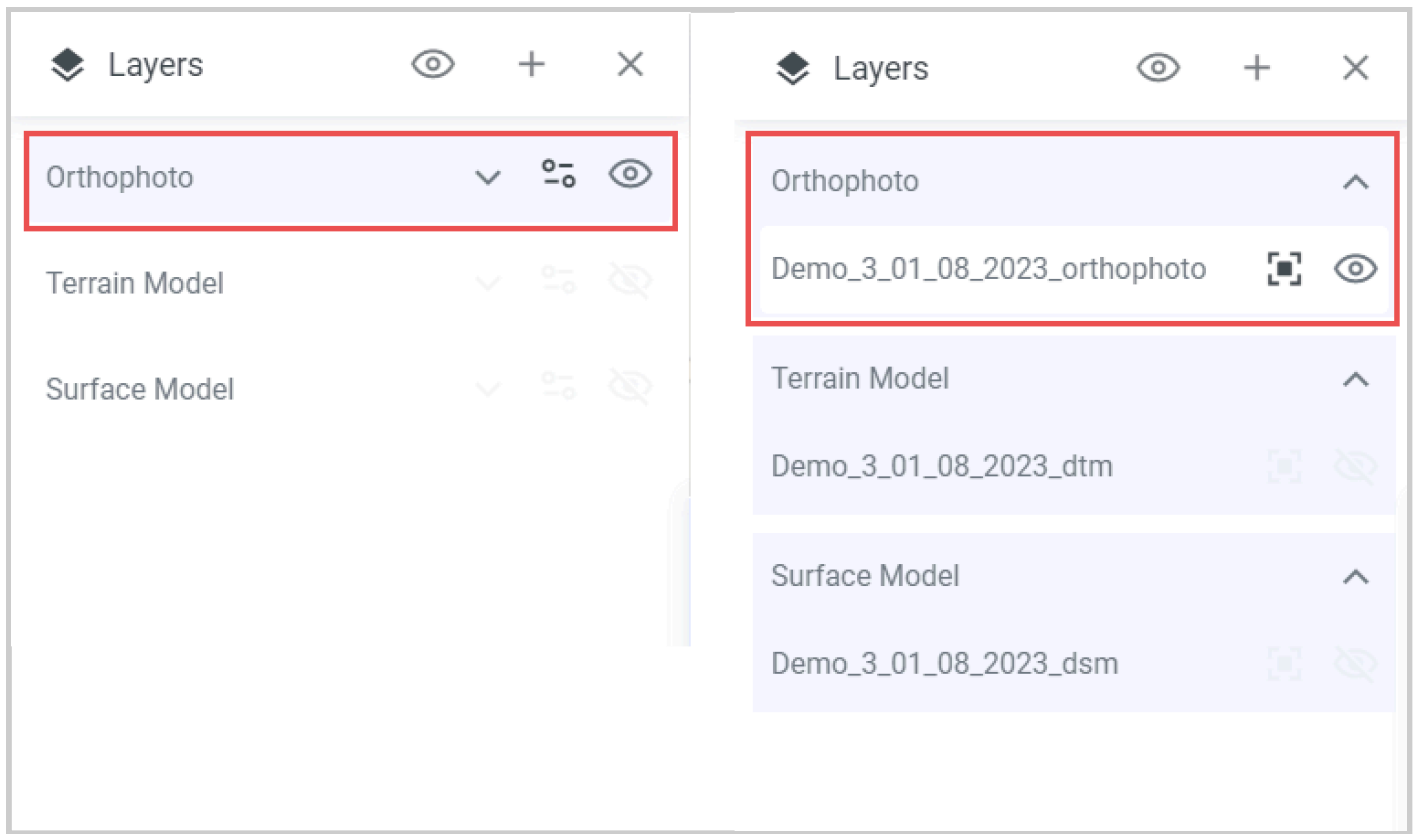
Managing 2D layers

The **Layers** panel from the **management sidebar** can be used to view and manager all available 2D models on a snapshot.
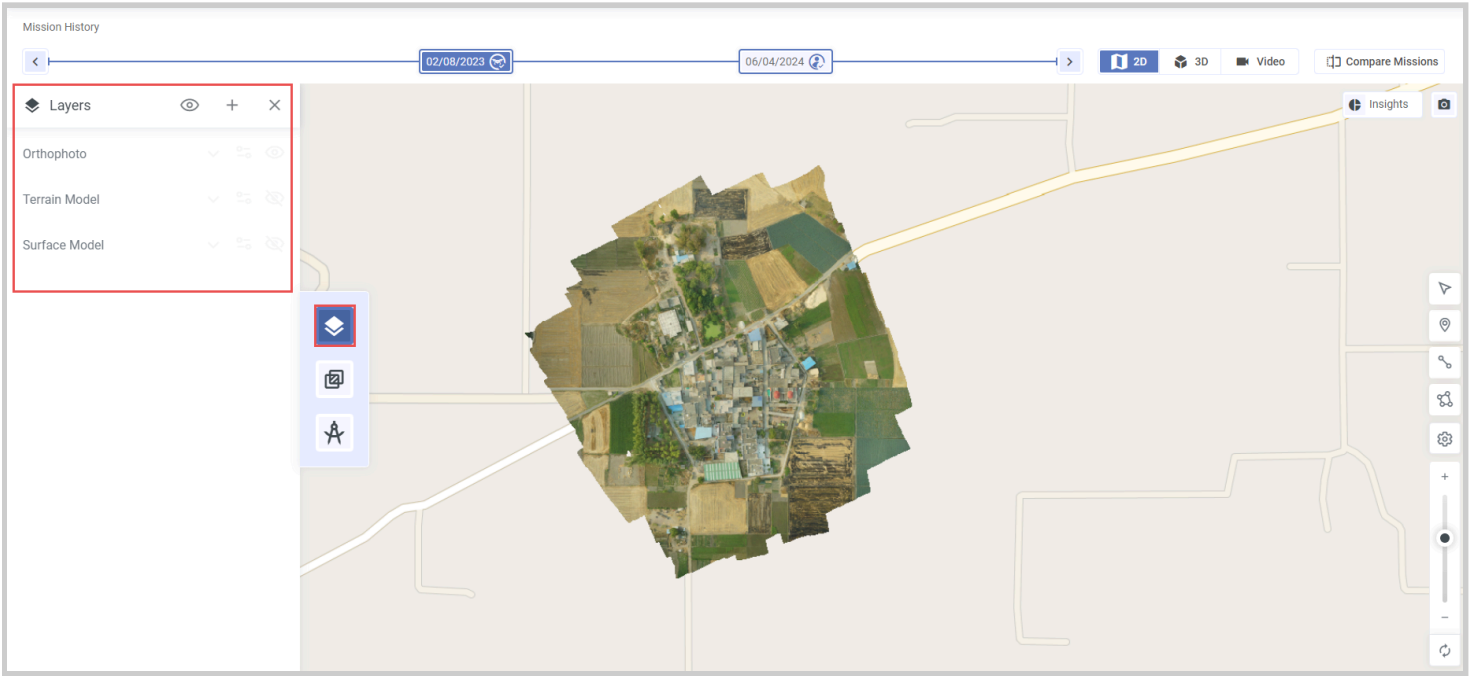
2D data management

Hovering over a data type will reveal available options, while expanding the datatype will display all individual layers associated with that data type
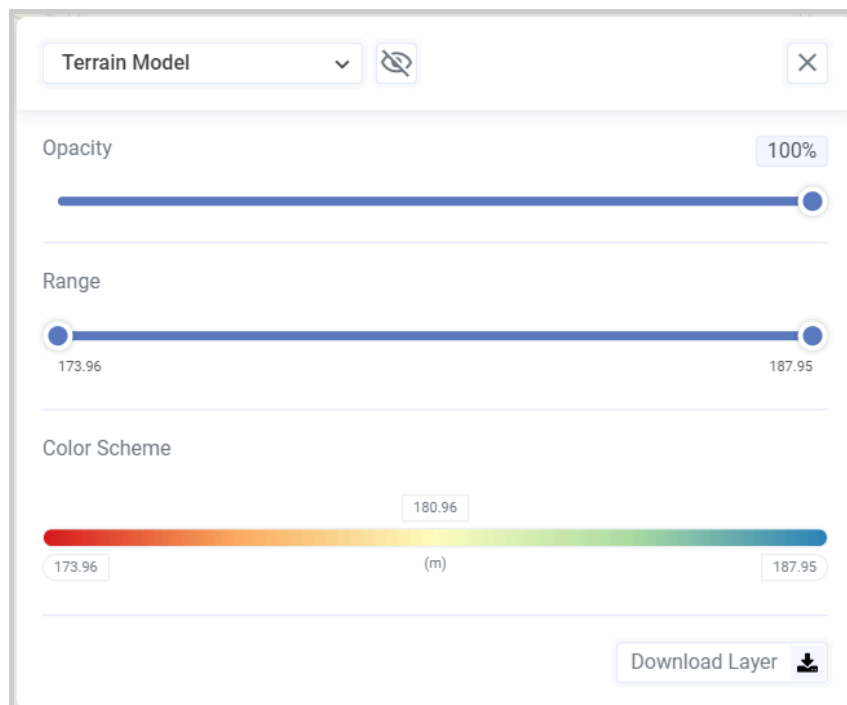
Layer options

The following options are available:

Option	Description
Customize visualization	This option lets you change how the data is visua
Show/Hide All	This option can be used to show or hide a specific layer
Refocus	This option can be used to focus the map on the s

Customizing how data is visualized

Click on the customize option to change how the model is visualized.

Customization options

The following Layer customization options are available:

Option	Description
Select layers	Choose the layer you want to customize from the drop-down menu.
Show/Hide Icon	Toggle the visibility of the selected layer on or off using the show/hide icon.
Opacity	Adjust the opacity of the selected layer by moving the slider left (less opaque) or right (more opaque).
Range	Define the range of information considered for color mapping during visualization.
Color Scheme	Change the color scheme to customize the appearance of data models according to your preferences.
Download layer	Download the selected layer for offline use or further analysis.

The **Range** and **Color Scheme** options are not applicable for **Orthophoto**.