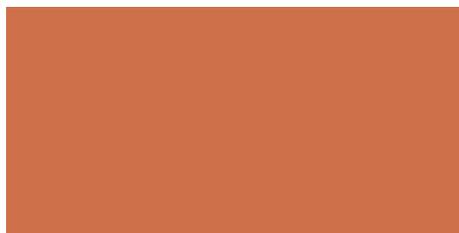




Extensis
GeoViewer

USER MANUAL



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GeoViewer v9.0 // 11 March 2022

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GeoViewer overview

GeoViewer is an application for viewing raster, vector, WMS, and LiDAR imagery. GeoViewer supports a broad range of file formats, including the industry standard MrSID format and the ISO standard JPEG 2000 format.

IMPORTANT

Extensis has discontinued development for this incarnation of GeoViewer. Because of this, we are making the GeoViewer Pro upgrade available to all users at no charge. GeoViewer Pro has no additional system requirements but offers additional features.

For upgrade instructions, see ***Upgrading to GeoViewer Pro*** on page 8.

Here are some of the tasks that you can perform in GeoViewer:

- Display multispectral imagery and select the image bands that you want to display.
- View image metadata, including projection information.
- Display an OpenStreetMap layer as a base map.
- Browse and display imagery from a WMS server that you specify.
- Change the map's projection to view images in their native projection, in WGS 84, or in Web Mercator.
- Display LiDAR point clouds in 3-D.
- Create bookmarks for frequently accessed locations.
- Measure distances.
- Export images or portions of images.
- Use dynamic range controls to improve the way that images are displayed.
- **GeoViewer Pro:** Print images or portions of images that you specify.
- **GeoViewer Pro:** Create image tiles when you export images.
- **GeoViewer Pro:** Change the map's projection to additional supported projections.
- **GeoViewer Pro:** Display the area of shapes that you draw on the map.

About this document

The **GeoViewer User Manual** is written for geographic information system (GIS) professionals that want to view geospatial imagery, including raster imagery, WMS imagery, vector imagery, LiDAR imagery, and more. This guide assumes that you have basic knowledge of GIS, including knowledge of projection systems. This guide describes how to install and use GeoViewer.

New features

GeoViewer 9.0 includes the following new features and enhancements:

- **Printing (available with the GeoViewer Pro upgrade*)**
Print one or more images that you add to the map. When you print images, you can print the visible area, print custom areas, or print the full extents of all layers on the map. You can print at native resolution or automatically fit images on the number of pages that you specify (for example, specify to fit images in an area two pages wide and two pages high).
- **Bookmarks**
Create bookmarks to save areas of interest that you access frequently. You can edit, delete, and export bookmark areas. With GeoViewer Pro, you can also print bookmark areas.
- **Changing the Map's Projection**
Reproject images to another projection that you specify. By default, you can display images in their native projection, in WGS 84, and in Web Mercator. With GeoViewer Pro, you can reproject images to additional supported projections.
- **OpenStreetMap Support**
Display an OpenStreetMap layer as a base map. The OpenStreetMap layer is excluded from export jobs and print jobs.
- **Dynamic Range Stretching**
GeoViewer automatically uses dynamic range stretching to improve the appearance of a 16-bit raster. You can change dynamic range stretching for a specific layer or for all layers.
- **Area Measurement (available with the GeoViewer Pro upgrade*)**
Display the area of shapes that you draw on the map.
- **Location Search**
Search for geographic coordinates.
- **JPIP Improvements**
When you access JPIP imagery, GeoViewer reads projection information from the JPIP server to display imagery in the correct location. Additionally, if you access the JPIP component of an Express Server, you can browse a list of the imagery available on the server.
- **Tiled Image Export (available with the GeoViewer Pro upgrade*)**
When you export imagery from GeoViewer, you can select tiling options. You may want to create image tiles when you export very large images.
- **Expanded File Format Support**
You can now view 16-bit images and images in the CADRG and PNG file formats.
- **Auxiliary File Support**
GeoViewer now reads projection information from auxiliary files in the **aux.xml** format automatically. The projection information from **aux.xml** files takes precedence over image metadata and over world files as well.

* See *Upgrading to GeoViewer Pro* on page 8.

System requirements

Before you install GeoViewer, verify that your system meets the minimum system requirements.

Operating system requirements

You can run GeoViewer on 64-bit versions of Microsoft Windows. GeoViewer supports:

- Windows Server 2012
- Windows 10
- Windows 8
- Windows 7

NOTE: GeoViewer may work on newer versions of Windows. Since Extensis has discontinued this incarnation, we have not tested nor can we support using GeoViewer on newer systems.

Hardware requirements

For optimal performance, verify that your system meets the following recommended hardware configuration:

- 2.5 GHz quad core processor
- 4 GB RAM
- 200 MB of disk space for installation and additional space for images
- SATA drive or better

It is possible to run GeoViewer on systems with the following minimum hardware configuration:

- 1.5 GHz processor
- 1 GB RAM
- 200 MB of disk space

Software requirements

GeoViewer requires the following software to run:

- Microsoft .NET Framework 4.5
- Microsoft DirectX 9
- Visual Studio C++ 2013 Redistributable

If this software is not already present on your system, the GeoViewer installer downloads and installs the software for you.

NOTE: Microsoft DirectX is used to display LiDAR imagery in 3-D.

Installing GeoViewer

To install GeoViewer:

1. Download the GeoViewer installer from [GeoViewer 9 Support](#).
2. Navigate to your Downloads folder and double-click **setup.exe**. This starts the installation wizard.
TIP: To install GeoViewer for all users, right-click **setup.exe** and choose **Run as administrator** from the shortcut menu.
3. In the installation wizard:
 - Accept the License Agreement.
 - Select whether you want to install GeoViewer for the current user or all users.
NOTE: In order to install for all users, you must run the installer as an administrator.
 - Select the directory where you want to install GeoViewer.
 - Install the Microsoft .NET Framework, DirectX 9.0, and the Visual Studio C++ Redistributable if these are not already installed.

Upgrading to GeoViewer Pro

GeoViewer Pro is now a free upgrade.

To upgrade to GeoViewer Pro:

1. Start GeoViewer.
If you installed GeoViewer for all users, then right-click the GeoViewer icon and choose **Run as administrator** from the shortcut menu.
2. Choose **Options > Purchase Pro license**.
If the menu instead reads **View license** then you have already upgraded GeoViewer.
3. Enter the following into the **License code** field (you can copy and paste the text between and including the * and the #):

```
*D
ScTOEjjaffBwHQzWKxdaV7425q1,7WFLXpxYzVRixdVyhy0iRowYtVMbH12RwofP3RbTzjdny0
:cUm1asW9zhhLqVzGD6K1KAhUeTMLQ5KZbf1#
```

4. Click **OK**.

You should see a message that licensing succeeded, and the **View License** dialog should show **License status: Licensed**. If this process wasn't successful, then please read the article [Activating the Pro features in GeoViewer for free](#).

Updating GeoViewer help

While the functions of GeoViewer have not changed, GeoViewer help has been updated to include contact information for Extensis.

We have made the updated version of GeoViewer help available to download and replace the original version, or you can choose to link to an online version of GeoViewer help instead.

Downloading GeoViewer help

If you want to update the local version of Help (installed with your copy of GeoViewer):

1. Locate the existing help system **docs** folder.
By default, it is in **C:\Program Files\LizardTech\GeoViewer** (all users installation) or **C:\Users\<user>\AppData\Roaming\LizardTech\GeoViewer** (single user installation); if you installed GeoViewer to a non-standard location, you can find the help system by launching GeoViewer and choosing **Help > Help topics**, then reading the location in the browser's URL bar.
2. Rename the existing **docs** folder (something like **docs_old**).
This is just in case you want or need to revert to the older help system, and also saves the PDFs that were installed with GeoViewer.
3. [Download a copy of this help system](#).
4. Decompress the **.zip** file (this should yield a folder named **docs**).
5. Move the new **docs** folder into the **GeoViewer** folder (where **docs_old** is located).
6. Quit and restart GeoViewer, then choose **Help > Help topics** to see the new help system.

Activating the Pro features in GeoViewer for free: <https://help.extensis.com/hc/en-us/articles/360016374714>
GeoViewer help (install locally): <https://bin.extensis.com/geoviewer/docs.zip>

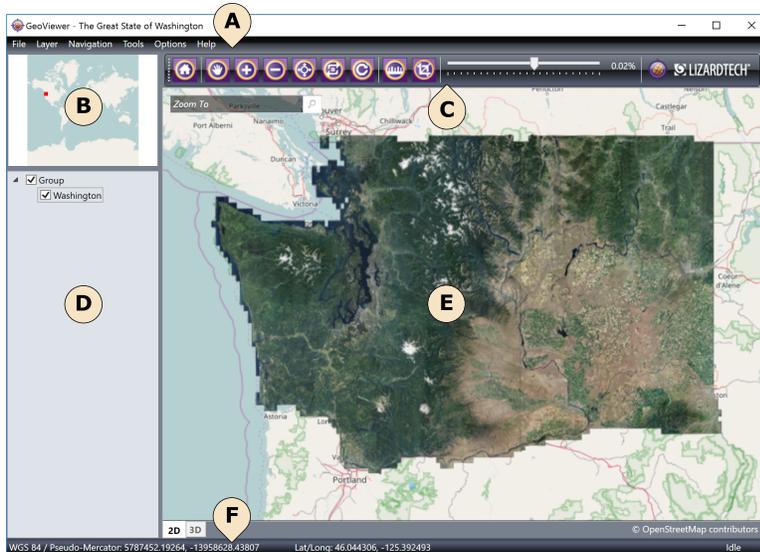
Linking to GeoViewer online help

If you would rather link to an online version of this help system:

1. Locate the existing help system **docs** folder.
By default, it is in **C:\Program Files\LizardTech\GeoViewer** (all users installation) or **C:\Users\ (single user installation); if you installed GeoViewer to a non-standard location, you can find the help system by launching GeoViewer and choosing **Help > Help topics**, then reading the location in the browser's URL bar.**
2. Rename the existing **docs** folder (something like **docs_old**).
This is just in case you want or need to revert to the older help system, and also saves the PDFs that were installed with GeoViewer.
3. [Download this file](#).
4. Decompress the **.zip** file (this should yield a folder named **online_docs**).
5. Move the **online_docs** folder into the **GeoViewer** folder (where **docs_old** is located).
6. Rename the **online_docs** folder to **docs**.
7. Quit and relaunch GeoViewer, then choose **Help > Help topics** to see the new online version of help.

GeoViewer main window

To start GeoViewer, double-click the desktop icon or click **Start** and choose **Programs > LizardTech > GeoViewer > GeoViewer**.



A: Menu bar **B:** Overview pane **C:** Navigation bar **D:** Project pane **E:** Map pane **F:** Status bar

The Menu bar

The **Menu** bar gives you quick access to most tasks and settings.

MENU	DESCRIPTION
File	Add raster and vector layers to the map, add layers from a server, add an OpenStreetMap base layer, and load or save projects.
Layer	Perform tasks on highlighted layers in the Project pane. For example, you can remove layers, hide layers, view layer metadata, and change the appearance of layers with Layer Controls . To highlight a layer, click the name of the layer in the Project pane.
Navigation	Navigate the map by panning, zooming, and more. If you have a LiDAR point cloud visible in the Map pane, you can load the points again on the map with the Refresh Points menu item.
Tools	Access tools for measuring distances and areas, exporting and printing images, and changing the projection of the map.
Options	You can set preferences for changing the map projection when a new layer is added, and you can set display preferences, including vector display options, dynamic range options, and line color options. You can enter a GeoViewer Pro license code, or if you have already entered a license, you can view the license code.
Help	Display the GeoViewer help, view information about the GeoViewer product, and access Extensis support for the product.

The Overview pane

The **Overview** pane is a navigation aid that displays the current view of the **Map** pane with reference to the rest of the map.

The **Overview** pane displays a fixed overview of all the layers added to the map. It also displays a navigation rectangle that matches the current view on the **Map** pane. You can click and drag the navigation rectangle to change the view on the **Map** pane.

TIP: You can change the color and width of the navigation rectangle in the **UI Preferences**.

The Navigation bar

Use the **Navigation** bar to navigate the **Map** pane.

ICON	NAME	DESCRIPTION
	Home	Restores the original view.
	Pan	Click and drag the map to change the location of the current view.
	Zoom in	Click to zoom in on the current view or click and drag to zoom in on an area of interest.
	Zoom out	Click to zoom out.
	Smooth zoom	Click and drag to zoom in and out. You can also scroll with the mouse to zoom in and out.
	Orbit focal point	3-D mode only. Moves your viewpoint in an orbit around your focal point.
	Refresh points	3-D mode only. Freshly displays a configurable number of points that fall within the current view.
	Measure	Measure the distances between points. With GeoViewer Pro, you can also measure areas.
	Select area	Draw an area of interest. You can save the area as a bookmark, export the area, or print the area.
	Tips and tricks	Display one of the GeoViewer tips.

The **Navigation** bar includes a **Zoom** slider that you can use to change the zoom level quickly.



TIP: If you resize the GeoViewer window, some of the tools may disappear from the toolbar. Click the drop-down arrow on the right to access the hidden buttons.



The Project pane

The **Project** pane displays a list of the layers added to the map. Use the **Project** pane to hide layers, to change layer order, and more. To save the layers displayed in the **Project** pane, choose **File > Save project**.

By default, the layers that you add to the **Project** pane are organized in a group. You can right-click in the **Project** pane to add groups and add layers. Each layer and group in the **Project** pane includes a check box that you can deselect to hide the layer or group.

You can also click on the name of a layer to highlight the layer on the map. Use the **Layer** menu to display layer options for highlighted layers, or right-click on the name of a layer and choose an option from the shortcut menu:

- **Remove selected**
- **Remove all**
- **Hide/show selected**
- **View layer metadata**
- **Layer controls**
- **Zoom to layer**

To highlight multiple layers, hold down the **CTRL** key and click on the name of each layer. For example, you may want to highlight multiple layers to zoom to an area on the map that fits both layers.

TIP: You can also hold **CTRL** and click on a layer in the **Map** pane to highlight the layer in the **Project** pane.

The Map pane

The **Map** pane displays an interactive map that you can use to view layers. Use the **Navigation** bar to change the view of the **Map** pane. For example, you can pan, zoom, and restore the original view.

The **Map** pane includes a search box that you can use to search for locations. You can search for locations using geographic coordinates like latitude and longitude or MGRS coordinates.

The **Map** pane also includes tabs at the bottom that you can use to switch between 2-D and 3-D mode. The 3-D mode is only available when you have added a LiDAR point cloud to the map.

NOTE: To use 3-D mode, you must have DirectX 9.0 installed. DirectX is included in the GeoViewer installer and is installed by default.

The Status bar

The **Status** bar displays the projection of the map, the current position of the mouse pointer, and whether GeoViewer is working to render the map.

WGS 84 / Pseudo-Mercator: 5942979.00000, -13681980.0000	Lat/Long: 47.000000, -122.900000	Idle	⋮
---	----------------------------------	------	---

Viewing layers

To view an image, add the image, or layer, to GeoViewer. A layer is any raster, vector, or LiDAR image that you display in GeoViewer.

A list of the layers that you add to GeoViewer appears in the **Project** pane. Use the **Project** pane to remove layers, hide layers, view layer metadata, and more. The layers that you add to GeoViewer also appear in the **Map** pane. Use the **Navigation** bar to navigate the **Map** pane. For more information, see *The Navigation bar* on page 11.

NOTE: Changes that you make to layers in the **Project** pane affect the way that layers are displayed in the **Map** pane and vice versa. For example, if you remove a layer from the **Project** pane, the layer disappears from the **Map** pane.

If you add a LiDAR layer to GeoViewer, you can also change the view mode to display the layer in 3-D.

Adding layers

Use the **File** menu to add layers to GeoViewer. You can add layers that are stored on your computer or network, called local layers, or you can add layers from an Express Server, WMS server, or JPIP server. You can also add an OpenStreetMap layer as a base map.

When you add a layer to a blank map in GeoViewer, you are prompted to select a projection system for the map. By default, you can select the native projection of the layer, WGS 84, or Web Mercator. If you upgrade to GeoViewer Pro, you can select from additional supported projection systems. See *Upgrading to GeoViewer Pro* on page 8.

When you add a layer to a map that already contains layers, you may be prompted to reproject the layer to the map's projection. For more information on projection systems, and to change the projection system of the map, see *Projection systems* on page 31.

To view a list of supported file formats that you can view in GeoViewer, see *Supported file formats* on page 15.

Adding local layers

Layers that are stored on your computer or network are called local layers.

To add a local layer to GeoViewer:

1. Choose **File > Add local layer**.
You can also right-click in the **Project** pane and choose **Add layer > Local layer** from the shortcut menu.
2. Navigate to the location of the layer.
If you do not see the name of the layer that you want to add, click the file format drop-down in the lower right corner and select **All files**.
3. Select one or more layers, and click **Open**.
To select multiple layers, hold down the **CTRL** key and click the layers that you want to add.

TIP: You can also drag layers from Windows Explorer to the **Project** pane. You can use any supported image type as a layer. See *Supported file formats* on page 15.

Adding Express Server layers

Connect to an Express Server to browse the layers on the server, then add the layers to GeoViewer.

To add an Express Server layer to GeoViewer:

1. Choose **File > Add Express Server layer**.
You can also right-click in the **Project** pane and choose **Add layer > Express Server layer** from the shortcut menu.
2. Enter the URL of the Express Server and click **Connect**.
The catalogs hosted on the Express Server appear in the **Catalogs** list.
3. Select a catalog to view the layers in the catalog.
4. Select a layer, and click **OK**.

NOTE: The **iserv-catalog-index** layer that you see in Express Server catalogs is a fast, indexed group of all the layers in the catalog. To select individual layers in a catalog, connect to the Express Server from the **Add WMS layer** interface.

Adding WMS layers

Connect to a WMS server to browse the layers on the server, then add the layers to GeoViewer.

To add a WMS layer to GeoViewer:

1. Choose **File > Add WMS layer**.
You can also right-click in the **Project** pane and select **Add layer > WMS layer** from the shortcut menu.
2. Enter the URL of the WMS server and click **Connect**.
The layers hosted on the WMS server appear in the **Server layers** list.
3. Click **>** to add a server layer to the list of selected layers. If a server layer has sub-layers, click **>>** to add all of the sub-layers to the list of selected layers.
4. Click **Up** or **Down** to move the selected layers within the list.

NOTE: When you add multiple layers at a time, the layers are displayed as a single layer in the **Project** pane and **Map** pane. To change the layer order after you add layers, remove the layers then add them again.

5. To remove a layer, click **X**.
6. Click **OK**.

Adding JPIP layers

To add a JPIP layer, enter the direct URL of the layer.

For example, you might enter the following JPIP URL:

http://demo.example.com:9013/JPIP/DC_Cropped.jp2

If the JPIP layer is hosted on an Express Server, you can enter the URL of the Express Server to browse JPIP layers. For more information, see **Adding Express Server layers** above.

Supported file formats

GeoViewer can display a broad range of file formats for raster, vector, and LiDAR layers.

The following table lists the file formats supported by GeoViewer:

FILE FORMAT	FILE EXTENSION	NOTES
CADRG	.toc is the most common	
ECW	.ecw	Earth Resource Mapping's Enhanced Compression Wavelet format.
ERDAS IMAGINE	.img	
ERDAS LAN	.lan	In 4-band LAN images, bands 2, 3, and 4 are interpreted as Red, Green, and Blue, respectively.
ESRI Shape files	.shp	
JPEG	.jpg, .jpeg	Requires a world file for georeferencing.
JPEG 2000	.jp2	
LAS	.las	This is a binary, uncompressed LiDAR point cloud format. GeoViewer supports LAS versions 1.0–1.3, with experimental support for LAS 1.4.
LASZip (LAZ)	.laz	This is a ZIP-compressed LAS file. GeoExpress supports LAZ files that are ZIPped versions of any supported LAS file.
MrSID	.sid	MrSID Generation 2 raster, Gen 3 raster, and Gen 4 raster and LiDAR
NITF 2.0, 2.1.	.ntf	Only supports uncompressed, JPEG compressed, and JP2 compressed data.
PNG	.png	Requires a world file for georeferencing.
Raw (uncompressed) BBB files (BIL, BIP, and BSQ)	.bbb, .bil, .bip, .bsq	
Sun Raster	.ras	
TIFF	.tif	
USGS DOQ	.doq, .nes, .ses, .sws, .nws	Both the old and new USGS DOQ formats are supported.
Windows BMP	.bmp	Requires a world file for georeferencing.

NOTES

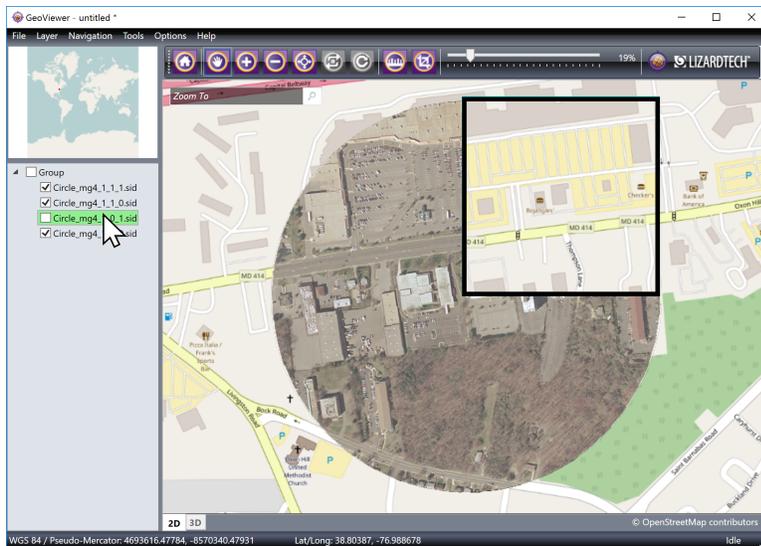
- All of the supported file formats can use world files for georeferencing, with the exception of file formats for LiDAR layers. However, GeoViewer does not read world files by default. To allow GeoViewer to read world files, choose **Options > Georeferencing Preferences**.
- If an **aux.xml** file exists for an image, the **aux.xml** file is used for georeferencing automatically. The projection information from **aux.xml** files takes precedence over image metadata and over world files as well.

Hiding and showing layers

When you clear the check box next to the name of a layer in the **Project** pane, the layer is hidden from the **Map** pane. For example, you may want to hide layers when you compare overlapping images. To show a layer again, select the check box next to the layer name in the **Project** pane.

To hide multiple layers at a time, hold down the **CTRL** key and click the names of the layers that you want to hide. Then, right-click one of the highlighted layers and chose **Hide/show selected** from the shortcut menu.

The following figure shows blank space on the **Map** pane where layers have been hidden:



Removing layers

Remove a layer to clear it from both the **Project** pane and the **Map** pane. To remove a layer, right-click the layer and choose **Remove selected** from the shortcut menu.

To remove multiple layers at a time, hold down the **CTRL** key and click the names of the layers that you want to remove. Then, right-click one of the highlighted layers and choose **Remove selected**.

To remove all layers, right-click in the **Project** pane and choose **Remove all**.

NOTE: Removing all layers from the **Project** pane does not clear the projection system of the map. To clear all layers and also clear the projection system of the map, choose **File > New project**.

Changing the layer order

For overlapping layers, the order in which you add layers to the map affects which layers display on top. To change the order of layers, click a layer in the **Project** pane and drag it up or down.

For example, to display a layer above all other layers in the **Map** pane, click the layer in the **Project** pane and drag it to the top of the layers list.

Viewing layer metadata

View layer metadata to view projection information for a layer, file information, and more.

To view metadata for a layer, right-click a layer in the **Project** pane and choose **View layer metadata** from the shortcut menu, or right-click a layer in the **Map** pane and choose **Layer > View layer metadata**.

To view the metadata for multiple layers at a time, hold down the **CTRL** key and click the names of the layers for which you want to view metadata. Then, right-click one of the highlighted layers and choose **View layer metadata**. The layer metadata is grouped by layer in the **Layer Metadata** dialog.

Organization of the Layer Metadata dialog

The **Layer Metadata** dialog is divided into two sides. The left side lists the layers that you selected and the metadata properties that you can view. The right side displays details for the item selected on the left.

Depending on the file format and the source of the layer you may view one or more of the following metadata properties for a layer:

- **Image properties:** width, height, number of bands, color space, sample type, bits per sample, format and compression ratios.
- **Vector properties:** number of shape layers, layer name, layer feature count and format.
- **LiDAR properties:** format; number of points; min, max, scale and offset; and supported fields.
- **Geographic properties:** left, top, right and bottom coordinates; x and y resolution; CRS name; and well-known text string (WKT).
- **File properties:** full layer path, size, creation time, modification time, attributes, and owner.
- **Express Server properties:** root URL; server, layer name and catalog; spatially indexed (true or false).
- **WMS properties:** root URL; GetCapabilities URL; server; layer name and title; CRS (may appear as SRS); format; and bounding box.
- **JPIP properties:** root URL; server, layer name and port.
- **Metadata tags:** basic metadata information, including file size, file name, encoding information, image tags, GeoTIFF tags, and more.
- **LAS properties:** ProjectID and generating software.

Viewing layers in 3-D mode

When you add a LiDAR point cloud to the map, you can view the layer in 3-D mode. To switch to 3-D mode, click the **3-D** tab at the bottom of the **Map** pane.

Once the map is in 3-D mode, you can access additional navigation buttons in the **Navigation** bar. Use **Orbit focal point** (🌀) to rotate the point cloud. Use **Refresh points** (🔄) to redraw the points visible in the **Map** pane. To render your points quickly, GeoViewer draws a representative sample of your points rather than drawing every single point. If you pan or zoom in, you may want to refresh points to draw more points in the area that you are viewing. To increase or decrease the default number of points that GeoViewer draws, see **User interface preferences** on page 35.

NOTE: To use 3-D mode, you must have DirectX 9.0 installed. DirectX is included in the GeoViewer installer and is installed by default.

Changing layer appearance

Change the appearance of raster layers in GeoViewer with the **Layer Controls** dialog. To access the **Layer Controls** dialog, right-click a layer in the **Project** pane and choose **Layer controls** from the shortcut menu.

Use the **Layer Controls** dialog to complete the following tasks:

- For local raster layers, you can select the bands that you want to view.
- For all raster layers, especially for 16-bit layers, you can select dynamic range options.
- For all raster layers that do not have an alpha band, you can specify a No Data value.

To change the appearance of multiple layers at a time, hold down the **CTRL** key and click the names of multiple layers. Then, right-click one of the highlighted layers and choose **Layer controls**.

If the layers are in a group, you can change the appearance of all the layers by right-clicking on the group.

TIP: To change the appearance of vector and LiDAR layers, and to change the background of the **Map** pane, see *User interface preferences* on page 35.

Selecting bands

Use the **Band Select** section of the **Layer Controls** dialog to specify the bands that you want to view. You can view an image in grayscale, or you can select three bands as the red, green, and blue bands.

By default, for multispectral images that have more than three bands, the first three bands are mapped to red, green, and blue. Use the drop-down menus to change the band order. Layers that have fewer than three bands are displayed in grayscale.

NOTE:

Band selection is not available in the following cases:

- Multiple layers have been selected and some of the layers have a different number of bands.
- The layer is a CMYK image.
- The layer is not stored on your computer or network.

Setting dynamic range

In the **Layer Controls** dialog, you can set dynamic range values for images that benefit from dynamic range stretching.

Layers that do not use their full dynamic range have a tendency to display as black because all of the pixel values are clustered on one end of the possible range of values. To improve the appearance of a layer that does not use its full dynamic range, GeoViewer approximates the dynamic range of the layer from the layer's pixel values. Then, GeoViewer distributes the image's pixel values into an 8-bit color space for viewing.

You can select the method that GeoViewer uses to approximate the dynamic range values:

- **Off:** GeoViewer does not calculate the dynamic range or apply dynamic range stretching.
- **Min Max:** GeoViewer uses the minimum and maximum values from the image metadata and applies dynamic range stretching. If the metadata does not contain minimum and maximum values, then the values are approximated from a statistical sample.
- **Std Dev:** GeoViewer calculates a set number of standard deviations from a statistical sample of the image and applies dynamic range stretching.
By default, the number of standard deviations used is 3; you can change this in the **Dynamic range** section of the **UI Preferences** dialog.
- **Manual:** GeoViewer uses the minimum and maximum values that you enter to apply dynamic range stretching. You can use the slider under the dynamic range histogram to manually adjust the minimum and maximum values.

NOTE: By default, dynamic range stretching is only applied to 16-bit images. To set the default method for calculating dynamic range, set **Dynamic range** preferences. For more information, see *User interface preferences* on page 35.

Setting the No Data value

The No Data value is the pixel value that you want to use for transparency. For example, if you have an image of a county, the parts of the image that are outside the county may display as black. To display the black portions of the image as transparent, you can set the No Data value to zero.

NOTE: For images with an alpha band, you do not need to set a No Data value because the transparent regions of the image are stored in the alpha band.

The following list describes the No Data values that you can select:

- **Set to minimum value:** For most images, the minimum value is 0, which corresponds to black.
- **Set to maximum value:** For 8-bit images, the maximum value is 255. For 16-bit images, the maximum value is 65535. The maximum value corresponds to white.
- **Use native layer transparency:** Read the image metadata for transparency information.
- **Manual:** Enter a No Data value for each band.

Fuzzy No Data

For compressed images without an alpha band, you can use GeoViewer's Fuzzy No Data feature to improve the appearance of transparent image regions.

A compressed image may contain slightly altered pixel values to further reduce the size of the image. As a result, when you set the no data value, you may notice that some portions of the image that should be transparent still appear. To correct this problem, the fuzzy no data feature expands the no data value to a small range of values which includes most of the slightly altered pixels.

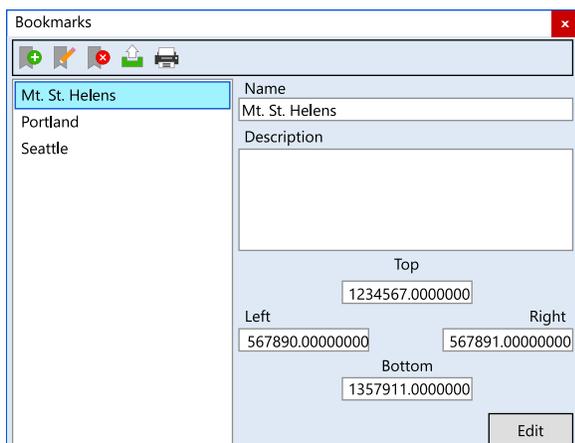
Fuzzy No Data is on by default. To turn off Fuzzy No Data, choose **Options > UI preferences**, then click the **Viewer** tab and deselect **Fuzzy no-data**.

Bookmarks

A bookmark is an area of interest that you want to save for later. For example, you may want to create bookmarks for areas that you access frequently.

Any time that you select an area of interest, the **Bookmarks** dialog appears and a temporary bookmark is created. You can export and print bookmarks, including temporary bookmarks, from the **Bookmarks** dialog. For more information on export and printing, see **Tools** on page 23.

To access the **Bookmarks** dialog without selecting an area of interest, choose **Navigation > Bookmarks**. The **Bookmarks** dialog includes a toolbar at the top, a list of saved bookmarks on the left, and details for the selected bookmark on the right. When you click a saved bookmark, the **Map** pane pans to the location of the bookmark.



TIP: Add the OpenStreetMap base layer to ensure that you can always pan to the location of your bookmarks. If you click on a bookmark whose location is not included in any of the layers on the map, GeoViewer displays a warning.

Creating bookmarks

You can create bookmarks from the **Bookmarks** dialog or any time that you select an area of interest.

To create a bookmark:

1. Pan the map to the location of the area of interest.
2. Choose **Navigation > Bookmarks**.
3. Click **Create Bookmark** .

A sample area of interest is drawn for you on the **Map** pane.

4. Use the points on the area of interest rectangle to drag or resize the bookmark.

TIP: You can also enter coordinates for the bookmark extents in the **Bookmarks** dialog.

5. Enter a name and description for the bookmark.
6. Click **Save**.

If you have added a name for the bookmark and selected an area within the bounds of the loaded layers, the bookmark is added to the list of bookmarks in the left pane of the **Bookmarks** dialog.

TIP: Click **Select area**  on the **Navigation** bar to manually draw an area of interest.

Deleting bookmarks

Delete one or more bookmarks at a time from the **Bookmarks** dialog.

To delete a bookmark:

1. Choose **Navigation > Bookmarks**.
2. Select an existing bookmark from the left pane of the **Bookmarks** dialog.
To delete multiple bookmarks, hold down the **CTRL** key and click on the names of multiple bookmarks.
3. Click **Delete Bookmark** .

Editing bookmarks

When you edit a bookmark, you can change the name, description, or area of interest of the bookmark.

To edit a bookmark:

1. Choose **Navigation > Bookmarks**.
2. Select an existing bookmark from the left pane of the **Bookmarks** dialog.
3. Click **Edit Bookmark** .
4. Edit the name and description of the bookmark in the text fields.
5. Use the points on the area of interest rectangle to drag or resize the bookmark.
You can manually change the bookmark extents in the text fields.
6. Click **Save**.

Tools

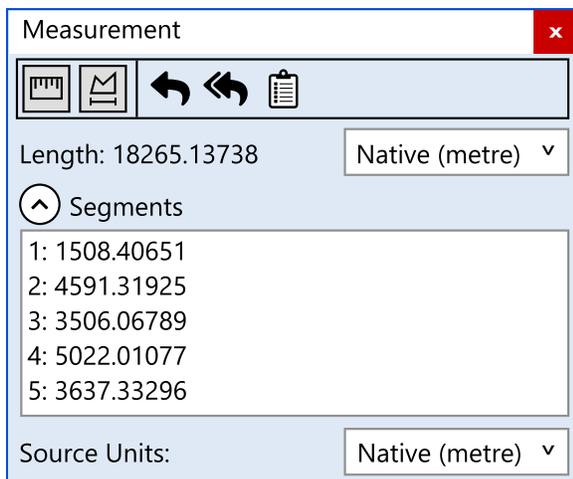
Click the **Tools** menu to access **Measure**, **Print**, and **Export** tools. You can only use GeoViewer tools when the **Map** pane is in 2-D mode.

The **Tools** menu also includes the **Change map projection** tool. For more information about changing the projection, see *Changing the projection system* on page 31.

The Measure tool

Use the **Measure** tool to measure the distance of line segments that you draw on the map. If you upgrade to GeoViewer Pro, you can also measure areas. See *Upgrading to GeoViewer Pro* on page 8.

Choose **Tools > Measure** to open the **Measurement** dialog, or click **Measure**  on the **Navigation** bar.



The **Measurement** dialog includes a toolbar at the top that you can use to switch between measuring distances and areas, to remove points, and to copy the measured distance or area to a clipboard. The **Measurement** dialog also includes a drop-down for selecting the measurement units, a list of line segments lengths, and a drop-down for selecting the source units.

By default, the measurement units match the map units, also known as the source units. The source units are read from the map's projection, so if the map projection has not been set, then the source units drop-down is unavailable. If the map does not have a projection system, then you can specify the source units from the drop-down.

Measuring distances and areas

Access the **Measurement** dialog to measure distances and areas. You can switch between distance measurement and area measurement without redrawing line segments.

To measure distances and areas:

1. Choose **Tools > Measure**.

You can also click **Measure**  on the **Navigation** bar or right-click in the **Map** pane and choose **Measure** from the shortcut menu.

2. Click in the **Map** pane to create points.

GeoViewer draws line segments between the points that you create. To display the length of the line segments, click the arrow next to **Segments**.

3. Double-click to create the final point and stop measuring.

4. To move a point, drag the point to another position.

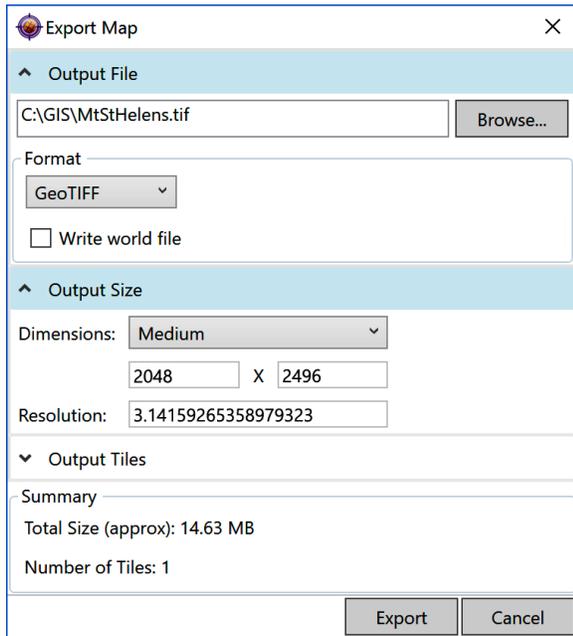
5. To delete a point, hold down the **CTRL** key and click the point.

6. Click  **Copy** in the **Measurement** dialog to copy the length of the line segments and the measured length or area.

The Export tool

Use the **Export** tool to create an image from the layers that you have added to GeoViewer. You can export any layers that you add to GeoViewer except for the OpenStreetMap layer. For LiDAR data, you can only export the rasterized version of the point cloud that you see in 2-D mode.

When you export an image in GeoViewer, you must select the area that you want to export. Choose **Tools > Export** to view the areas that you can select.



Use the **Export** dialog to specify the **Output File**, **Output Size**, and **Output Tiles**. You can only create image tiles if you upgrade to GeoViewer Pro. See *Upgrading to GeoViewer Pro* on page 8.

NOTE: The **Export** tool always creates 8-bit, unsigned, RGB images. If you attempt to export multispectral imagery, the **Export** tool only exports the three bands that are currently selected. For more information on selecting bands, see *Selecting bands* on page 18.

Exporting the map

To export the full extents of all the layers that are currently visible on the map:

1. Choose **Tools > Export > Map**.
2. Click **Browse**.
3. Navigate to the directory where you want to save the exported image.
4. Enter a name for the image and click **Save**.
5. Select the format that you want to use for the export image.
If you select PNG or JPEG, you can change the default compression and quality settings.
6. Click the **Output Size** tab and select one of the image dimensions from the drop-down.
7. If you have upgraded to GeoViewer Pro, then you can click the **Output Tiles** tab to export the map to several image tiles.
See *Upgrading to GeoViewer Pro* on page 8.
8. Review the export summary to ensure that the approximate size and number of tiles are correct.
9. Click **Export**.

Exporting the current view

Export only the area that is displayed in the **Map** pane.

To export the map:

1. Choose **Tools > Export > Current view**.
2. Click **Browse**.
3. Navigate to the directory where you want to save the exported image.
4. Enter a name for the image and click **Save**.
5. Select the format that you want to use for the export image.
If you select PNG or JPEG, you can change the default compression and quality settings.
6. Click the **Output Size** tab and select one of the image dimensions from the drop-down.
7. If you have upgraded to GeoViewer Pro, then you can click the **Output Tiles** tab to export the map to several image tiles.
See *Upgrading to GeoViewer Pro* on page 8.
8. Review the export summary to ensure that the approximate size and number of tiles are correct.
9. Click **Export**.

Exporting the selected area

To export an area that you draw in the **Map** pane:

1. Choose **Tools > Export > Selected area**, or click **Select area**  on the **Navigation** bar.
2. Click and drag to draw an area of interest in the **Map** pane.
The area is displayed as a temporary bookmark in the **Bookmarks** dialog so that you can make adjustments.
3. Click the points of the area of interest rectangle to drag or resize the area that you want to export. You can also manually enter the extents that you want to export in the text fields.
4. Click **Export Bookmark** .
5. Click **Browse**.
6. Navigate to the directory where you want to save the exported image.
7. Enter a name for the image and click **Save**.
8. Select the format that you want to use for the export image.
If you select PNG or JPEG, you can change the default compression and quality settings.
9. Click the **Output Size** tab and select one of the image dimensions from the drop-down.
10. If you have upgraded to GeoViewer Pro, then you can click the **Output Tiles** tab to export the map to several image tiles.
See *Upgrading to GeoViewer Pro* on page 8.
11. Review the export summary to ensure that the approximate size and number of tiles are correct.
12. Click **Export**.

Exporting a bookmarked region

To export a bookmarked region:

1. Choose **Tools > Export > Bookmarked region**.
2. Select an existing bookmark in the left pane.
3. Click **Export Bookmark** .
4. Click **Browse**.
5. Navigate to the directory where you want to save the exported image.
6. Enter a name for the image and click **Save**.
7. Select the format that you want to use for the export image.
If you select PNG or JPEG, you can change the default compression and quality settings.
8. Click the **Output Size** tab and select one of the image dimensions from the drop-down.
9. If you have upgraded to GeoViewer Pro, then you can click the **Output Tiles** tab to export the map to several image tiles.
See *Upgrading to GeoViewer Pro* on page 8.
10. Review the export summary to ensure that the approximate size and number of tiles are correct.
11. Click **Export**.

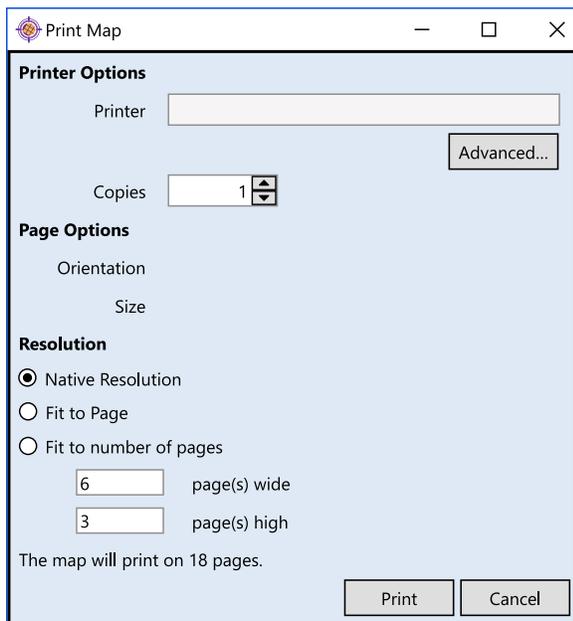
The Print tool

TIP: Printing is available for GeoViewer Pro users only. See *Upgrading to GeoViewer Pro* on page 8.

Use the **Print** tool to print the layers that you have added to GeoViewer. You can print any layers that you add to GeoViewer except for the OpenStreetMap layer. For LiDAR data, you can only print the rasterized version of the point cloud that you see in 2-D mode.

When you print an image in GeoViewer, you must select the area that you want to print. Choose **Tools > Print** to view the areas that you can select.

NOTE: If you attempt to print multispectral imagery, the **Print** tool only prints the three bands that are currently selected. For more information on selecting bands, see *Selecting bands* on page 18.



Use the **Print** dialog to specify **Printer Options**, **Page Options**, and **Resolution**.

NOTE: The quality of the print job depends on the printer that you use. GeoViewer always maps pixels to DPI to create the highest quality print possible. For example, if you print on a page that is eight inches wide and printer has a DPI of 600, then GeoViewer prints an image that is 4800 (8×600) pixels wide.

Printing the map

Print the full extents of all the layers that are currently visible on the map.

To print the map:

1. Choose **Tools > Print > Map**.
2. Select a printer from the list of available printers.
You can click **Advanced** to view printer-specific properties like two-sided printing.
3. Enter the number of copies that you want to print.
4. Select the page orientation and size.
5. Select the print resolution.

IMPORTANT: If you select **Native Resolution**, the print job may use a large number of pages. Review the number of pages needed for the print job at the bottom of the dialog.

6. Click **Print**.

Printing the current view

To print only the area that is displayed in the **Map** pane:

1. Choose **Tools > Print > Current view**.
2. Select a printer from the list of available printers.
You can click **Advanced** to view printer-specific properties like two-sided printing.
3. Enter the number of copies that you want to print.
4. Select the page orientation and size.
5. Select the print resolution.

IMPORTANT: If you select **Native Resolution**, the print job may use a large number of pages. Review the number of pages needed for the print job at the bottom of the dialog.

6. Click **Print**.

Printing the selected area

To print an area that you draw in the **Map** pane:

1. Choose **Tools > Print > Selected area**, or click **Select area**  on the **Navigation** bar.
2. Click and drag to draw an area of interest in the **Map** pane.
The area is displayed as a temporary bookmark in the **Bookmarks** dialog so that you can make adjustments.
3. Click the points of the area of interest rectangle to drag or resize the area that you want to print.
You can also manually enter the extents that you want to print in the text fields.
4. Click **Print Bookmark** .
5. Select a printer from the list of available printers.
You can click **Advanced** to view printer-specific properties like two-sided printing.
6. Enter the number of copies that you want to print.
7. Select the page orientation and size.
8. Select the print resolution.

IMPORTANT: If you select **Native Resolution**, the print job may use a large number of pages. Review the number of pages needed for the print job at the bottom of the dialog.

9. Click **Print**.

Printing a bookmarked region

To print a bookmarked region:

1. Choose **Tools > Print > Bookmarked region**.
2. Select an existing bookmark in the left pane.
3. Click **Print Bookmark** .
4. Select a printer from the list of available printers.
You can click **Advanced** to view printer-specific properties like two-sided printing.
5. Enter the number of copies that you want to print.
6. Select the page orientation and size.
7. Select the print resolution.

IMPORTANT: If you select **Native Resolution**, the print job may use a large number of pages. Review the number of pages needed for the print job at the bottom of the dialog.

8. Click **Print**.

Projection systems

Projection systems define the location of layers in GeoViewer as well as how to compensate for the curvature of the earth. To display multiple layers at a time, GeoViewer must display all the layers in the same projection. The process of displaying a layer in another projection system is called reprojection.

When you add a layer to a blank map, you are prompted to select a projection system for the map. You can also change the projection system of the map after you have added layers. By default, you can display a layer in the native projection of the layer, in Web Mercator, and in WGS 84. If you upgrade to GeoViewer Pro, you can use additional supported projection systems. See *Upgrading to GeoViewer Pro* on page 8.

Selecting the projection system

When you add a layer to a blank map, GeoViewer prompts you to select the projection system that you want to use for the map. Any layers that you add after the initial layer are displayed in the projection system of the map.

The OpenStreetMap layer however, is an exception. The OpenStreetMap layer can only be displayed in the Web Mercator projection system. If you add the OpenStreetMap layer to an existing map, GeoViewer prompts you to change the projection of the map to Web Mercator.

By default, you can set the projection system of the map to the native projection of the initial layer, to WGS 84, or to Web Mercator. If you upgrade to GeoViewer Pro, you can also select additional supported projections. See *Upgrading to GeoViewer Pro* on page 8.

Changing the projection system

If you have already added layers to GeoViewer, you can reproject the layers by choosing **Tools > Change map projection**. **NOTE:** You cannot reproject LiDAR layers.

By default, you can change the projection system of the map to Web Mercator and WGS 84. If you upgrade to GeoViewer Pro, you can change the projection system to additional supported projection systems. See *Upgrading to GeoViewer Pro* on page 8.

NOTE: If one or more of the layers that you have added to the map is not compatible with the projection system that you select, GeoViewer prompts you to remove the layers or cancel the reprojection.

Issues with projection systems

You may encounter issues with incompatible projection systems and with layers that do not have a projection system.

Many projection systems, especially region-specific projection systems are not compatible. For example, you may not be able to change the map projection from WGS 84 to UTM Zone 10N. Any time that there is a problem with incompatible projections, GeoViewer prompts you to either change the projection of the map or remove the layers with incompatible projections. To change the prompt settings, see **Georeferencing preferences** on page 34.

If you add a layer to GeoViewer that does not have a projection system, the layer is added with arbitrary pixel coordinates. If you add more layers, the layers may be added on top of each other. To position an image using a world file, see **Georeferencing preferences** on page 34.

NOTE: If an **aux.xml** file exists for an image, the **aux.xml** file is used for georeferencing automatically. The projection information from **aux.xml** files takes precedence over image metadata and over world files as well.

Projects

A project saves information about the layers that you have open in GeoViewer.

Every time that you run GeoViewer, a temporary project is created for you. You may want to save a project if you have many layers open, if you access the same layers frequently, or if you configured the layers to change their appearance. For each layer, GeoViewer stores the image bands that you selected, the dynamic range method that you selected, and the No Data value that you selected.

GeoViewer projects are saved with a **.gvp** file extension.

Creating a new project

A temporary project is created for you every time that you open GeoViewer. If you choose **File > New project**, GeoViewer clears all layers from the **Project** pane and also clears the projection system of the map.

TIP: If you remove all the layers from the **Project** pane, but do not create a new project, the map retains its projection system. You can view the projection system of the map in the **Status** bar.

Opening a project

To open a saved project file, Choose **File > Open project**. Only one GeoViewer project can be open at a time.

Saving a project

To save a project, choose **File > Save project**. To create a copy of an open project, you can choose **File > Save project as**.

If you make changes to a project, GeoViewer prompts you to save the project before closing. To turn off the prompt, select the **Don't ask me again** option the next time that you see the prompt. To turn the prompt on again, choose **Options > UI preferences** and click **Restore Defaults**.

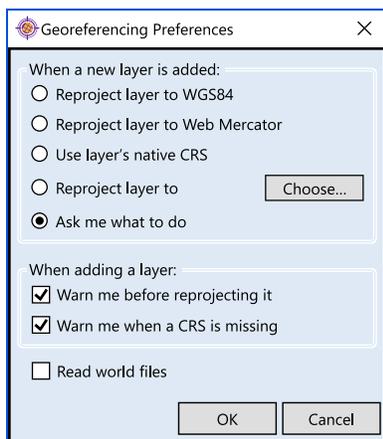
Preferences

Change the default georeferencing and user interface preferences from the **Options** menu.

To restore the default preferences, choose **Options > UI preferences** and click **Restore Defaults**. This also restores the default preferences for georeferencing.

Georeferencing preferences

Set georeferencing preferences to select the default projection system for the map, to configure warnings about reprojection, and to turn on support for reading world files. To set georeferencing preferences, choose **Options > Georeferencing preferences**.



Default projection preferences

By default, when you add a new layer to a blank map, GeoViewer prompts you to select a projection system. You can configure GeoViewer to automatically use WGS 84, Web Mercator, or the native projection of the layer. Additionally, if you upgrade to GeoViewer Pro you can choose from other projection systems. See **Upgrading to GeoViewer Pro** on page 8.

For more information on projection systems, see **Projection systems** on page 31.

Reprojection warning preferences

If you add a layer to GeoViewer that does not match the projection system of the map, GeoViewer warns you that the layer must be reprojected. To reproject layers automatically, clear the check box labeled **Warn me before reprojecting it**.

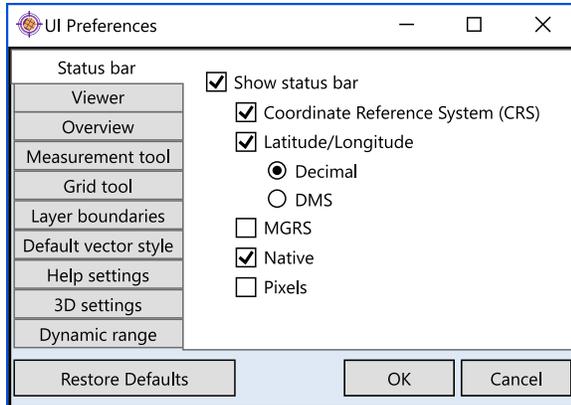
If you add a layer that does not have a projection to an existing map, GeoViewer warns you that the layer cannot be positioned correctly. If the existing map does not have a projection and the layer does have a projection, GeoViewer displays the same warning. To turn off this warning, clear the check box labeled **Warn me when a CRS is missing**. For more information about issues with reprojection, see **Issues with projection systems** on page 32.

World file preferences

By default, GeoViewer does not use information from world files to position layers on the map. To turn on world file support, select the check box labeled **Read world files**. If you turn on world files, information from world files takes precedence over information in a layer's metadata.

User interface preferences

Set user interface preferences to configure the status bar, to select colors for vector layers and other outlines, to change how point clouds are displayed, and more. To set user interface preferences, choose **Options > UI preferences**.



Status bar preferences

Select display preferences for the **Status** bar. To hide the **Status** bar, clear the **Show status bar** check box. Additionally, you can hide the coordinate reference system of the map and decide how to display the position of the mouse on the map.

Viewer preferences

Select the background color of the **Map** pane and turn **Fuzzy no-data** on or off. For more information see **Fuzzy No Data** on page 20.

Overview preferences

Change the color of the navigation rectangle in the **Overview** pane. For more information, see **The Overview pane** on page 11.

Measurement tool preferences

Change the color of the line segments and points that you create with the **Measure** tool.

Grid tool preferences

Change the color of grid lines during tiled image export.

Layer boundaries preferences

Display an outline around layers, change the color and width of the outline, and display the name of individual layers when you rest your mouse pointer on the layers.

Default vector style preferences

Change the color and width of vector layer lines.

Help settings

Display tips and tricks when GeoViewer starts. If you turn off tips and tricks, you can still access them from the **Help** menu or **Navigation** bar.

3-D settings

Change the display settings for LiDAR data that you can view in 3-D mode. You can change the following settings:

- Exaggerate the **Z** axis to make differences in elevation more noticeable.
- Change the number of points to display at a time. Increase the number of points to display more detail and avoid refreshing points frequently. Decrease the number of points to improve the rendering time.
- Change the color gradient to help you visualize changes in elevation.
- Enter a custom range for **Z** values.
- Display or hide the **X**, **Y**, and **Z** axes.
- Display or hide a bounding box that marks the extents of the point cloud.

Dynamic range preferences

Change the method that GeoViewer uses to calculate dynamic range values for stretching the dynamic range of 16-bit images. For more information, see ***Setting dynamic range*** on page 19.

Contacting Extensis

Extensis

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Portland, OR 97201

Web: <https://www.extensis.com/>

Extensis Europe

Suites 17 & 18, Newton House
Kings Park Road, Moulton Park
Northampton NN3 6LG, United Kingdom

Customer Support

Support Form: <https://help.extensis.com/hc/en-us/requests/new/>

Sales

Web: <https://www.extensis.com/contact-us-form/> (all regions)

We also work with resellers around the world; [find one near you](#).

Extensis: <https://www.extensis.com/>

Support Form: <https://help.extensis.com/hc/en-us/requests/new/>

Sales: <https://www.extensis.com/contact-us-form/>

Find A Reseller: <https://www.extensis.com/find-a-reseller/>

Support

Use these resources to get answers to questions you have about GeoViewer and other Extensis products.

GeoViewer

[GeoViewer 9 Support](#)

This page links to installers and uninstallers, PDF downloads, and other common support resources.

[GeoViewer Desktop System Requirements](#)

Full system requirements and other information about the current version of GeoViewer.

[GeoViewer Desktop Release Notes](#)

Historical release notes for all updates to the current major release of GeoViewer.

[GeoViewer Pro Knowledge Base](#)

Articles describing situational issues and solutions to user-reported problems with GeoViewer.

General resources

[Extensis Knowledge Base](#)

Search for articles about any current Extensis product, and retired versions as well.

[Support Services](#)

Details about types of support and hours of availability, including our Support Policy.

Our Support Policy in a nutshell

Extensis provides full support for the current version of all shipping products. In addition, Extensis provides limited support for older products up to one year after the product version is no longer offered for sale.

[Extensis's Videos on Vimeo](#)

Hundreds of training sessions, events, and webinars. These are mostly in English, but there are some gems in French and German as well.

[Extensis Videos on YouTube](#)

Training, event, and educational videos.

GeoViewer 9 Support: <https://www.extensis.com/support/geoviewer-9/>

GeoViewer Desktop System Requirements: <https://www.extensis.com/support/geoviewer-9/system-requirements/>

GeoViewer Desktop Release Notes: <https://www.extensis.com/support/geoviewer-9/release-notes/>

GeoViewer Pro Knowledge Base: <https://help.extensis.com/hc/en-us/sections/360001683113>

Extensis Knowledge Base: <https://help.extensis.com/hc/en-us/>

Support Services: <https://www.extensis.com/support/support-policy/>

Extensis's Videos on Vimeo: <https://vimeo.com/extensis/videos/>

Extensis Videos on YouTube: <https://www.youtube.com/user/extensisblog>

[Support Form](#)

Use this form to submit a support case.

Provide as much of the following information as you can:

- Your email address;
- As the Subject, a brief description of the problem you are having;
- A more detailed description of the problem: when it occurs, whether you can reproduce it, whether it has caused you to lose data, and any other details to help our staff track down the issue.
- Your company name or account number;
- The type of support you need (generally you'll choose **Fix an Issue/Technical Support**);
- The product you're using;
- The version of the product (generally this is in the product's **About** box);
- Your operating system;
- Any creative application that might also be affected.

You can also attach a screen shot or other file related to your issue.

[Chat](#)

Click  **Chat** at the bottom right of any page of the Extensis website. (Chat is only available between 8:00AM and 3:00PM Pacific time, Monday through Friday.)

[Learn and Support](#)

Links to white papers, testimonials, blog posts, and other resources.

Legal resources

Extensis EULA on page 40

The legalese description of your rights while using GeoViewer and any associated services.

[Privacy Policy](#)

Details about information we collect and how we use it, including information specific to Europe and California.

[Privacy Shield Policy](#)

Details about our practices regarding personal information transmitted to us from organizations subject to protection laws in the European Economic Area and Switzerland.

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Extensis EULA

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January 2019

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