Skyline® it's your world™

TerraExplorer for Desktop

Quick Start Guide

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Opening, Creating, and Saving a Project and Logging In to SkylineGlobe Server

TerraExplorer basic commands are available from the File menu located in the upper-left corner of the application.

Opening an Existing Project

Click > **Open** > **Open Project from File** OR **Open Project from SkylineGlobe >** Browse to an existing .Fly file or connect to a SG server. You can open a US demo project by clicking the link on the **Start** page.

Saving a Project as a FLY File

A .Fly file is a compressed binary file that contains all the project settings and content, and pointers to terrain databases (MPT) or other loaded files. Click and then click **Save or Save As**...

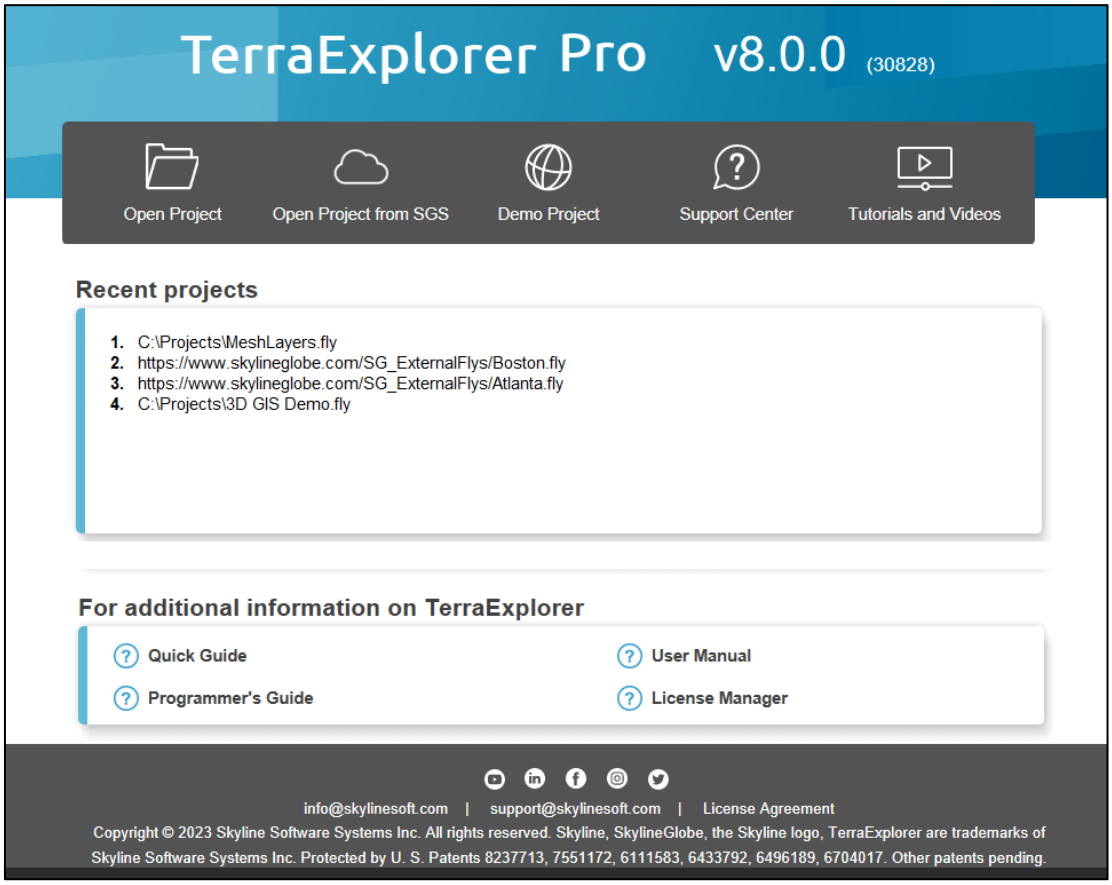
Creating a New Project

Click and then click **New** > In dialog, browse to required terrain database (MPT), and click **OK** > Define project settings.

Logging In to a SkylineGlobe Server

On the top right of the application ribbon, click **Log in >** In **SkylineGlobe Server** dialog box enter login information and click **Log in**.

More about: Basic concepts in TerraExplorer >



Navigating in the 3D Window

Navigate through the 3D World in the way you find most natural and intuitive: navigate freely using on-screen navigation controls or any of the three mouse modes, or fly to predefined locations or objects.

Viewing or Flying to a Location or Object (Using the Project Tree)

1. In the **Project Tree**, double-click the location or object, or right-click and select **Fly to**, **Jump to**, or **View**. If you view the object, you can select one of the pre-defined flight patterns that compass about the object.
2. To stop a flight to a location right-click in **3D Window**, and select **Stop** or press the **Spacebar**.

Free Flight

Using the mouse to navigate:

In Drag mode, do the following:

Note: This is the default mode. Other navigation modes can be set in the Options dialog.

- To **pan** - Click and drag the mouse to the sides, forward, or backward.
- To **zoom** in and out - Roll the middle mouse wheel.
- To change **direction and tilt** - Click and drag the middle mouse wheel.

Using HUD navigation controls:



View tab > Select **Graphic HUD** to display.

 Turn the plane to face North.

 Zoom in.

 Zoom out.

Underground Navigation

1. **Home** tab > **Underground Mode**.
2. Navigate in the 3D environment. You can freely go through the terrain surface in any direction.

Following a Dynamic Object

- In the **Project Tree** > Double-click the required dynamic object.

More about: Navigating in the 3D World >

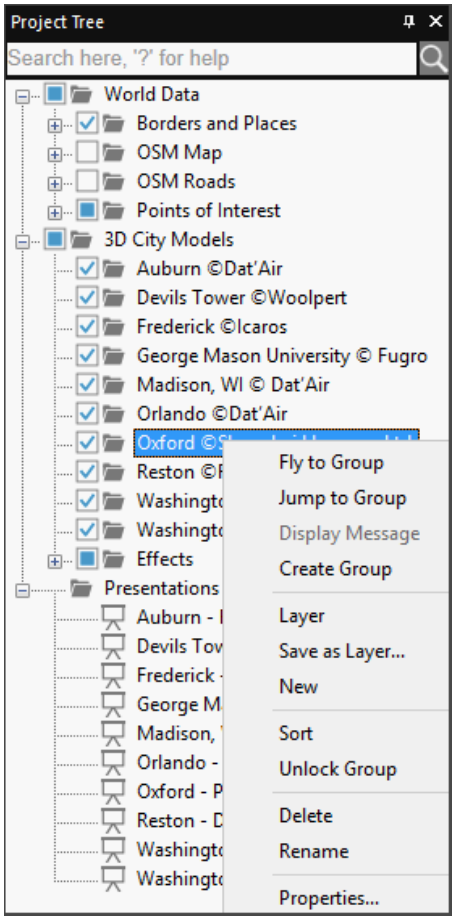
Managing Projects - Using the Project Tree

The Project Tree provides a list of elements in the terrain that can be sorted and arranged into groups. Using this list, you control the appearance of information in the 3D Window. The **Omni search tool** at the top of the Project Tree enables you to search everything (Project Tree, ribbon commands, SkylineGlobe Server and addresses server) in one-click for the commands, layers, objects and locations you need.

Searching the Project Tree, Ribbon Commands, Address Server, and SkylineGlobe Server

In the **Project Tree**, **Search here** field, type a search term. When clicking on a search result, the operation TE performs depends on the result type selected:

- **Commands:** - Activates the command.
- **Project:** - Selects the item on the project tree and flies to its location.
- **Addresses:** - Flies to the address location.
- **SkylineGlobe:** - Loads the layer.
- **[Feature Layer]:** - Flies to the feature location.



Showing and Hiding Objects or Layers in the 3D Window

In **Project Tree**, click the object or layer's **show/ hide** icon ☑ to display or hide it in the 3D Window.

Selecting a Tree Item

In **Project Tree**, click the item. Double-clicking performs the activation action (fly to, jump to, circle/ oval pattern, etc.) set in the item's property sheet.

Creating and Working with Groups

1. Right-click blank area (root) of Project Tree (for subgroup, right-click parent group) > Select **Create Group**.
2. Type the name of the new group and press **ENTER**.
3. To move an item into a new group, click and drag it onto a group folder.
4. To add a new element to a group, right-click group > Point to **New** > Select **Location**, **Presentation** or **Message**.
5. To set group properties, right click <group> > **Properties**. In **property sheet**, set parameters.

Creating Locations in the Current Camera Position

1. In the **Project Tree,** right-click > **New** > **Location**. Type a name for the location and click.
2. Open **property sheet** to set activation action or add a message: In **Project Tree,** right-click location > **Properties**.

More about: Using the Project Tree >

System Requirements

System requirements for installing and using TerraExplorer:

- **Operating System** - Windows® 10 /11 – 64 bit.
- **System Memory** - 2GB of RAM (4 GB or more recommended).
- **Video Card** – 1 GB of video memory (2 GB or more recommended).
- **Processor** - 4 cores (8 cores recommended).
- **Browser** - Microsoft Internet Explorer 11 or higher.

Basic Project Settings

Project Settings, including general settings, terrain parameters, flight model, and application layout are saved in the .Fly file and applied each time this file is used.

To open Settings dialog: **Home** tab > Click **Project Settings** > Click required tab.

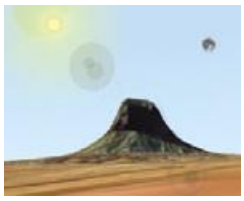
Environment Tab

- Select a **Sky** Color.
- Select **Sky Texture** and **Clouds Map** to apply.

Terrain Database Tab

- Select the local or remote **Terrain** (MPT) **Database** currently used by this project.
- Enter the **Number of Terrain Imaginary** (resolution) **Levels** that are used to enhance the visual quality when the camera is close to the ground.
- Set the project's **Terrain Coordinate System**.

Date and Light Tab



- Select the **Use Sunlight** option button if you want the sun to serve as the light source for the project.
- Select a range for the Date and Time Slider.

General Tab

Set basic parameters for the .Fly file, including startup message parameters:

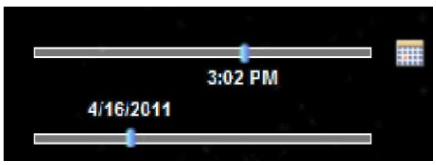
- Click **Set as Home** to set the current camera location as the default startup position for this .Fly file.
- Click **Add Message** to determine the message to be shown when the project is opened.
- Click **Wait** to set the number of seconds TerraExplorer waits at the beginning of the session before starting the Auto-Start procedure or allowing manual flight.

More about: Using project settings >

Controlling Date and Time

When the sun is used as a project's light source, displayed light on the terrain corresponds to the date/ time selected on the Time Slider. Project data containing timespan tags displays on the terrain according to the timespan set.

1. **View** tab > Select **Time Slider**. The Time Slider displays in the 3D Window. Drag the blue marker and yellow arrow  together to the required date and time on the slider. If you want to display data whose timespans fall anywhere in a time range, drag the blue marker to the start point of the time range and the yellow arrow to the endpoint of the time range 



2. Click **Date and** Time **Settings** icon  to the right of the slider to select a time zone, and time slider range. (When a one-year range is selected, two sliders display, one for the date, and one for the time of day).

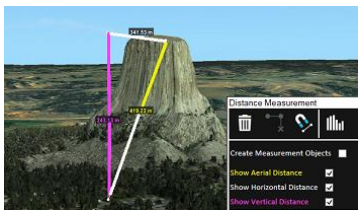
   Note: Project startup settings for the date and time can be set in the Date and Light tab in the Project Settings dialog box and are saved in the .Fly file. Any date and time settings made using the **Date and Time Settings** icon are not saved to the .Fly.

More about: Setting data and time >

Analysis Tools

TerraExplorer measurement and terrain analysis tools deliver extensive topographical and strategic information, enabling a more accurate geospatial understanding of the terrain.

Measurement, Line of Sight and Shadow Tools



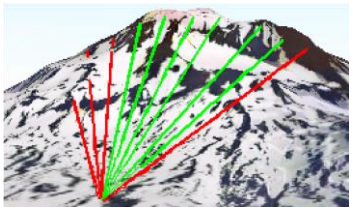
Aerial / Horizontal / Vertical Distance

1. **Analysis tab > Distance**. Select which distance lines to display.
2. To snap the points to another edge, object, or vertex, click **XYZ Snap Magnet** .
3. Click any point in the terrain or on an object to define the start point and other segments. Right-click to finish.



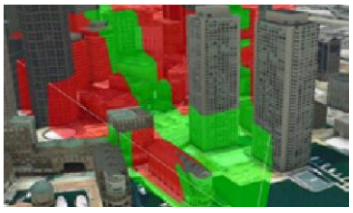
Terrain Area (and Perimeter)

1. **Analysis** tab > **Area** > Click **Horizontal Plane Area** or **3D Plane Area** .
2. Click to define start point. Drag to additional points and click to define a region. Right-click to finish.
3. To calculate surface area, enter **Terrain surface sample interval**, and click **Terrain Surface Area** .
4. **to set the measurement points based on the mouse** and **snap the point to another edge, object, or vertex, click XYZ Snap Magnet** .



Line of Sight - Indicates whether specific locations in the 3D World can be seen (green line) from a selected position or not (red).

1. **Analysis** tab > Click **Line of Sight**.
2. In **property sheet**, set parameters > In **3D Window**, click to define observer viewpoint, then click additional times for targets. Right click to finish.



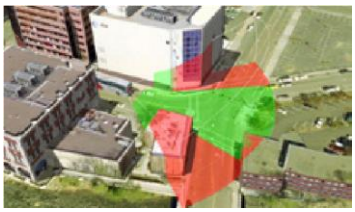
3D Viewshed - Create a 3D viewshed on buildings/ models and bare terrain.

1. **Analysis** tab > **Viewshed** > Click **3D Viewshed**.
2. In **3D Window**, click to define your viewpoint for the 3D viewshed, and then click again to define your desired endpoint.
3. In **property sheet**, set parameters such as visible/hidden area color and viewshed **Distance** and **FOV**.



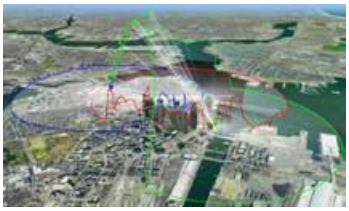
Viewshed Query - Analyze the visibility from multiple viewshed observer viewpoints to a selected area.

1. **Analysis** tab > **Viewshed** > Select **3D Viewshed Query**.
2. In the dialog box, set the **Query** parameter defining which viewsheds are analyzed, and all other parameters.
3. Select a method of designating the area for the viewshed query (Follow Line, Fill Area, Selected Group, From Clipboard, or Viewshed Area).



Viewshed on Route - Represent the view from a series of points (route).

1. **Analysis** tab > Click **Viewshed on Route** > Select any of the following:
   - **3D Viewshed on Route By Speed/ 3D Viewshed on Route By Time** - Animated representation of visible terrain/ objects as object moves on defined route based on set speed/ over set time frame.
   - **3D Viewshed on Route Query** - Analyzes the visibility of a selected area from multiple viewshed observer viewpoints along a route.
2. Click in **3D Window** to mark route's waypoints. Right-click to finish.



Threat Dome - Indicates the volume visible from a given point on the terrain.

1. **Analysis** tab > Click **Threat Dome**.
2. In **property sheet**, set parameters including the output type > In 3D Window, click to define pivot point.



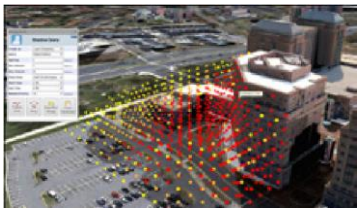
Shadow/Selection Shadow – Cast a shadow from all buildings and 3D models or only for selected objects.

Global shadow:

- **Analysis** tab **> Shadow**

Selection shadow:

1. Select the objects from which to cast a shadow.
2. **Analysis** tab > **Selection Shadow** > Click **Show Selection Shadow**.

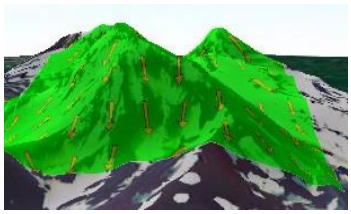


Shadow Query - Calculate and graphically represent overall shadow coverage or a particular object's shadow effect in a specified area.

1. **Analysis** tab > Click **Shadow Query**.
2. Set the **Query** parameter defining which objects' shadows are queried.
3. Select a method of designating the area for the shadow query (Follow Line, Fill Area, Selected Group, or From Clipboard).

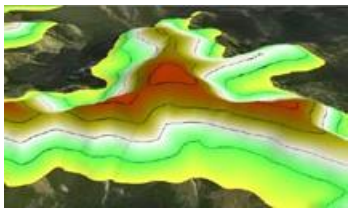
More about: Measurement, line of sight, and shadow tools >

Terrain Analysis Tools



Slope Map - Apply palette colors (slope degree) & slope arrows (slope direction).

1. **Analysis** tab > Click the arrow next to **Slope Map** and select either:
   - **Global Slope Map -** Applies default slope map to entire terrain and 3DML
   - **Custom Slope Map -** Advanced slope map with customizable parameters (e.g. coverage area, palette): select: Slope Colors/Slope Dir./Both
2. For Custom Slope Map, in **property sheet**, set **Coverage Area** and **Palette**.
3. If you selected **Rectangle Coverage Area**, click in **3D Window** to add opposite corners of the coverage rectangle.



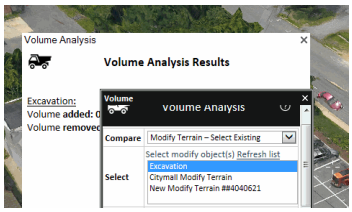
Contour Map - Apply palette colors to each elevation level and connect points of equal elevation with contour lines.

1. **Analysis** tab > Click the arrow next to **Contour Map** and select either:
   - **Global Contour Map** - Applies contour map to entire terrain and 3DML.
   - **Custom Contour Map Object -** Advanced map, customizable parameters.
2. For Custom Contour Map, in **property sheet**, set **Coverage Area**, **Palette,** etc**.**
3. If Coverage Area set to Rectangle, click in **3D Window** to draw rectangle.



Flood Tool - Calculate land covered by flooding.

1. **Analysis** tab > Click **Flood**.
2. In **property sheet**, set **single instance** of water level rising or **continuous** and related parameters.
3. In **3D Window**, click center of coverage area, and drag mouse to required radius size and click.



Volume Tool - Analyzes volume of terrain/model modified by Modify Terrain/ 3DML objects or volume difference between elevation layer & base terrain.

1. **Analysis** tab > Click **Volume**.
2. **Compare** field > Select an analysis mode.
3. Perform the steps relevant to the selected mode:
   - **Modify Terrain - Draw New**: Click **Create Modify >** In **3D Window**, draw polygon.
   - **Modify Terrain - Select Existing:** Select a modify object & click **Start Calculation**.
   - **Elevation Layer:** Mark your area of interest by drawing area or in location of all polygon clipboard objects.



Best Path - Calculate best path without exceeding definable climb and descent slope limits.

1. **Analysis** tab > Click **Best Path**.
2. In **property sheet**, set parameters > In **3D Window**, click to define start and endpoint.

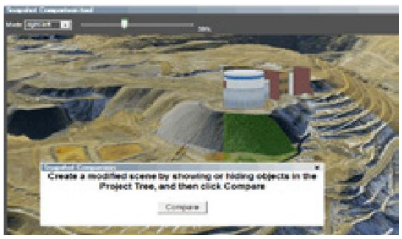


Terrain Profile - Display terrain elevation profile along a defined path, and related information (e.g., maximum/ minimum elevation values, slope).

1. **Analysis** tab > Click **Terrain Profile**.
2. Select profile mode: **Normal** - Display profile for selected polyline(s) OR **Compare** - Compare polyline's profile to specified elevation layer's.
3. If you selected **Compare** mode, select elevation layer for comparison.
4. Select methods of designating the polyline(s) for terrain profile:
   a. **Follow Line** - Terrain profile created along line drawn in **3D Window**.
   b. **Selected Group** - Terrain profile created for polylines in selected group.
   c. **From Clipboard** - Terrain profile created for polylines in clipboard.

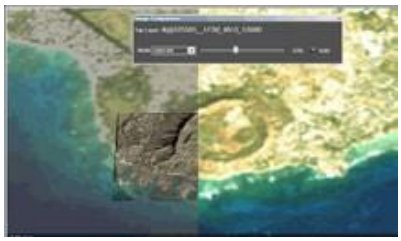
More about: Terrain analysis tools >

Comparison Tools



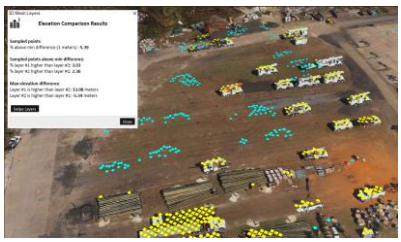
Swipe Snapshots - Create and compare snapshots showing different versions of the area in view in the 3D Window by showing or hiding objects in the Project Tree.

1. Navigate to required area and click **Analysis** > **Swipe** > **Swipe Snapshots**.
2. Show/hide objects in the Project Tree, and click **Compare**.
3. **Mode selection** - Choose between 4 clipping modes and Transparency mode.
4. **Slider control** - Define the clipping or transparency level extent.



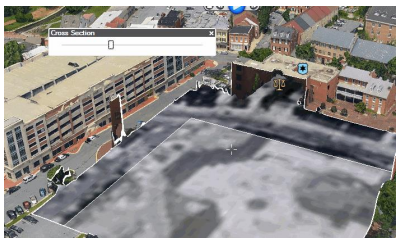
Swipe Mesh, Point Cloud, and Imagery - Compare 2 layers or a layer to base terrain by dynamically clipping or modifying transparency of overlaying layer.

1. Zoom in on an area with a visible imagery layer.
2. **Analysis** tab > **Swipe** > **Swipe Layers**.
3. Click any of the following: 3D Mesh, Point Cloud, and Imagery to filter the selection to the layer type(s) you want. Click **Refresh & Auto-Select** to auto-detect layers in view.
4. **Model display style** – Select mesh model display style if comparing mesh.
5. **Slider control** - Define the clipping or transparency level extent.



Elevation Comparison - Compare elevation of two elevation, feature, point cloud or mesh layers or between layer and base terrain.

1. **Analysis** tab > **Elevation** > Select **3D Mesh, Point Cloud, Elevation** or **Feature**.
2. Select the layers from the two drop-down lists, and minimum elevation difference between the layers that should be marked.
3. Mark area by drawing area polygon or from clipboard.
4. Review analysis in results dialog and graphically represented by the generated point feature layer.



Cross Section –Exposes obscured sections of the 3D View by making a horizontal or vertical straight cut.

1. **Analysis** tab > Click **Cross Section**.
2. Set the required settings (e.g. Transparency) and then click **Start**.
3. In the **3D Window**, click to create a cross section. Then use the Cross Section slider to adjust the position of the cross section plane.
4. Click **Stop** to exit the particular cross section.



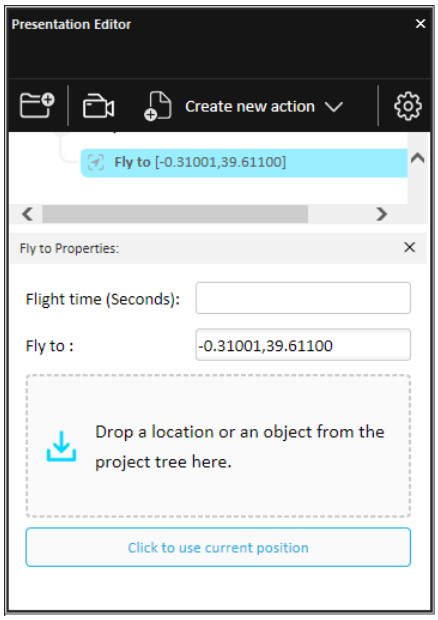
Buffer Query – Scans for all 3D elements within a set buffer zone of a selected line and highlights them in the 3D Window.

1. **Analysis** tab > Click **Buffer Query**.
2. Set scan properties (e.g., buffer zone radius, scanning area).
3. Select polylines for buffer query: **From Clipboard** or **Selected Group**.
4. All query points in whose buffer zone 3D elements were found are colored in red. Click a red query point to highlight in red the 3D elements found.

More about: Comparison tools >

Creating and Editing a Presentation

Easily share your 3D visualization with others by creating a presentation that can be replayed, in which you combine a customized flight route with a particular display of the project. Presentations consist of a series of actions, which are organized into steps, to help you structure your presentation. Each action is added to the presentation from the “Create new action” dropdown list in the toolbar at the top of the Presentation Editor.



Step 1: Create a flight route - Animate movement over the terrain by recording your navigation or by adding locations

Open the Presentation Editor

- **Home** tab > **Presentation** > in the presentation control panel, click **Open Presentation Editor** .

Creating a Recorded Route

1. **Presentation Editor** > **Create New Action** list > **Record Route**.
2. Click **Start Recording** and then navigate freely in the 3D Window to any location or point of interest.
3. Adjust zoom, tilt, etc.
4. **Presentation Editor** top panel > **Stop Recording**.

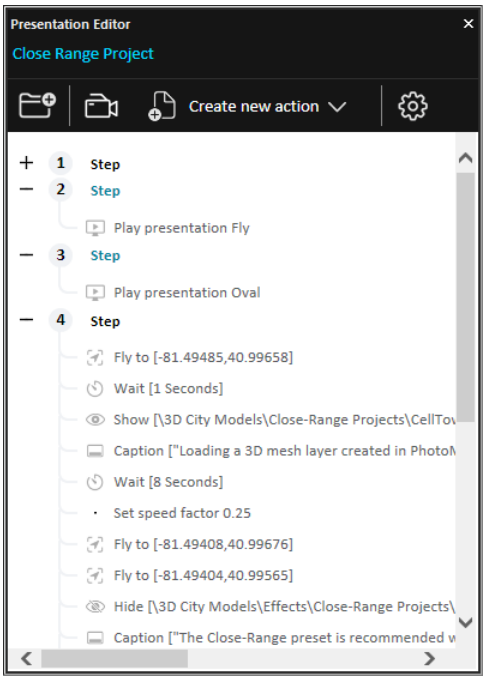
Creating a Locations Route

1. **Presentation Editor** > **Create New Action** list > **Fly to Location/Object Route**. This adds the current location**.**
2. To change the location, fly to the required location and then click **Click to Use Current Position** or drag and drop a location from the **Project Tree** into the **Presentation Editor.**.

Step 2: Animate what is displayed on the terrain:

- Determine what is visible on the terrain and in the 3D Window - **Show** or **Hide**: objects, groups, slope/contour map, shadows and messages.
- Add captions
- Set time and date
- Launch a different presentation from the current one.

In **Presentation Editor** > **Create New Action** list> Select an operation.



Step 3: Edit the presentation

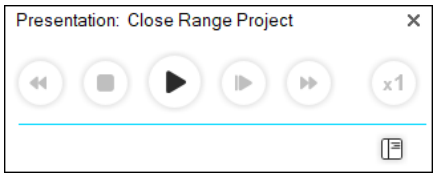
Add Steps - "Chapter" Headings to Organize Presentation Actions

1. **Presentation Editor’s** top toolbar > **Create New Step** .
2. Type step name. Set **Requires Click** to True to require user click to advance. Drag presentation actions from one step to another to organize.

Set Wait Times and Transitions

1. **Presentation Editor** > drag actions/steps to reorder steps as required.
2. In the **Create New Action** list, select **Set Wait Time**. Then enter the number of seconds to wait.

Step 4: View the presentation



In the **Project Tree**, double-click the required presentation. Use the control panel to start, stop, jump to previous/next action or step, and set time factor.

More about: Presentations >

Creating Movies

Share your 3D visualization even with people who do not have TerraExplorer installed, by creating a movie in MP4 or AVI format from any presentation in your project.



1. Create a presentation.
2. **Presentation Editor's** top toolbar > **Create Movie** .
3. In **Settings** dialog, set size of each frame and whether to hide screen overlay.

Basic Objects

Add and edit graphic entities, each with its own styling properties. Objects include: labels, lines, polygons, 2D/ 3D shapes, 3D models, and buildings. Available objects depend on TerraExplorer license level. Objects can be organized in Project Tree groups.

Creating an Object

1. **Objects** tab > Click <required object>.
2. Click and draw the object in the **3D Window**. Right-click to finish. For 2D and 3D shapes, left-click to finish.

Selecting an Object

After selecting a single object, a yellow frame surrounds the object and the object's property sheet opens. When selecting multiple objects, a yellow frame surrounds each of the selected objects and the Multi Edit property sheet opens.

Selecting a Single Object

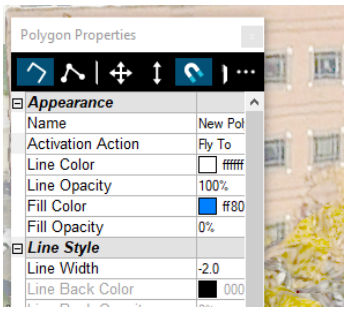
- From **Project Tree**: In **Project Tree**, right-click object > from the shortcut menu, select **Properties.**.. OR
- **From 3D Window**: On **Home** tab, click **Select** > In **3D Window**, select object.

Selecting Multiple Objects

- From **Project Tree**: In **Project Tree**, select the required objects (Use SHIFT and CTRL to select sequential and non-sequential tree items) > right-click > from the shortcut menu, select **Properties**.
- From **3D Window**: On **Home** tab, click **Select** > Press and hold the CTRL key > In **3D Window**, select each of the objects you want > In **3D Window**, right-click and select **Properties**.
- **From 3D Window (all objects in a selected area):** On **Home** tab > **Select** > **Area Selection** > In **3D Window**, draw area polygon by clicking (at least three points) and right-click to finish > In **3D Window**, right-click and select **Properties**.

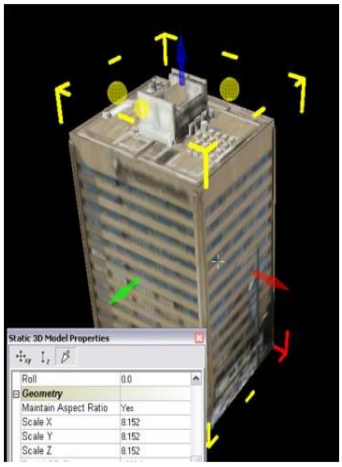


Editing an Object



1. **Project Tree** > Right-click object and select **Properties**.
2. On the top of the **property sheet**, click  to edit the entire object. Then:
   -  To move the object. Drag to required location.
   -  To change the object's altitude. Drag to required height.
   -  To move the object based on where the mouse is pointing (rather than according to XYZ offset).
   -  To set position based on mouse and snap the object to another object. Drag to required location.
3. To edit object nodes (of polylines, 2D polygons, and 3D polygons), click . Then:
   -  To move a node. Then click required node and drag to new location.
   -  To change node's altitude. Then click required node and drag to new height.
   -  To move a node based on where the mouse is pointing (rather than according to XYZ offset).
   -  To set position based on mouse and snap the object to another object. Then click required node and drag to required location.
   - To delete a node, point to the node, right-click, and select **Delete Node**.
   - To add a node, point to one of the object's lines, and click anywhere a red node appears.
4. Set properties such as color, altitude, timespan, tooltip, and texture in the object's property **sheet**.

Adding 3D Models



1. **Objects** tab > Click **3D Model**.
2. In dialog, browse to the required file to load.
3. In **3D Window**, click mouse to define position of model's pivot point on terrain.
4. Adjust the model's position and size in the 3D Window or from **property sheet**. **See: "**Editing an Object**."**
5. Using the **property sheet**, set the parameters of the 3D object.
6. Drag any of the three arrow resizers in/ out to adjust any of the model's dimensions.

More about: Creating and editing objects >

Advanced Objects

Create advanced objects: e.g., dynamic objects, modify terrain objects, video, buildings, and 3D models.

Creating and Editing Dynamic Objects

1. **Objects** tab> **Dynamic Objects** group> Click <required object >.
2. **Property** sheet > **File Name** field > Browse for a model file.
3. In **property sheet**, set **Motion Style** and other properties.
4. In **3D Window**, click mouse to define waypoints. Right-click to finish.
5. For editing, see: "Editing an Object." Note that object nodes correspond to object's route waypoints.

Creating Buildings

1. **Objects** tab > Click **Building**.
2. In **3D Window**, click the mouse to define roof polygon. Right-click to finish.
3. If there is no horizontal offset between roof and base, right click to finish. If there is an offset, drag base to place and left-click.
4. In **property sheet**, set building's properties including height, texture, and roof style.

Video on Terrain and Video Billboard

Play a video file on an area of the terrain or on a floating billboard.

1. **Objects** tab > **Video on Terrain/ Video Billboard**.
2. Browse to a video file. For a streaming video, click **Cancel**, and in **property sheet**, type the URL.
3. Set location of video:
   - In **property sheet**, set **Use Telemetry File** to No, and in **3D Window**, click to define location. **OR**
   - In **property sheet**, set **Use Telemetry File** to Yes, and browse to file
4. In **property sheet**, set projector properties and other video parameters.
5. To play, pause, and stop video, right-click in **Project Tree** and select required option.



More about: Dynamic and terrain objects >

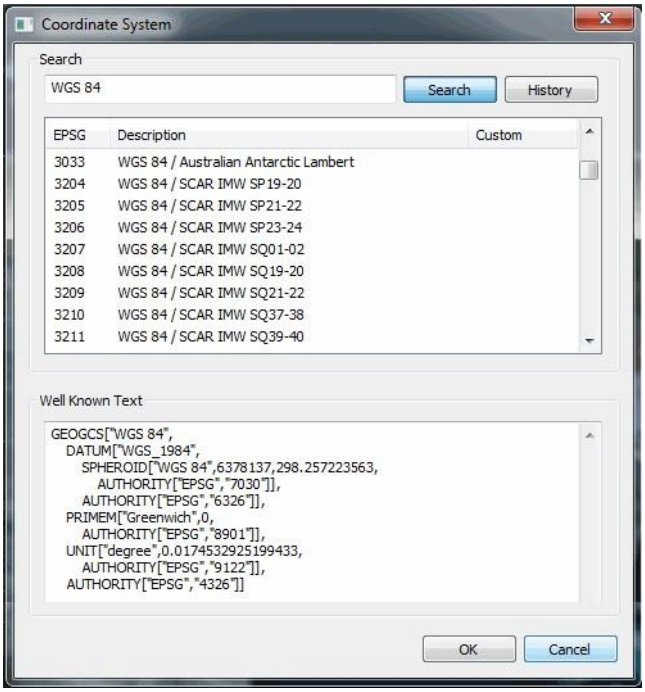
Working with Raster Layers

Raster layers include imagery layers containing geo-referenced, satellite or aerial images that overlay the terrain imagery, and elevation layers containing geo-referenced elevation raster that replaces the elevation data of the terrain.

Loading Raster Layers

1. **Home** tab > Click **Raster Layer** > Select **Elevation**/ **Imagery Layer** from file or from server.
2. In the dialog, browse to the required file, and click **Open**.
3. If loading from server, select the required server, and click **Select**. In the dialog that displays, enter the information required for the selected server, and select the required layer.

   Note: If the source file is geo-referenced it is positioned accordingly on the terrain. Otherwise, it is placed at the center of the 3D Window. You can then manually edit its position, or reproject it.
4. If the source file does not include **coordinate system** information or TerraExplorer cannot read it from the file, the Coordinate System dialog box opens. Specify the coordinate system of the layer. TerraExplorer then reprojects (converts) the layer data to the project's coordinate system. Although the source file retains its original coordinate system, it is placed on the terrain according to the reprojection parameters.



5. After the object has been placed on the terrain, you can change its properties using the property sheet. To clip a subsection of the raster, click the **Draw** button in the **Imagery/ Elevation** section of the **property sheet**. Place at least three polygon points in the 3D Window by clicking in the desired location. Finish by right-clicking.

Creating Resolution Pyramids

To enable the display of a layer at different altitudes, TerraExplorer requires a number of resolution levels per layer, also known as a resolution pyramid. If a layer does not have sufficient resolution levels, TerraExplorer can create them.

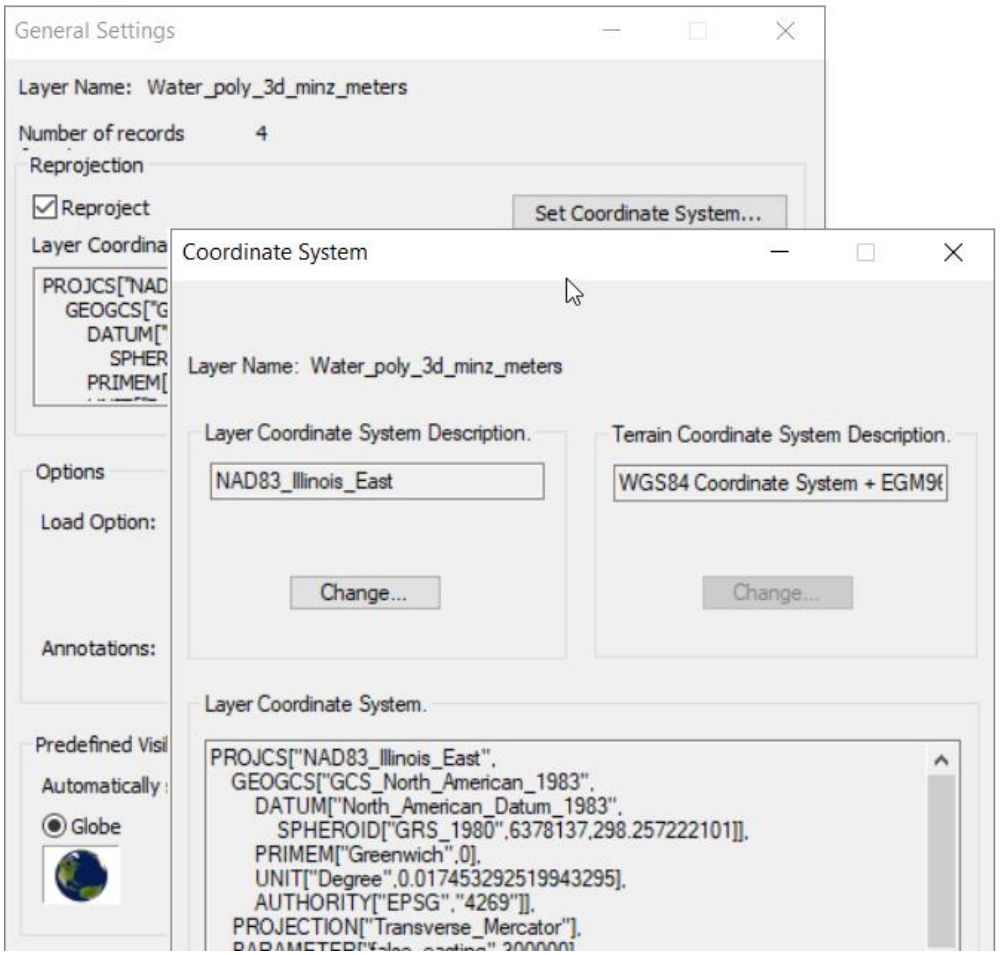
1. In **Project Tree**, select layers that require a resolution pyramid.
2. **Layers** tab > Click **Raster to MPT**.
3. In dialog, select layers, and click **Convert**.

More about: Raster layers >

Loading Feature Layers

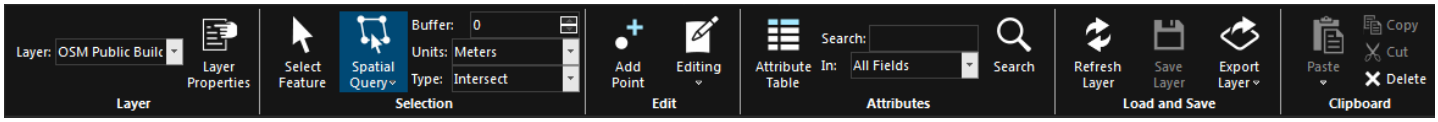
A feature layer is a visual representation of a geographic data set using geographic features such as points, lines, and polygons. In contrast to objects, all the features in a layer share the same properties and behavior. These properties can be modified from the layer's property sheet.

1. **Home** tab > Click **Feature layer**.
2. If loading from file, in dialog, browse to required file and click **Open**.
3. If loading from server, select the server type, and click **Connect**. Fill in the required Connection parameters for the specific server or database, and click **Connect**.
4. Select a layer from the **Select Layer** dialog box and click **Next**.
5. Set the layer's **General Settings**. Then click **Next**.
6. If the layer's coordinate system is different from the terrain's, select the **Reproject** check box.
7. Then click the **Set Coordinate System** button to open the Coordinate System dialog page to specify the **coordinate system** of the layer.
8. Select **Stream** to retrieve layer information dynamically based on the camera's position.
9. Select **Entire Layer** to load the **entire layer** when the .Fly file opens.
10. Select the **Annotation Symbol** check box to automatically add a point annotation object in the center of each layer feature.
11. In the **Predefined Visibility** section, select the viewer altitude from which visibility distance and scale is set to optimum.
12. Select the attribute fields to load. In the **property sheet**, set layer parameters, and apply different properties such as line color or cylinder height, based on the attribute field values of the objects.



Feature and 3DML Layer Operations

Spatial operations on a layer's features include: merging features into a single feature, clipping one polygon from another, exploding a multi-part feature into its individual component features, and exporting selected features to a new file. Feature layer operations are only enabled for TerraExplorer Pro users. Most operations are also available for 3DML layers.



Selecting Features (Individual Selection)

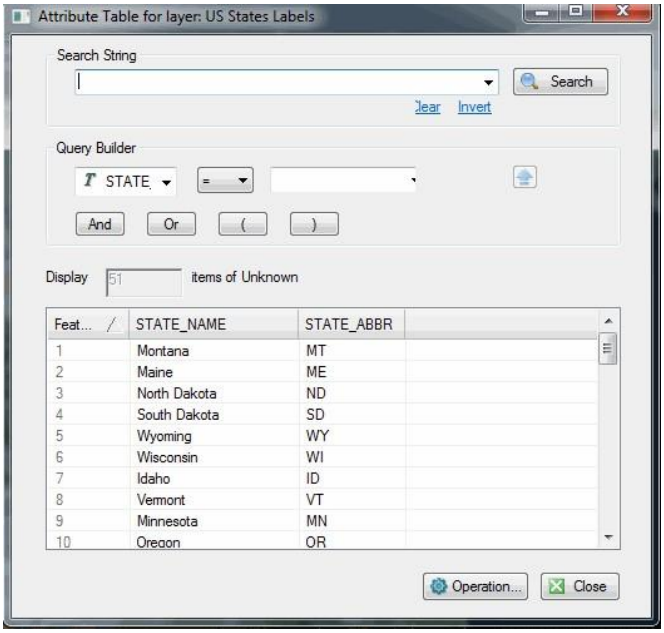
1. In **Project Tree**, select required layer.
2. Select the individual features required:
3. **Layer Edit** tab > Click **Select Feature**.
4. In the **3D Window**, select the required feature. (To select multiple features, press and hold the CTRL key) **OR**

Selecting Features by Spatial Query

1. **Layer Edit** tab > Click **Spatial Query**. Select **Area** (polygon), **Line**, **Point** or **Object**.
2. In the **Type** dropdown list > Select **Intersect** to select all features whose geometry intersects at any point with the selection geometry. Select **Completely Within** to select only features whose entire geometry falls within the selection geometry.
3. In the **Buffer** dropdown list, enter a buffer radius outside the selection.
4. In the **3D Window**, click to draw a polygon, line or point or select the required object for feature selection.

Using the Attribute Table: Searching for Features and Editing Attributes

1. In **Project Tree**, select required layer. Then **Layer Edit** tab > **Attribute Table.**
2. In the **Query builder** section, enter an attribute, condition, and value and click **Insert String**.
3. If you want to include additional strings in your search expression, click one of the connector buttons: (And, Or, ()) and repeat step 2 for the next condition. Then click **Search**.
4. To display on the terrain only filtered features, click **Operation** > Select **Show Exclusive**.
5. To create a new layer of filtered features, click **Operation** > **Add as new layer entry**.
6. To save the selected features to a new shapefile or .Fly file, click **Operation** > Select **Save As**.
7. To modify attribute properties, double-click the attribute value and modify as required.



Exporting Selected Features to a New File

1. Select the required features. **See: "**Selecting Features**."**
2. **Layer Edit** tab > Click **Export Layer** > Select **Save Selected Features As**.
3. In dialog, type a **File** name. Browse to the required Save location and click **Save**.

Adding a Feature to a Layer

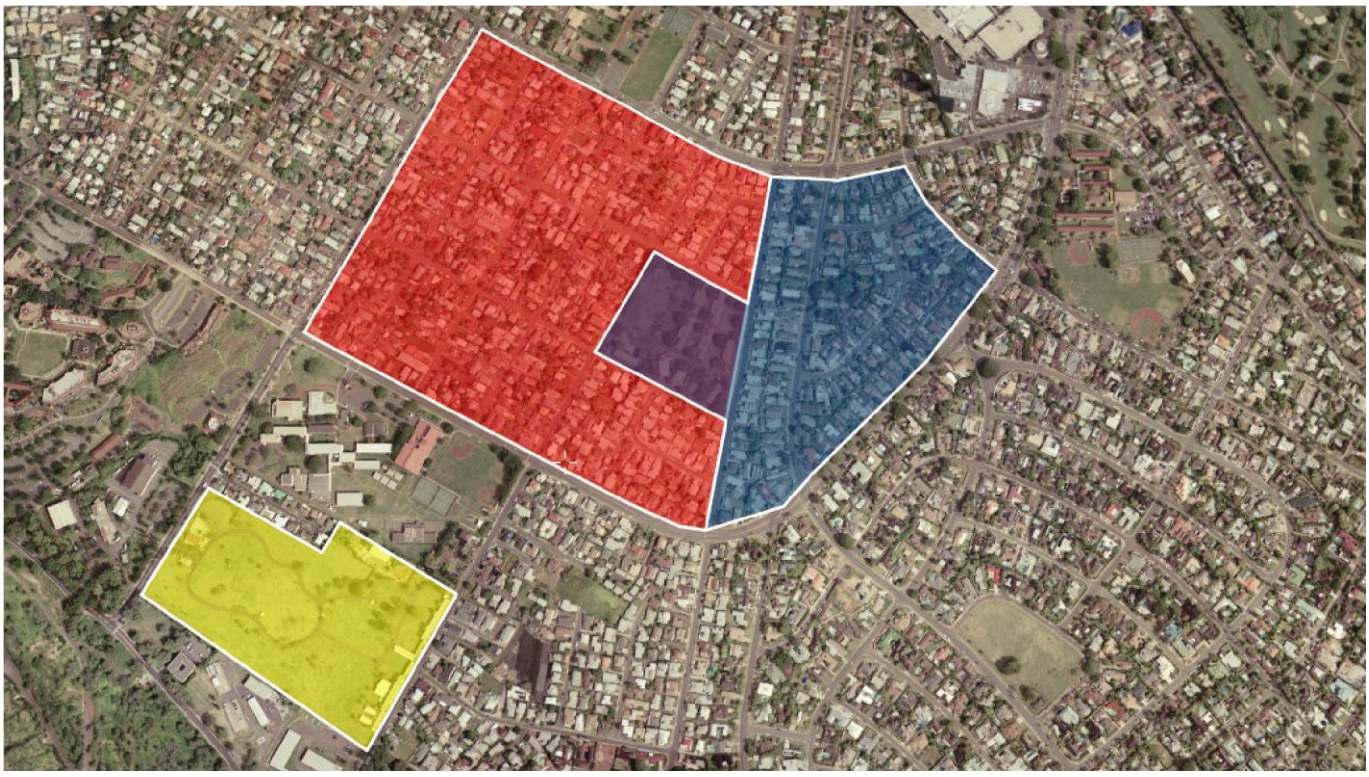
1. Select the layer. Then **Layer Edit** tab > Click **Add** [Polyline, Point, or Polygon].
2. In **property sheet**, set the parameters of the geographic feature. In **3D Window**, place the object's points. Right-click to finish.

Editing Features (Merge, Clip, Intersection, Explode)

1. Select required features (**Merge**: Only polylines/ polygons, **Intersection**, **Clipping**: Only polygons).
2. On the **Layer Edit** tab > Click **Editing** and select one of the following:
   - To **merge** features into one feature: select **Merge** > In **3D Window**, click feature whose attributes should be used for merged object.
   - To **clip**: select **Clip** > In the **3D Window**, click the polygon to clip from the other polygons.
   - To create new feature from **intersection** of features: select **Intersection** > In **3D Window**, click polygon that will determine attributes.
   - To **explode** a multi-part feature into component features: **Layer Edit** tab > Click **Editing** > To explode all features: select **Explode All**. To separate out only specific features: select **Explode**. Then, in **3D Window**, select features to separate out.

Saving a Layer

- On the **Layer Edit** tab, click **Save Layer** to save changes to original layer or Click **Export Layer** > **Save As** to save to a new file.



More about: Feature layer operations >

Working with 3D Mesh Layers (3DML)

Mesh layers are multi-resolution, textured mesh models that may include classification layers, as well as polygons from BIM datasets. They are created through automatic reconstruction methods, manual modeling, or building information modeling (BIM). Most mesh layers used in TerraExplorer are in Skyline's proprietary, stream-optimized 3DML format. DAE, OSGB, and 3D Tiles mesh layers are automatically converted to 3DML upon import.

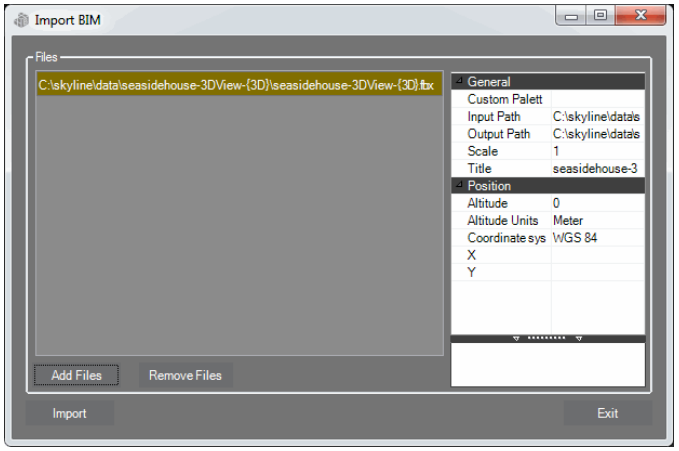
Loading and Importing Mesh Layers



1. **Layers** tab > Click **Load 3D Mesh** > Select any of the following:
   - 3D Mesh Layer from File – Then in dialog, browse to required file and click **Open**.
   - SkylineGlobe Server – Then search for the layer and click Load.
   - 3D Tile from URL – Then type the URL to the 3D Tile's root file, and click Load.
   - Import DAE Layer – Browse to the **3D Mesh Model** you want to import, and **Output Folder**. Select the polygon feature layers you want to use to classify areas of the mesh model. Click **Create.**
   - Import OSGB / 3D Tiles – Browse to the **Input Mesh Layer** you want to import, and **Output Folder**. Set the **Input/Output Coordinate System** if required. Click **Create.**
2. After the layer has been placed on the terrain, you can change its properties using the **property sheet**, and use attribute information included in a BIM or any 3DML with feature layers to display only selected areas of the mesh model that match a specific attribute value or colorize the mesh model based on attribute value.

Loading Building Information Modeling (BIM) Layers

TerraExplorer reads FBX and IFC BIM files and converts them to the 3DML format for optimized viewing and streaming on desktop/ mobile applications, with full support for spatial & attribute queries.

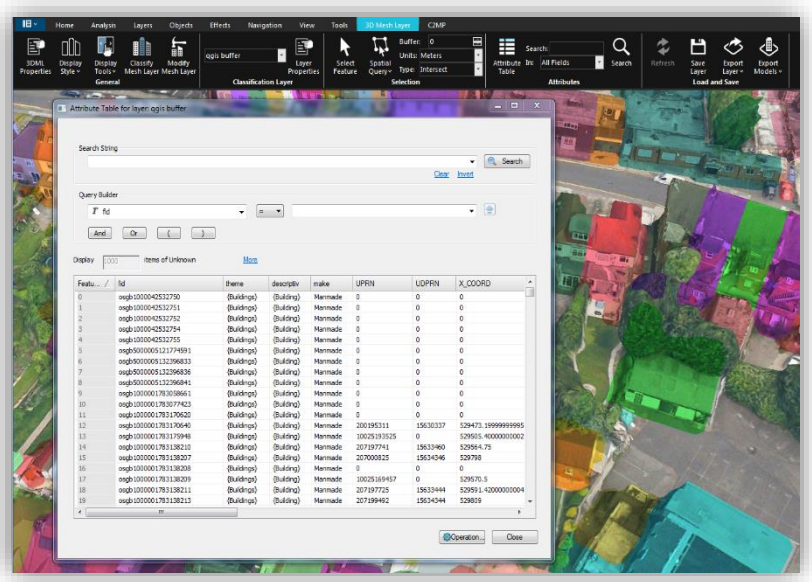


1. **Layers** tab > Click **BIM**.
2. Click **Add Files**. Then browse to the required file, and click **Open**.
3. Using the **property sheet**, set the BIM parameters as required.
4. Click **Import**.

Classifying 3D Mesh Layers (3DML)

Mesh layers are classified using polygon feature layers that enable you to visually distinguish different areas of the mesh layer, access the attribute data of the classification features and perform spatial and attribute queries on the feature layer that is classifying the mesh layer.

The classification is dynamic, reflecting any changes to the polygon features, and requires no pre-processing.

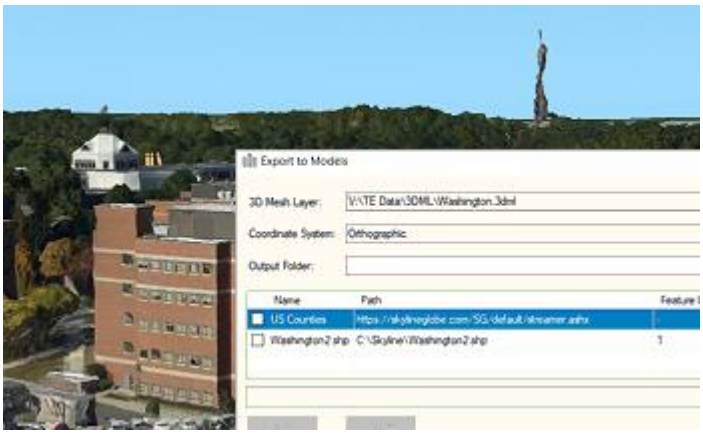


1. Load the required feature layer.
2. In the layer's property sheet, set the **Altitude Method** to Relative to Terrain or Absolute, and set the **Classification Mode**. This mode determines how to display the classification polygon: Classify by colorizing all objects and layers contained within the extruded polygon or Classify by displaying a 3D polygon (based on the extruded polygon).
3. Set the appearance, e.g., fill color, altitude, or visibility, of your classification polygons. Polygon properties can be based on layer attribute fields.

Exporting Mesh Layers to Other Formats

3DML can be exported to Cesium 3D Tiles and I3S formats. Export is supported for all mesh layers except for imported OGC 3D Tiles (B3DM) and 3DML created from models feature layers.

1. Select the mesh layer, and then on the **3D Mesh Layer** tab > Click **Export Mesh**.
2. Select an **Output Format**: Skyline 3DML, Cesium 3D Tiles or Esri I3S, and an **Output Folder**. Click **Add Files**. Then browse to the required file, and click **Open**.
3. Select the Output Coordinate System, and Reproject Elevation if required.
4. Click **Create**.



Exporting to Models

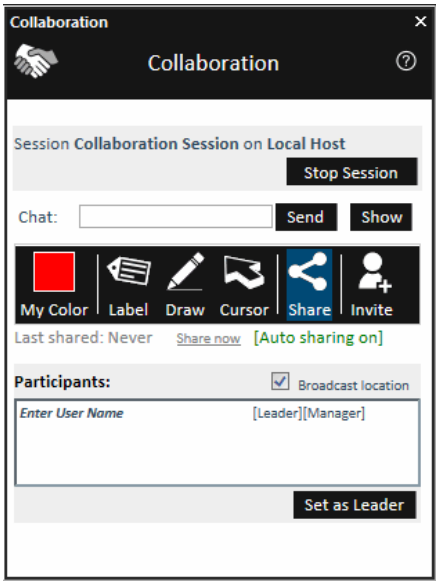
Polygonal areas of a mesh layer, e.g., buildings, can also be exported to individual OBJ models. Export is supported for all mesh layers except for imported 3D Tiles and BIM, 3DML created from models feature layers, and 3DML from SGS that do not have edit permission.

1. Select the mesh layer, and then on the **3D Mesh Layer** tab > Click **Export Mesh**, and select way to define areas to export:
   - **Export by All Classification Features**
   - **Export by Selected Features** > Select required features in classification layer.
   - **Export by External Feature Layers** > In dialog, select layers.
   - **Draw and Export Single Model** > Draw polygon around required model.
2. Browse to **Output Folder**, and click **Create**.

More about: Working with mesh layers >

Collaborating over the Network with Other TerraExplorer Users

Connecting over the internet/intranet, multiple users can work together in the 3D environment: chat, annotate the terrain with text labels and free hand drawing, synchronize flight, and share content by dragging any object/layer to a shared folder. One user serves as the manager of the session, while the rest connect to the session as clients.



The collaboration server can run on a local computer of one of the session members, or as part of an existing collaboration server (to enable better management and control and to solve security problems when accessing end-user computers behind firewalls).

When a collaboration server is activated, using the Start Local Session request, it serves the current session on a local machine and after the termination of the session the server shuts down. When the collaboration server is set up as part of an existing collaboration server it is always up and running.

Joining or Opening a Session

1. **Tools** tab > Click **Collaboration**.
2. Select a connection type:
   - **Create local session** - To start a communication server on your local computer, and serve as session manager/ leader.
   - **Create session** on server - To create a new session on a collaboration server of which you are the manager and leader. Then type the **Server host** name (name or IP address of the server).
   - **Join session** - To join an ongoing session opened by another user on a local computer or on a collaboration server. Then type the Server host name (name or IP address of the Manager's local computer or the collaboration server).
3. In the **Choose Session Name** field, type the session's name. If you join an ongoing session, type the session name that was given by the manager.
4. In the **Choose User Name** field, type a user name.
5. If you started a local or a server session, from the **On User Connection** drop-down list, select whether to send the Fly project or link to users who join the session.
6. Click the **Start Session** button to create the session or **Join Session** to join an ongoing session. A second Collaboration dialog box opens.

Managing a Session

If you created the session:

- To appoint a different leader, in **Participants** list, select name > Click **Set as Leader**.
- To send your camera position to other participants, **select Broadcast location**.

If you joined a session:

- To attach your 3D Window to leader's view, select the **Follow leader** check box. Clear to navigate freely.
- To invite participants to session, click **Invite**. Then in the **Enter Email(s)** field, type the e-mail address. Click **Invite**.
- Follow the instructions in the message body and send the mail.

Collaborating with Other Session Participants

You can chat, point, draw freehand, add and place text labels, and share content with other participants in the session.

More about: Collaborating >

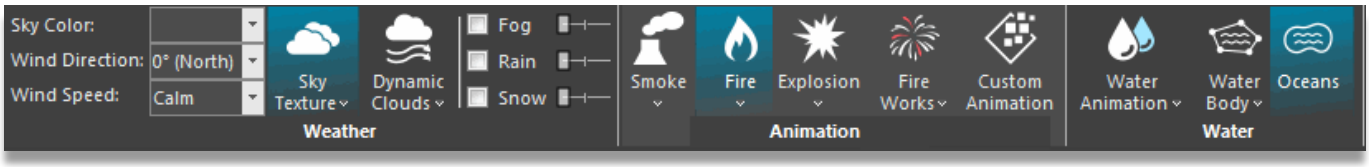
Loading .Fly and KML/ KMZ Files

When another TerraExplorer project (.Fly layer) or KML/KMZ file is loaded in TerraExplorer, the geographic content is read and put in the Project Tree as a group.

1. **Home** tab > Click **Feature layer** > Select .fly or **kml/ kmz**.
2. In dialog, browse to required file and click **Open**.

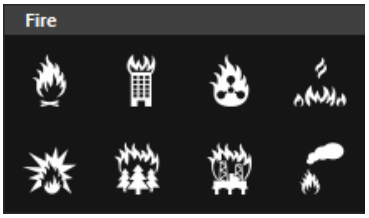
Effects and Animation

Simulation of weather, animation, light, and water effects enhance realism of the 3D visualization.



Weather Effects (clouds, wind, sky, sun, rain, snow, and fog)

On the **Effects** tab, in the **Weather** group, set any of the following: sky color, sky texture, dynamic clouds covering, wind direction, wind speed, fog intensity, rain intensity, and snow intensity.

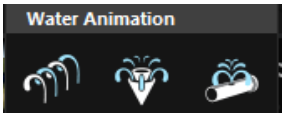




Animation Effects (e.g. fire, smoke, explosions).

1. **Effects** tab > **Animation** group, click required effect, and then from drop-down menu, select required shape.
2. In **Effect property sheet**, set the effect's parameters. To modify particle properties such as base image, color, size, and lifetime, click **Set** in the Effect **Setting** field, and then modify required parameters in Particle Editor.
3. Place effect object in **3D Window** by clicking desired location.









Water Effects (river, ocean, waterfall, fountain, pool)

1. **Effects** tab > **Water** group> **Water Animation** (e.g. fountain, pipe) **OR Water Body** (e.g. lake, pool), and select required effect. Then from drop-down menu, select required shape.
2. In **property sheet**, set effect's parameters. To modify particle properties, click **Set** in the Effect Setting field, and then modify required parameters in Particle Editor.
3. For **Water Animation**, place effect object in **3D Window** by clicking in desired location.
4. For **Water Body**, place the polygon points in **3D Window** by clicking in at least three locations. Right-click to finish.

Light Effects

- **Effects** tab > **Light** group> **Light Effect**, and select required effect. Then place the effect object in the **3D Window** by clicking in the desired location.

More about: Adding effect objects to enhance your 3D visualization >

Loading from SkylineGlobe Server (SGS)

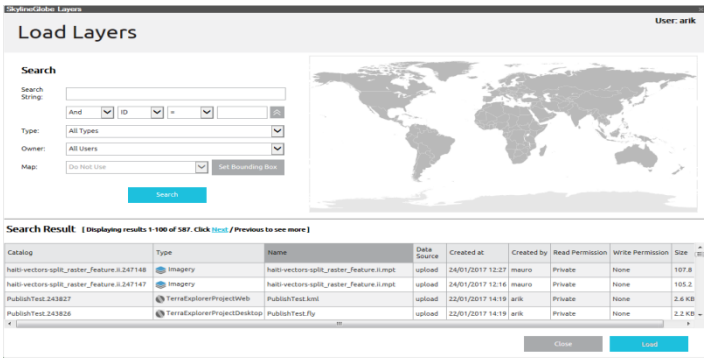
SkylineGlobe Server is a private cloud solution that provides a comprehensive set of web services for publishing, storing, managing and streaming 3D spatial data. SkylineGlobe Server provides streaming services for all your spatial data types including terrain (MPT/TBP), map (raster-WMS/WMTS), feature (WFS/WFS-T), 3D Mesh (3DML, 3D Cesium tiles), and point cloud (CPT, 3D Cesium tiles).

Logging In to a SkylineGlobe Server

1. Top right of application ribbon > Click **Log in**.
2. Enter login information > click **Log in**.

Loading a Project or Layer

1. For Project: **File** menu  > point to **Open** and select **Open Project from SkylineGlobe**.
2. For Layer: **Layers** tab > click **Load Layers**.
3. Search for required layer.
4. Select required layer and click **Load**.



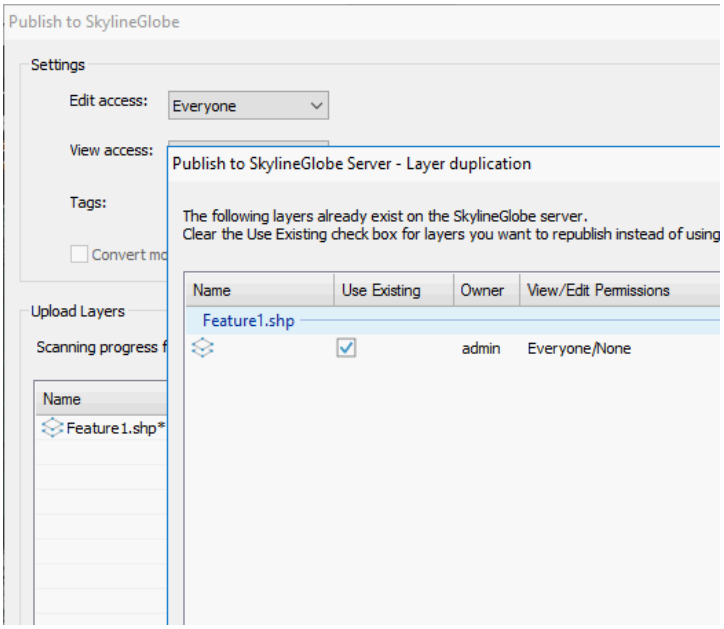
Searching SkylineGlobe Server for Layers

In SkylineGlobe Layers dialog box:

1. To search for string: In the **Search String** field, type a search string or enter an attribute, condition, and value and click **Insert String** .
2. To search according to geographic location: Click **Set Bounding Box** > select required region by drawing a rectangle on the map on the right side of the page.
3. Click **Search**.

Publishing to SkylineGlobe Server (SGS)

All publishing and uploading of layers and projects to the server can be done directly from TerraExplorer. Through a single publishing operation, data is made ready for consumption for all TerraExplorer clients: Desktop, Mobile, and TE for Web.



Publishing a Project or Layer to SkylineGlobe Server

1. For Project: **Home** tab > click **Publish to SG**.
2. For Layer: In Project Tree, right-click required layer > select **Upload to SkylineGlobe**.
3. TerraExplorer automatically checks for similar layers already on the server. If similar layers are found, you can select to Republish or Use Existing.
4. Clear the **Use Existing check box** for each layer you want to republish instead of using copy on the server. Then click **OK**.
5. Click **Publish**.

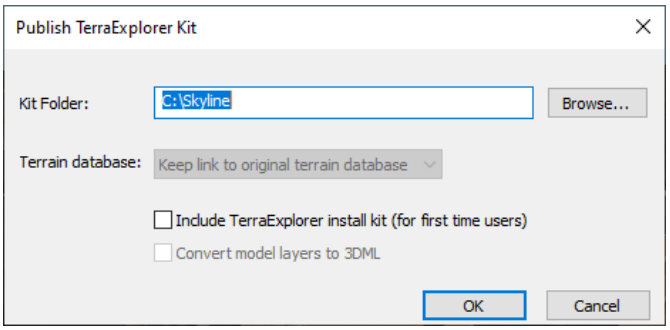
More about: Working with SkylineGlobe Server >

Other Publishing Options

The Publish TerraExplorer Kit process collects all the files that are used in the project and stores them in the target directory for distribution to external users using any external storage device r.

Publishing a Kit

1. Save project.
2. **Home** tab > Click **Publish Offline** > Select either **Publish Project as Local Kit** or **Extract and Publish Area as Offline Kit**.
3. For Publish Project as Local Kit: > In the dialog that opens, in Kit field, browse to folder for kit files.
4. In the **Terrain** field, select whether to copy the terrain database to kit, to keep a link to database, or not copy (to save space).
5. Select the **Include TerraExplorer install kit** check box for user who doesn't have TE installed > Click **OK**.



6. For Extract and Publish Area as Offline Kit (Create a directory for offline use that contains the terrain, layers, objects, and resources of a selected subset of the TerraExplorer project): > In the dialog that opens, in Kit field, browse to folder for kit files.
7. In the **Output Project** section of dialog, click **Create** and mark area of interest by drawing a clip polygon in **3D Window**.
8. When updating existing offline kit, if want to accelerate process by skipping terrain and layer extraction for existing files, select relevant check boxes. > Click **Publish**.

More about: Publishing TerraExplorer projects >



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