

LizardTech®

GeoViewer 5

User Manual

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Chapter 1: Introduction

Thank you for using LizardTech® GeoViewer 5. We're confident that you will find GeoViewer to be everything you need to view and export maps employing high resolution images and image mosaics. Whether you're viewing imagery on your computer's hard drive, on a WMS or JPIP server, or in a LizardTech Express Server® catalog, GeoViewer makes rapid viewing of large images possible while maintaining maximum image quality.

GeoViewer now supports importing files of the MrSID® Generation 4 (MG4) format as layers. MG4 support means you can specify any three bands of a multispectral file to view as the red, green and blue bands, or any single band to view as the grey band. The "Select bands" dialog can be reached by right-clicking a layer's name in the project pane (see "Selecting Bands" on page 24).

The purpose of this user manual is to give you quick information about how to use GeoViewer to view image, vector and LiDAR data. To access this documentation as WebHelp within the application, select **Help Topics** from the **Help** menu.

If you have not yet installed GeoViewer or need to update the application, see "Chapter 2: Installing or Updating GeoViewer" on page 3. For a quick visual overview of the user interface, see "Chapter 3: Getting Oriented in GeoViewer" on page 7. The most common navigational tasks are covered in "Chapter 4: Viewing Maps and Layers" starting on page 15. Saving projects and other procedures are covered in other chapters.

System Requirements

The following system is recommended for installing and running GeoViewer:

- One of the following operating systems:
 - Microsoft Windows XP, 32-bit, Service Pack 3
 - Microsoft Windows XP, 64-bit, Service Pack 2
 - Microsoft Windows Windows Server 2003, Service Pack 2
 - Microsoft Windows Vista, Service Pack 1
 - Microsoft Windows 7
- Microsoft .NET Framework 4.0 (included)
- Microsoft DirectX 9.0c
- 1-GHz processor
- 2 gigabytes (GB) RAM

NOTE: In order to use GeoViewer's 3D viewing tab, your system must be running Microsoft DirectX 9.0c. You must visit Microsoft's website (<http://msdn.microsoft.com/en-us/directx/aa937788.aspx>) to download DirectX. You can still use GeoViewer's 2D viewing tab without DirectX.

GeoViewer comes in both 32-bit and 64-bit versions. Yes, you may run the 32-bit version on a 64-bit system if you wish.

A Note about Terminology

If you are familiar with GeoExpress and other LizardTech products designed specifically and exclusively for work with raster images and mosaics, you're probably used to calling things added to

project lists "images" or "mosaics", or even "tiles".

Because LizardTech GeoViewer is designed for viewing and exporting GIS layers that may include other kinds of data besides raster imagery (such as vector and LiDAR data), this vocabulary no longer covers all the possibilities. GeoViewer therefore introduces some new terminology.

Map – What you see in the large main window is called a "map". A map is the total of all raster and vector images and LiDAR data added together. That large window is called the Map pane. Even if all you're doing is viewing a mosaicked raster image with no vector or LiDAR data, GeoViewer still considers you to be viewing a map.

Layer – The images and other data that you add to the map are called "layers". Whether you want to import an image, a single tile of a mosaic, a LiDAR file, or a vector overlay, you import it as a layer. Layers can be displayed or hidden.

NOTE: When a project consists of a single layer, that layer is identical to the map.

The GeoViewer user interface exclusively employs the "map and layer" terminology. The GeoViewer help materials may use both "layer" and "image" depending on context.

Now, off you go. We hope that this little chat will have made it easier for you to get started using GeoViewer.

Chapter 2: Installing or Updating GeoViewer

GeoViewer uses an easy installation mechanism. Simply go to LizardTech's downloads page and select your operating system to download and install the latest version of GeoViewer.

NOTE: Administrative privileges are not required to install GeoViewer, but they are required to install any prerequisite software, such as Microsoft .NET Framework.

To install or update GeoViewer:

1. Point your browser to:
<http://www.lizardtech.com/downloads/viewers.php>
2. Click **GeoViewer 5**.
3. Click **Windows - 32 bit** or **Windows - 64 bit** under GeoViewer 5.
4. Read the license agreement and click **I Agree** to begin installation.

The installation process automatically checks your computer to make sure your version of Windows has the prerequisite software (**Note:** DirectX is an exception. You must download DirectX from Microsoft's website).

If prerequisite software is missing and you have administrative privileges, you may be prompted for administrative credentials and the software is automatically downloaded and installed.

If you do not have administrative privileges, see your IT administrator for help downloading and installing the software.

Once all the prerequisite software is installed, the installation process installs and runs GeoViewer.

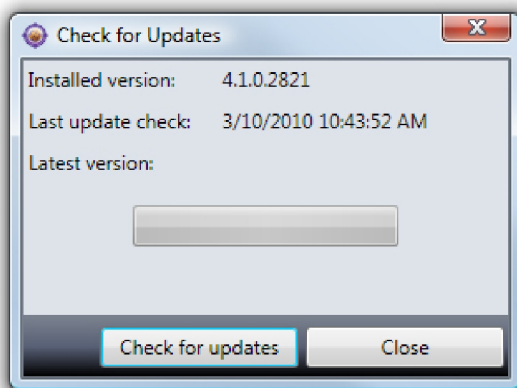
NOTE: When using Firefox to access the download page you may have to save the executable (setup.exe) and then run it locally.

Checking for Updates

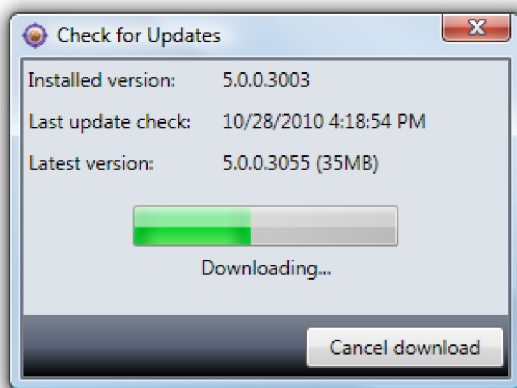
You can check for newer versions of GeoViewer anytime, or you can set GeoViewer to automatically remind you to check for updates. You can even specify how often it should prompt you. By default GeoViewer reminds you every 7 days to check for a new version.

To manually check for updates:

1. Choose **Check for updates** from the **Help** menu. The Check for Updates dialog appears as shown below with information about your current version and the date and time you last checked, and the latest version (**Note:** the Latest Version field is blank until you have checked for updates).



2. Click **Check for updates**. If a more recent version of GeoViewer is available it is listed as the "latest version" and the button changes to say "Download". If not, the button becomes unavailable.
3. Click **Download** if you wish to update GeoViewer. The new version is downloaded and installed, as shown below.



4. Close and restart GeoViewer.

After you restart, you will be running the new version of GeoViewer. You can confirm this by again choosing **Help > Check for updates**.

For information on setting automatic updates, see "Setting GeoViewer Update Preferences" on page 43.

Uninstalling GeoViewer

To uninstall GeoViewer:

1. Open your **Control Panel** and choose **Add/Remove Programs (Programs and Features on Vista)**. The Add/Remove Programs dialog (or equivalent Vista task pane) appears.
2. Choose an option and click **OK**.

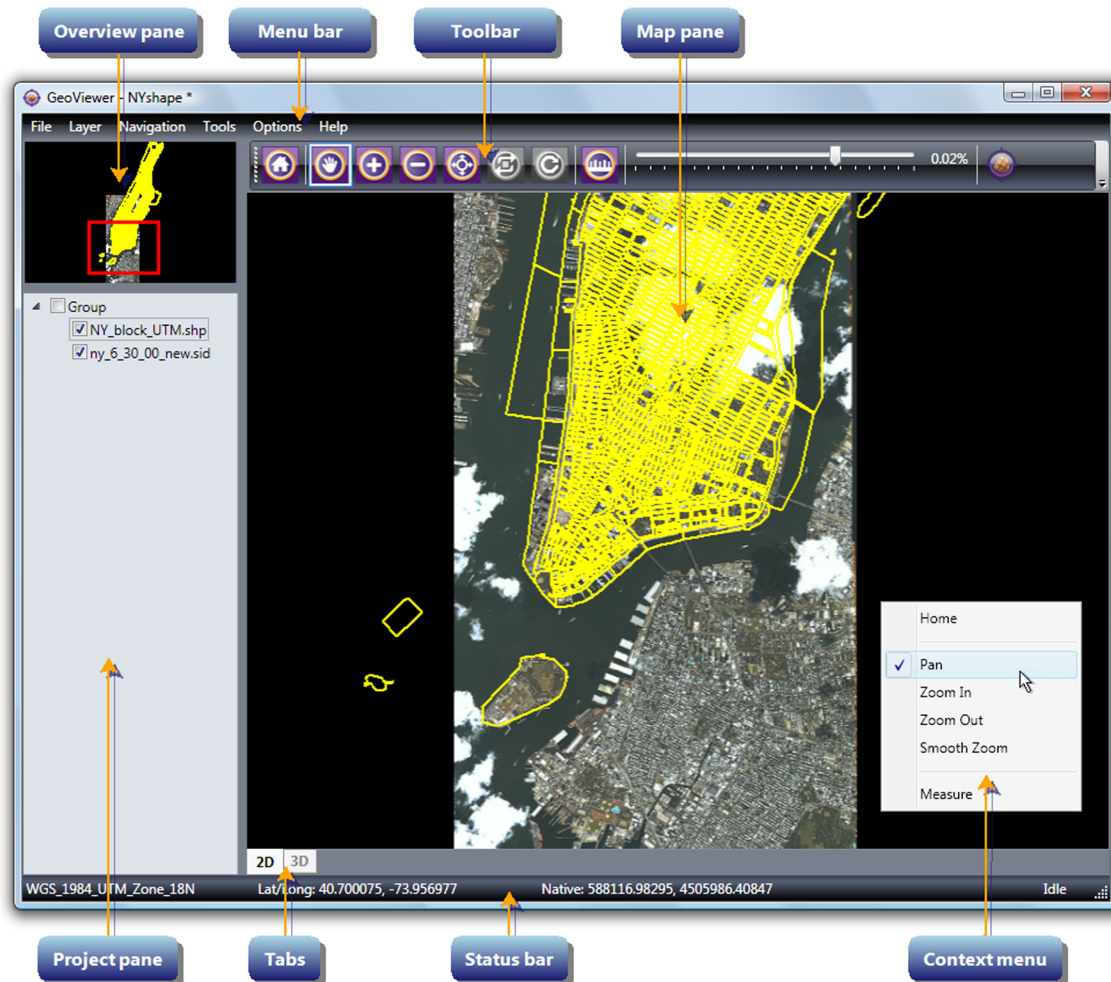
Restore the application to its previous state leaves the application installed but removes the most recent update. This option is only available if you have already installed a previous version.

Remove the application from this computer completely removes the application.

Chapter 3: Getting Oriented in GeoViewer

GeoViewer's user interface is shown in the illustration below with its basic components labeled. Brief descriptions of these components are given further below. They are discussed in more detail on their respective pages.

GeoViewer's User Interface



The Overview Pane

The Overview pane occupies the upper left corner of the user interface. It displays a fixed overview of the map (see "A Note about Terminology" on page 1). At zoomed-in views, a navigation rectangle inside the Overview pane delineates the region that is in view in the Map pane.

As you pan the image in the Map pane, the navigation rectangle moves in the Overview pane to reflect the panning motion, so that the rectangle always represents the current Map pane view. You can use the Overview pane to pan; simply move the navigation rectangle (click and hold, then drag) to recenter the view showing in the Map pane.

By default, the navigation rectangle is red and has a width of three pixels. You can change these attributes in your UI preferences (see "Setting User Interface Preferences" on page 41).

For more information, see "Chapter 4: Viewing Maps and Layers" on page 15.

The Menu Bar

The Menu bar offers commands and options on six menus and their submenus, as described in the table below.

The Menu Bar

Menu	Item or Submenu	Description
File	Add layer	<p>Local layer... – Enables you to specify or browse directories for one or more images, mosaic tiles, or vector or LiDAR files.</p> <p>Express Server Layer... – Enables you to specify and connect to an Express Server, browse catalogs, and choose imagery.</p> <p>WMS layer... – Enables you to specify and connect to a WMS server, select layers, and specify format and EPSG code.</p> <p>JPIP layer... – Enables you to specify a WMS server and select an image for viewing via the JPIP protocol.</p>
	Add group...	Creates a folder in the Project pane for grouping layers. You can name each layer group as it is created.
	Recent layers	Enables you to browse for recently opened layers. Unavailable ("grayed out") until after first layer is added.
	Load project...	Enables you to specify or browse directories for an existing project.
	Recent projects	Enables you to browse for recently opened projects. Unavailable until after first project is saved.
	Close project	Closes the current project and opens a new, untitled one.
	Save project	Saves changes you have made to the current project.
	Save project as...	Enables you to specify a name and location for saving a project.
	Exit	Quits the GeoViewer application.
Layer	Remove selected	Removes a layer or layers from the Project pane.

Menu	Item or Submenu	Description
	Remove all	Removes all groups and layers.
	Hide/show selected	Makes layers appear in or disappear from Map pane.
	Rename...	Enables you to rename a group or layer.
	View layer metadata	Displays metadata about selected layers.
	Set layer transparency...	Enables you to specify which color should be transparent for a layer.
	Vector settings...	Enables you to specify width and color for vector lines for a layer.
Navigation	Home	Restores original view.
	Pan	Sets cursor to panning mode.
	Zoom In	Sets cursor to zoom in mode.
	Zoom Out	Sets cursor to zoom out mode.
	Smooth Zoom	Sets cursor to Smooth Zoom mode.
	Orbit focal point	(3D mode only) Moves your viewpoint in an orbit around your focal point. Disabled in 2D viewing.
	Refresh points	(3D mode only) Freshly displays a configurable number of points that fall within the current view. Disabled in 2D viewing.
	Zoom to layer(s)	Zooms to selected layer(s).
Tools	Measure	(2D mode only) Sets cursor to Measure mode and displays the Measurement pane.
	Clear measurements	(2D mode only) Removes measurement lines and clears all reported segment lengths.
	View layer metadata	Displays metadata about selected layers.
	Export	Export current view... – (2D mode only) Creates a file of exactly what you see in the Map pane, including vector overlays. Export map... – (2D mode only) Creates a file showing the region covered by all layers, regardless of whether those layers are hidden or shown.
Options	Georeferencing preferences	Enables you to choose warning options and specify how georeferencing information should be treated when layers are added to a map.

Menu	Item or Submenu	Description
	UI preferences	Enables you to set preferences for the GeoViewer user interface.
	AutoUpdate preferences	Enables you to specify whether and how often you want GeoViewer to check automatically for updated versions.
Help	Help topics	Opens GeoViewer WebHelp.
	Tips and tricks	Displays the Tips and Tricks dialog.
	GeoViewer support	Links to http://www.lizardtech.com/support/geoviewer
	Check for updates...	Enables you to check for and download the latest version of GeoViewer.
	System information	Provides details pertaining to your installation of GeoViewer.
	About GeoViewer	Displays version number and copyright information.

The Toolbar

The GeoViewer toolbar is located above the Map pane and offers tool buttons identified by the following icons:

Toolbar icons



Home

Restores the original view, centered and scaled for best fit (see "Restoring Original View" on page 23). In 3D viewing, repositions your viewpoint to its original position zoomed out along your z axis.



Pan

Enables you to move the view in any direction within the layer (see "Panning" on page 18). In 3D viewing, "moves" the data from side to side or up and down.



Zoom In

The Zoom In tool can be used to click in to a selected area by increments or to define a precise region of the image to zoom in on (see "Using the Zoom In and Zoom Out Tools" on page 19).



Zoom Out

The Zoom Out tool is used to incrementally view a greater portion of the image than the current view, and incidentally to change the view's centerpoint (see "Using the Zoom In and Zoom Out Tools" on page 19).



Smooth Zoom

The Smooth Zoom tool enables you to zoom in or out in a continuous motion (see "Using the Smooth Zoom Tool" on page 20).





Orbit Focal Point

(3D mode only) Moves your viewpoint in an orbit around your focal point. Disabled in 2D viewing.



Refresh Points

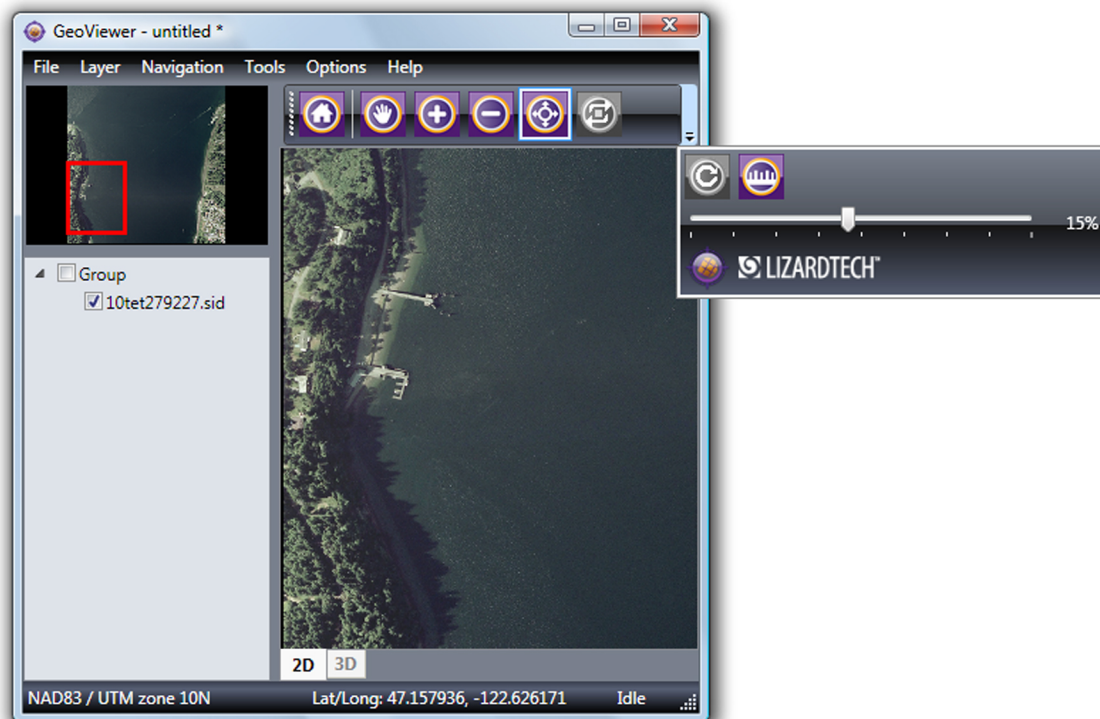
(3D mode only) Freshly displays a configurable number of points that fall within the current view. Disabled in 2D viewing.

- | | | |
|---|-----------------|---|
|  | Measure | The Measure tool enables you to measure distance between points (see "Chapter 7: Measuring Distance" on page 35). |
|  | Tips and Tricks | Clicking the GeoViewer logo on the toolbar displays the Tips and Tricks dialog (see "Displaying Tips and Tricks" on page 47). |

The toolbar also offers a Zoom slider, shown below, for zooming in or out by increments (see "Using the Slider Bar" on page 19).



TIP: If you resize your main window to smaller dimensions, some of the tools may disappear from the toolbar, starting on the right. These tools can still be quickly accessed using the More Buttons drop-down. In the illustration below, several buttons and the Zoom slider have been removed to the More Buttons drop-down.



The Map Pane

The Map pane is the large pane occupying the right side of the user interface. This is where you view detail in maps and layers and mark points for measurement.

The Map pane displays the map at the zoom level you select and centered according to whatever panning movements you perform.

As you navigate within the map (zoom in, pan, etc.), the view in the Map pane changes accordingly.

The Map pane has two tabs, one for two-dimensional (2D) viewing and one for three-dimensional (3D) viewing. Select the tabs at the bottom left corner of the Map pane.

For more information, see "Chapter 4: Viewing Maps and Layers" on page 15.

The Project Pane

When you open a layer (see "A Note about Terminology" on page 1) a temporary project file is created, even if you only view a single layer and then close it. The Project pane enables you to add layers to your map and turn each layer on or off for creating and exporting different views. For more information see "Chapter 6: Working with Projects" on page 29.

The Status Bar

Located at the bottom of the user interface, the status bar reports the map's coordinate reference system, whether GeoViewer is idle or working, and the position of your cursor as it moves across the Map pane (2D mode) or the x and y coordinates of your focal point (3D mode). Cursor position is reported in any or all of the following georeferencing modes.

- Latitude/Longitude
- MGRS - (Military Grid Referencing System)
- Native - (the CRS of your map, determined when the first layer was added)
- Pixels

By default, GeoViewer reports positions in Latitude/Longitude and Native. You can change this and other status bar options in your UI preferences (see "Setting User Interface Preferences" on page 41).

Context Menus

A context menu (sometimes called a "right-click" or "pop-up" menu) offers quick access to common actions relevant to a particular pane.

GeoViewer has two context menus, the Map and the Project context menus.

The Map context menu provides quick access to common navigational commands and to the Measure tool.

The Project context menu provides quick access to common commands relating to layers.

To access the Map context menu, right click anywhere in the Map pane.

To access the Project context menu, right click any layer, or any selected group of layers, listed in the Project pane.

The individual commands and options displayed on the context menus are described in appropriate sections elsewhere in this help. Some commands may be unavailable ("grayed out"), depending on what is selected when you access a context menu.

The Map context menu is shown in the illustration of the user interface (see "GeoViewer's User Interface" on page 7).

Chapter 4: Viewing Maps and Layers

This chapter covers adding images or "layers" (see "A Note about Terminology" on page 1) to your project, using basic navigational tools to maneuver around them, and view their metadata.

Adding a Layer to View

Images are treated as layers in GeoViewer, so when you want to view an image you must add it to the project as a layer. You may open layers, including Shapefiles and LiDAR data, from a local repository, from Express Server catalogs, or from WMS or JPIP servers. For a list of supported input formats, see "Supported File Formats" on page 45.

You may need to reconcile coordinate reference system (CRS) information among layers when adding them to the project. For more information see "Reconciling Projections Among Layers" on page 27.

NOTE: The first layer to be loaded determines the CRS for the map. If you want to display your layers in a different CRS, you must create a new map. For more information see "Chapter 5: Working with Coordinate Reference Systems" on page 27.

Opening a Local Layer

To open a local layer do one of the following:

- Enter **Ctrl+O** and browse folders for the desired file.
- Choose **Add layer** from the **File** menu, then choose **Local layer** and browse folders for the desired file.
- Drag a file from Windows Explorer and drop it into the Project pane.
- Right-click in the Project pane to access the Project context menu, then choose **Add layer**, then choose **Local layer** and browse folders for the desired file.

NOTE: Selecting large numbers of layers to add using the Windows Open dialog sometimes results in an error referencing "bad" or "truncated" file names. If this happens, select the files and drag them into the Project pane.

Opening an Express Server Layer

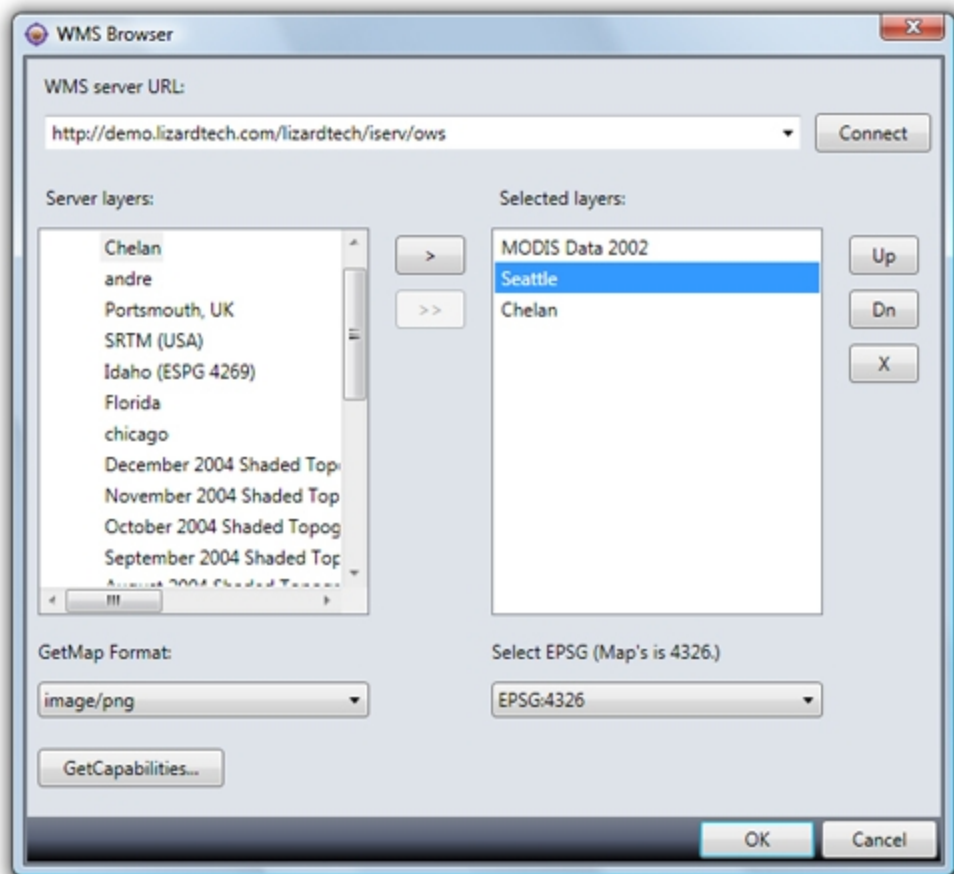
To open an Express Server layer:

1. Choose **Add Layer** from the **File** menu, then choose **Express Server layer**. (Alternatively, right-click in the Project pane and choose **Add layer > Express Server layer**.) The Express Server URL dialog box appears.
2. Enter a URL and click **Connect**. The Catalogs list at left becomes populated.
3. Select a catalog to see its contents in the Layers list at right.
4. Select a layer and click **OK**. The layers you selected are opened and their names are added to the Project pane.

Opening a Layer on a WMS Server

To open a WMS layer:

1. Choose **Add layer** from the **File** menu, then choose **WMS layer**. (Alternatively, right-click in the Project pane and choose **Add layer > WMS layer**.) The WMS Browser appears as shown below.

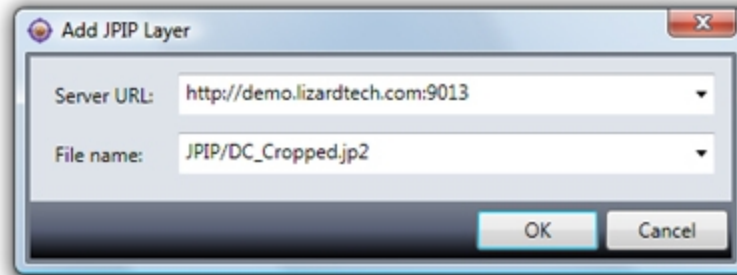


2. Enter a WMS server URL and click **Connect**. The Server Layers list at left becomes populated. An arrow next to an item indicates that it contains one or more secondary layers.
3. Click **>** to select a layer or **>>** to select all immediate secondary layers.
4. Use the **Up**, **Dn** and **X** buttons to arrange or delete selected layers. The ordering of the layers determines which layer is displayed on top when the server mosaics them for delivery.
5. Click **OK**. The layers you selected are opened as a single layer from the server and their names are combined as a single layer name in the Project pane.

Opening a Layer on a JPIP Server

To open a JPIP layer:

1. Choose **Add layer** from the **File** menu, then choose **JPIP layer**. (Alternatively, right-click in the Project pane and choose **Add layer > JPIP layer**.) The JPIP Layer Selector appears.
2. Enter a server URL, port and source file name as shown below. Note the location of the port number.



3. Click **OK**. The layers you selected are opened and their names are added to the Project pane.

When you add a layer to GeoViewer's Project pane, the view in the Map pane automatically updates to display that data. For LiDAR data, this means that the points are refreshed upon each added layer.

NOTE: GeoViewer does not support georeferencing in JPIP layers.

Hiding and Showing Layers

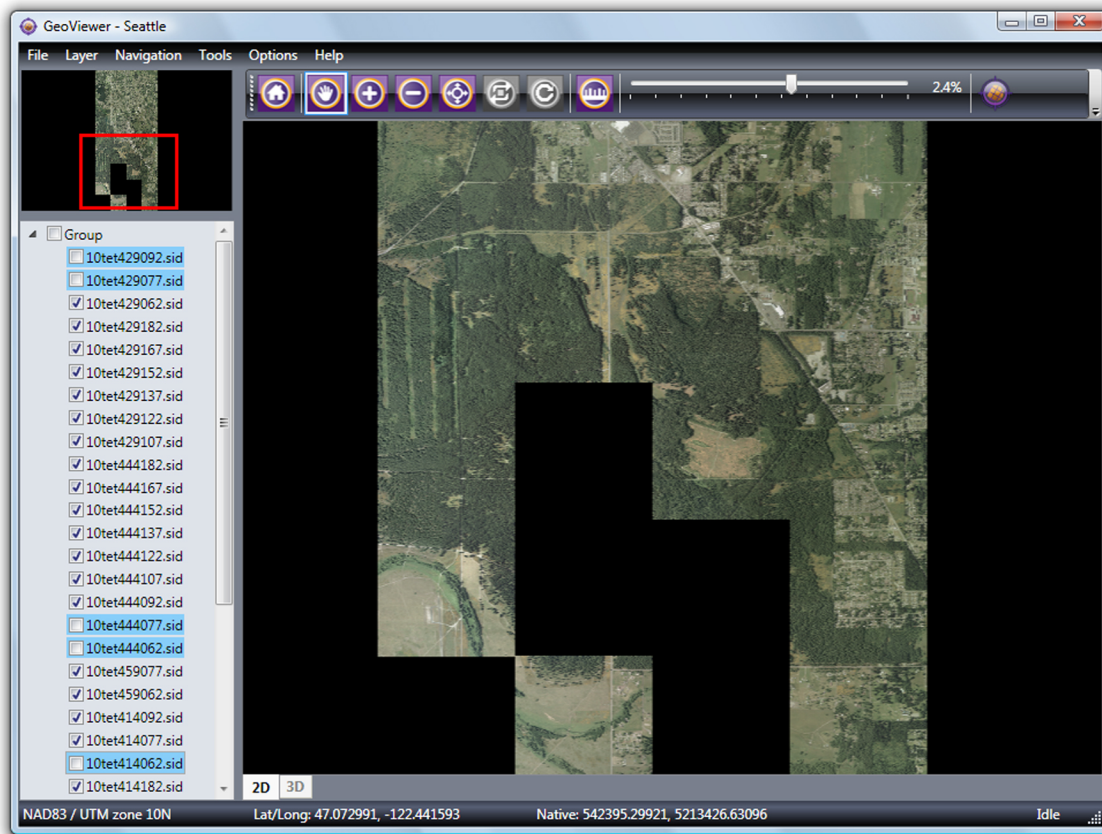
By default, layers opened in GeoViewer are displayed in the Map pane, but you can choose not to display any layer by hiding it on the Project pane. For example, you may wish to view just one tile of a mosaic. By hiding the layers representing the other tiles, you can pan and zoom more efficiently in the layer you're interested in. Hiding and showing layers is different from selecting and deselecting them (for more information see "Selecting and Deselecting Layers" on page 24).

To hide a layer, clear the checkbox next to its name in the Project pane.

To show a layer again, select the checkbox next to its name in the Project pane.

TIP: To hide or show multiple layers at once, select them in the Project pane, then right-click anywhere in the selection and choose **Hide/show layers** from the context menu.

In the illustration below a project has been opened that contains a number of mosaicked image tiles. Each tile is treated as a layer; however, several layers have been hidden (their checkboxes have been cleared), which means that these layers are not currently displayed in the Map pane.



When you hide a layer it disappears from the Map pane. Each of the remaining layers is displayed correctly as to its position in relation to all the other layers, whether the other layers are visible or not.

Panning

There are two methods for panning a layer in two dimensions or "2D" (for information about panning in 3D, see "Navigating in Three Dimensions" on page 21):

- "Quick panning" using the Overview pane for bringing the region of the map of most interest to you quickly into the Map pane.
- Using the Pan tool for fine tuning the view

To "quick pan" a layer, click and drag in the Overview pane to move the navigation rectangle until it encompasses the region you wish to view.

TIP: Quick panning is most useful after you have zoomed in a level or two. In the original ("home") view the navigation rectangle is not visible until you pan or zoom. Similarly, the navigation rectangle is not visible at views zoomed out beyond home view.

To pan a layer using the Pan tool:

1. Click the **Pan** icon on the toolbar (alternatively, choose **Pan** from the **Navigation** menu or from the Map context menu).
2. Click and drag on the layer in the Map pane. This brings areas outside the pane into view. The navigation rectangle in the Overview pane (see "The Overview Pane" on page 7) shows you what portion of the layer the Map pane is displaying.

Zooming In and Out

There are many methods for zooming into and out of a layer or map:

- Zoom in by defining an area with the Zoom In tool
- Zoom in or out by increments using the Zoom In or Zoom Out tool
- Zoom in or out by increments using the slider bar
- Zoom in or out using the scroll wheel
- Zoom to specific layer(s) using the Project context menu
- Zoom in or out using the Smooth Zoom tool
- Zoom out using the Home button

For information specific to zooming in or out in 3D, see "Navigating in Three Dimensions" on page 21.

Using the Zoom In and Zoom Out Tools

To define a zoom area with the Zoom In tool:

1. Click the **Zoom In** icon on the toolbar (alternatively, choose **Zoom In** from the Map context menu). The cursor changes to indicate that you are using the Zoom In tool.
2. Click and drag with the cursor to draw a rectangle on the map. The view refreshes and the area you defined is displayed to best fit in the Map pane.

To zoom in or out by increments using the Zoom In or Zoom Out tool:

1. Click the **Zoom In** or **Zoom Out** icon on the toolbar (alternatively, choose **Zoom In** or **Zoom Out** from the Map context menu).
2. Click on the map where you wish the zoomed-in or zoomed-out view to be centered. Click again until you arrive at the desired zoom level. The navigation rectangle in the Overview pane shows you what portion of the image the Map pane is displaying.

Using the Slider Bar

To zoom in or out by increments using the slider bar, do one of the following:

- Click and drag the knob on the slider bar above the Map pane
- Click on the slider bar anywhere to the left or right of the knob

Using the Scroll Wheel

If your mouse has a scroll wheel, you can zoom in and out simply by rolling the wheel back and forth. The advantage of this method is that you do not have to be in Zoom In or Zoom Out mode to do this.

You can zoom back and forth when another tool is selected, for example while you are panning or measuring.

Using 'Zoom to Layer'

To zoom to specific layer(s) using the context menu:

1. Right-click a single layer name in the Project pane, or select several layer names in the Project pane and right-click anywhere in that selection. The Project context menu appears.
2. Choose **Zoom to layer(s)**. The layer or layers you selected are displayed at best fit in the Map pane.

Using the Smooth Zoom Tool

Using the Smooth Zoom tool gives you fine control over the view.

To zoom in or out using the Smooth Zoom tool:

1. Click the **Smooth Zoom** icon on the toolbar.
2. Click in the Map pane and drag downward to zoom in or upward to zoom out.

NOTE: In quick zooming the centerpoint of the view remains constant. If you are using the Smooth Zoom tool and wish to pan left or right, you must click out of Smooth Zoom mode and into Pan mode using the Pan tool.

3D Viewing

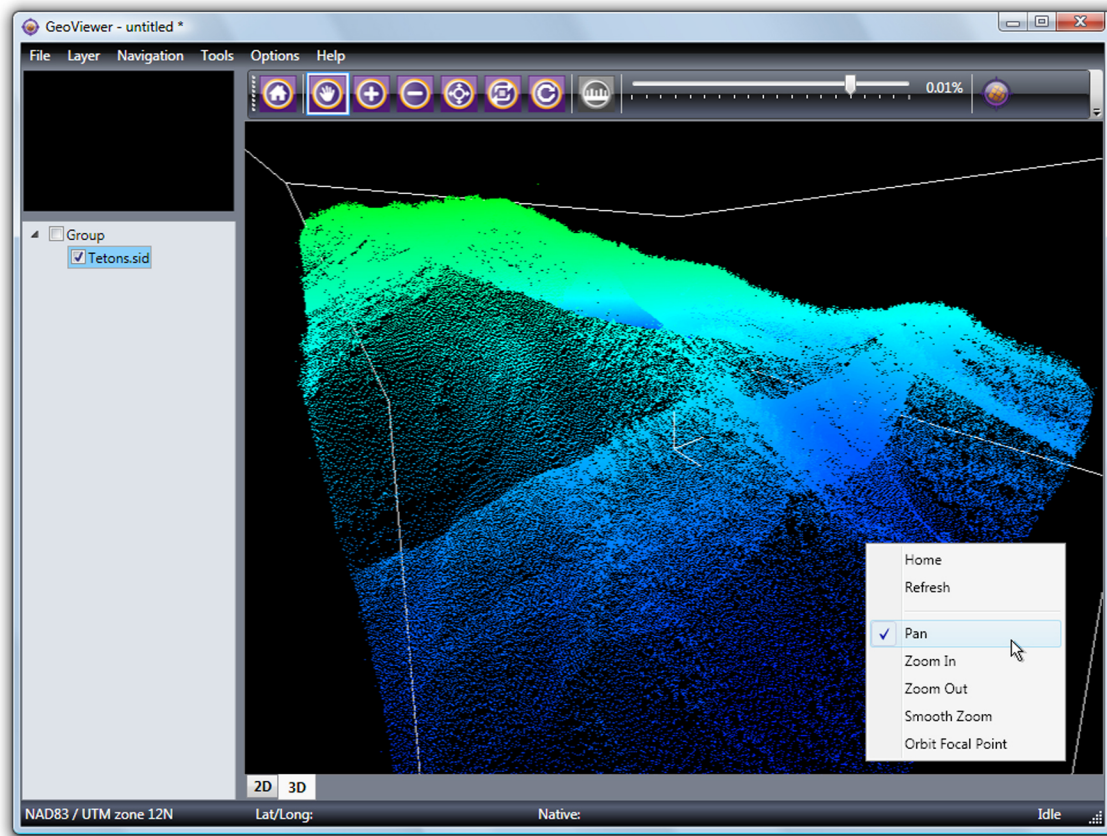
Using the 3D viewing mode enables you to orbit, pan and zoom your LiDAR layers in three dimensions. The 3D tab becomes available when you add a LiDAR file to the Project pane. Supported LiDAR input formats are LAS and MrSID Generation 4 (MG4).

The illustration below shows GeoViewer with the 3D tab selected. Notice that the Orbit Focal Point and Refresh Points buttons are available on the toolbar. These options are also added to the Map context menu.

When you first view a layer on the 3D tab your viewpoint is positioned at the "top" of your z axis, and the Map pane shows only the region that was visible on the 2D tab. Thus, if you zoom in on the 2D tab before clicking the 3D tab, only points for the region that was showing on the 2D tab are displayed on the 3D tab.

The UI Preference dialog enables you to customize several aspects of 3D viewing, such as whether or not the focal point axes and the bounding box are shown, and to select a different color gradient (see "3D Viewing Preferences" on page 42).

NOTE: Layers that have no z data will not be displayed in 3D mode.



Navigating in Three Dimensions

Three dimensional viewing is complex and the tools you use to pan and zoom a flat 2D image may seem unintuitive when you're using them for 3D viewing. So let's take a closer look and establish a metaphor for what's really happening in 3D mode.

Imagine that when you view your data, you are looking at the center of a sphere. Let's call it the *orbital sphere*. The outer surface of the orbital sphere represents the infinite possible positions your viewpoint can occupy. Your *focal point* is always the center of an orbital sphere no matter how you navigate. When you first view your data on the 3D tab, that data is centered where the focal point is, but it is important to recognize that *the data and the focal point are not bound together*.

When you orbit the data, your viewpoint is essentially revolving around the focal point, and if you have not yet panned the data, your viewpoint is also revolving around the center of the body of data. Imagine your viewpoint swirling around on the surface of the orbital sphere like a camera on a spherical scaffold. Relative to the viewpoint, your data appears to turn and roll around according to your orbiting movements.

Panning the data is different in that the viewpoint does not move along the surface of the sphere, but up and down or sideways *on the plane tangential to the sphere*. This makes the entire body of data appear to move sideways or up or down, regardless of what angle you are viewing it from. What is actually happening is that your focal point is shifting as you pan, relative to the data, so that your viewpoint now rests on the surface of a new orbital sphere.

With all this in mind, we recommend that you simply take the navigation tools for a test drive. You will notice several things right away.

- Zooming in reduces the diameter of your orbital sphere. You can zoom in to the "space" occupied by the data points so far that you can then use the orbit tool to revolve in a very tight circle, so that the data appears to revolve behind you. In fact you are still orbiting the focal point, but at a much tighter radius.
- You cannot zoom in past your focal point. If your focal point is in the middle of the body of data, it may be "in the air" above a building or other item you wish to view, and you cannot zoom in any closer to the object behind it. In this case, you should zoom back out a little, orbit so that you can see the relationship of your target to your focal point (make sure axes are showing – (see "3D Viewing Preferences" on page 42) and then use the Pan tool to "move" the data so that your focal point is behind your target.
- If you pan far enough, it is possible to "move" your data so that it no longer lies in your orbital sphere at all.

In a very short time, you will develop patterns of panning, zooming and orbiting that best suit your workflow. To start out, you may want to pan a little, zoom a little, then orbit a little to explore the data, than repeat the process, panning again as necessary to place your focal point properly in relation to the data you wish to view more closely.

Focal Point

Your focal point is identified by three short axis markings that form what looks like a corner. They help you orient your viewpoint among the data. You may choose not to display the axes (see "3D Viewing Preferences" on page 42).

NOTE: The x and y coordinates of your focal point are displayed on the status bar.

Color Gradient

GeoViewer assigns a gradient color scheme to the point cloud, based on the minimums and maximums of the z values of the LiDAR layers that make up the map. These min and max z values of each LiDAR file are taken from the file itself, and in most cases this works fine. However, there are two cases in which this will lead to a seemingly incorrect rendering, such as the image appearing entirely as shades of blue.

1. If the points are not evenly distributed across the range from the map's minimum to maximum z values, the gradient coloring will appear incorrect. For example, a one million point LiDAR file may contain 999,999 points with a z range of 100 to 200 and one point with a z value of 10000 (due possibly to sensor error). In this case, all but one of the points will be classified at the lower end of the gradient.
2. Some LAS files are encoded with incorrect values for the bounding box of the point cloud. Usually as a result of earlier preprocessing workflows, a typical case would be to have the claimed z range much larger than the actual data's z range. (MrSID Generation 4 files do not have this problem, as the bounds encoded within the file are always "tight" to the actual data's bounding box.)

This behavior can be manually overridden (see "3D Viewing Preferences" on page 42).


NOTE: Minimum and maximum z values that you set manually are stored in your project file.

Navigating Using Keyboard Shortcuts

The following keyboard shortcuts make navigation in 3D mode a snap:

- While holding down the **Ctrl** key, click and drag up or down to zoom smoothly out or in.
- While holding down the **Shift** key, click and drag in any direction to rotate the view.
- While holding down both the **Ctrl** and **Shift** keys, click and drag to define the region you wish to zoom to.

Refreshing Points

The Map pane shows 500,000 points of data by default. You can change this number on the 3D settings tab of the UI Preferences dialog. When you first open your data in the Map pane, those points are distributed over the entire volume of the data. When you zoom in among the data points, shapes and contours may be harder to see and the data may appear "thinner". You can increase the density of points in your area of interest by clicking the Refresh Points button .

When you refresh the points, GeoViewer again displays 500,000 points, but all of the points displayed after the refresh command are located within your current view, which makes for greater density in the region you are inspecting.

TIP: Refreshing points is more effective if you are viewing perpendicular to the earth or other foundational surface in your data when you refresh. If your view tilts upward toward a "horizon", then a broader region will be included and the points will be distributed evenly throughout it. A good rule of thumb is to zoom in closely over your target while viewing perpendicular to the ground, then refresh your points, then orbit to explore the data.

Restoring Original View

Clicking the **Home** button on the toolbar restores a view of the entire map at its "best fit" in the Map pane. In 3D mode, this corresponds to a "top down" view of the data. Clicking the **Home** button also refreshes your points.

Customizing GeoViewer's Background Color

GeoViewer uses black as the viewer's default background color, but you can change this to any desired color.

To customize the background color:

1. Choose **UI preferences** from the **Options** menu.
2. Select the **Background color tab**.
3. Select the **Use custom background color** radio button, then click **Choose color**. The Select a Color dialog appears.

4. Specify a color using the slider, the number value fields, or the hexadecimal notation field, then click **OK** until all dialogs are closed.

Selecting and Deselecting Layers

Selecting and deselecting layers is different from hiding and showing them. Showing (or hiding) a layer simply means using its checkbox in the Project pane to make it appear in (or disappear from) the Map pane (for more information see "Hiding and Showing Layers" on page 17). Selecting layers reads them for a particular operation, such as removing them from the list or viewing their metadata.

You can select any layer in the Project pane whether it is hidden or shown.

To select a layer, click the layer's name.

TIP: Use the **Shift + Click** method to select multiple consecutive layers in the list. Use the **Ctrl + Click** to select multiple not-consecutive layers in the list or to deselect a layer from a group you have selected.

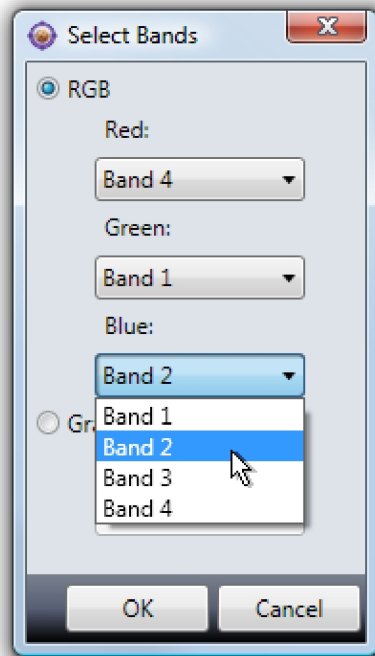
Once you have the desired layers selected, right click on any member of the selection to access the Project context menu for available operations (alternatively, choose from the commands on the menu bar).

Selecting Bands

GeoViewer enables you to specify any three bands of a multibanded or *multispectral* layer to view as the red, green and blue bands, or any single band to view as the grey band. By default, if a layer has three or more bands the first three will be mapped to red, green and blue and if there are less than three the first band will be displayed as the grey band.

To select bands from a multispectral layer:

1. Right click a layer or selection of layers in the Project pane and choose **Select bands** from the context menu. The Select Bands dialog appears as shown below.



2. Select bands from the drop-down menus for each of the three bands (or the grey band), then click **OK**.

NOTE: Band selection is disabled in the following cases:

- The selection is a CMYK or CMYK+alpha image or contains a CMYK or CMYK+alpha image.
- The selection includes both RGB images and RGB+alpha images.
- The selection includes images with different numbers of bands (for example a grayscale image and an RGB image).
- The selection in the Project pane includes a "group" label.

Viewing Layer Metadata

GeoViewer enables you to view the metadata of the layers loaded into the Project pane as well as basic image and file information.

To view metadata for a layer or layers:

1. In the Project pane, select one or more layer names. Layers do not have to be showing in the Map pane for you to view their metadata.
2. Right-click anywhere in the Project pane and choose **View layer metadata** from the context menu. The Layer Metadata pane appears.

TIP: When viewing metadata for a single layer, you may combine the steps above by right-clicking to select the name.

Organization of the Layer Metadata Pane

The Layer Metadata pane is divided into two sides. The left side is a navigation outline listing the names of any layers you selected and under each name several types of information. If any item of the outline is collapsed you may expand it by clicking the arrow next to it. Each layer is listed separately in the outline.

The right side displays the details for the item selected in the outline.

Under each layer name, information is listed that might include the following, depending on the file format and the source of the 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 for x, y and z; 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
 - Basic Metadata – original file size, input format, original file name, encoding SDK version, encoding modifications, image width and height, image colorspace, image data type, NODATA pixel value, transparent pixel value, geographic (x,y)-origin, x and y resolution, and well-known text string (WKT).
 - IMAGE tags – all IMAGE:: tags
 - GeoTIFF tags – all GEOTIFF_CHAR:: and GEOTIFF_NUM:: tags
 - All tags – combined list of GeoTIFF and IMAGE tags
- LAS properties – ProjectID and generating software.

Chapter 5: Working with Coordinate Reference Systems

In order to display georeferenced images in proper relation to one another, GeoViewer must put all layers into the same projection or *coordinate reference system* (CRS). Changing an image's CRS is called *reprojecting*.

Setting the CRS for a Map

When you add the first layer to your map, GeoViewer asks whether you want the layer to be added in its native CRS or be reprojected to WGS84. This first decision determines the CRS for the map. You must create a new map if you want to display your layers in a different CRS.

Reprojecting to WGS84 has the following advantages:

- WGS84 is the industry default
- WGS84 corresponds to latitude/longitude (lat/lon)
- WGS84 is easily converted to and from other projection systems
- GPS uses WGS84

If the first layer has no CRS, it is added to the map in "pixel space", that is, having a nongeographic CRS corresponding to image coordinates.

TIP: You can set your preferences so that GeoViewer always reprojects an image to WGS84 or always uses the native CRS (see "Setting Georeferencing Preferences" on page 41). This way, GeoViewer will not need to query you each time you add the first layer to a project.

Reconciling Projections Among Layers

The first layer to be loaded determines the coordinate reference system (CRS) for the map. Layers added after the first layer are put into the CRS you specified for the first layer, except in the following cases:

- **The subsequently added layer is in pixel space.** In this case, the layer's coordinates are treated as being in the same CRS as that of the map, when they may not be.
- **The subsequently added layer has no georeferencing.** In this case, the subsequently added layer is positioned in the map using any geocoordinates available, such as information in a world file.
- **The subsequently added layer is a LiDAR file.** In this case reprojection is not supported.

WARNING: Either of the first two cases above may result in undesirable positioning of that layer, so you should not import a nongeoreferenced layer unless you are fairly confident that you know what CRS it is projected in.

By default, you are notified whenever there is a potential mismatch in projections. If you wish, you can use your preference settings to have GeoViewer always handle these cases in specified ways (see "Setting Georeferencing Preferences" on page 41).

NOTE: Some reprojections, such as WGS84 to UTM, may yield errors or unusable results.

Chapter 6: Working with Projects

When you run GeoViewer, the application opens an untitled *project* for the layers you wish to view. Every layer you add automatically becomes part of the project. This temporary project is either saved as a project file or discarded when you close GeoViewer at the end of your viewing session.

Saved GeoViewer projects carry a “.gvp” extension.

Only one GeoViewer project can be open at a time.

Creating a New Project

New GeoViewer projects are automatically created in two ways:

- When you run GeoViewer, the application opens to an untitled project.
- When you choose **Close project** from the **File** menu, your current project, whether you save it or not, is replaced by a new untitled project.

Opening an Existing Project

To open an existing project:

1. Select **Load project** from the **File** menu. The Open dialog box appears.
2. Browse directories for the desired “.gvp” file and click **Open**.

Project Files Made with Earlier Versions of GeoViewer

If a project file made with GeoViewer 4.0.1 or earlier is opened in GeoViewer 5, it will be translated into memory so that you can use it but it will not automatically be saved upon closing.

To replace the older version of the project file, choose "Save project" from the "File" menu.

To save a new version of the project file and retain the original, choose "Save project as" from the "File" menu.

In either case, a new "version 5".gvp file is created, which can be opened, used and saved normally thereafter.

Organizing Layers

The Project pane gives you several ways to organize layers to your advantage. You can create new groups of layers, and you can drag layers around within a group or from one group to another.

Moving Layers

Layers are displayed in the Map pane in a kind of "stack" whose order (called the *Z order*) precisely follows that of the Project pane. Layers that are higher up in the list in the Project pane are displayed on top of other layers that share the same area. The top layer obscures those beneath it except where

there is transparency or "nodata" (see "Viewing and Setting Layer Transparency Values" on page 31).

You can move layers within a group or move a layer from one group to another.

To change the position of a layer in the Z order, click on its name and drag it up or down in the list.

TIP: To get the best map display, put your vector layers "above" your image layers in the Project pane. If you reverse them in the Z order your shapefile borders may be uncharitably rendered.

Grouping Layers

An initial group is created when you add your first layer.

Creating new layer groups enables you to organize your imagery. For example, you may group layers according to years or regions. By placing layers of the same year together in a group, you can hide or show that group with a single click to examine changes in annual increments (see "Hiding and Showing Layers" on page 17). Likewise, organizing by region groups enables you to quickly compare differences across locations.

Your workflow may suggest other groupings, such as by layer source, job, analyst, etc.

To create a new group:

1. Choose **Add group** from the **File** menu or from the Project context menu. The Add Group dialog appears.
2. Enter a name for your group and click **OK**.

NOTE: The presence of a group does not in itself affect the Z order. However, moving one group above or below another does affect position in the Z order of all the layers in the repositioned groups.

Renaming a Group or Layer

You may change the name of any group or layer.

To rename a group or layer:

1. Right-click the group or layer name in the Project pane and choose **Rename** from the context menu. The Rename Group or Rename Layer dialog appears.
2. Enter a new name for your group or layer and click **OK**.

Removing a Layer from a Project

You can either hide a layer so that it is not displayed in the Map pane or remove it from the project. If you are likely to want to view the layer again in the context of the current project, consider hiding it instead of removing it (for more information see "Hiding and Showing Layers" on page 17).

To remove a layer or layers from a project:

1. If more than one layer is to be removed, select the names of all layers to be removed on the Project pane.
2. Right click the layer name or selection of names and choose **Remove selected** from the context menu. Alternatively, choose **Remove selected** from the **Layer** menu.

To remove all the layers in a project, choose "Remove all" from the Project context menu or from the "Layer" menu.

NOTE: Removing all layers does not create a new project nor does it close the current one. The CRS established for the map is still in effect even though you have removed all layers.

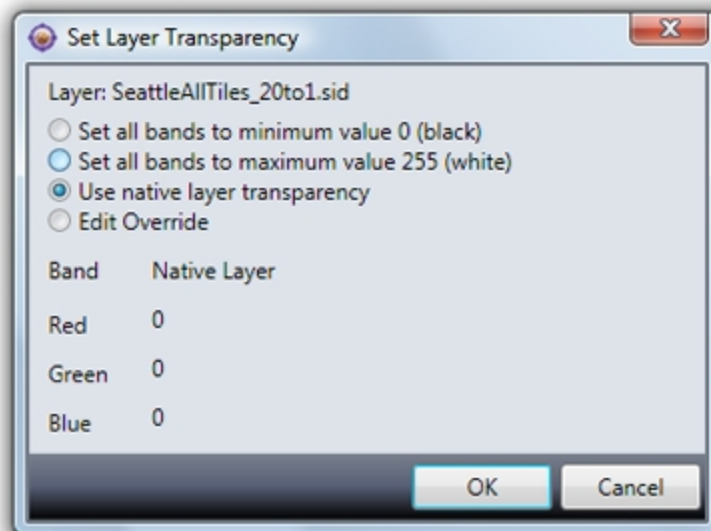
Viewing and Setting Layer Transparency Values

GeoViewer enables you to specify which color of a raster layer will be transparent. Setting the layer transparency or "nodata" values enables you to create mosaics of overlapping images.

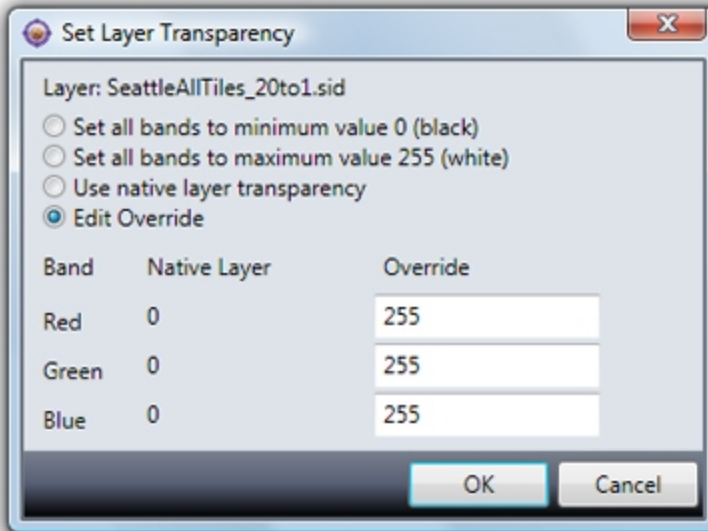
You may set all bands in the layer to black, white, the image's native transparency values, or any arbitrary set of values.

To view and set a layer's transparency values:

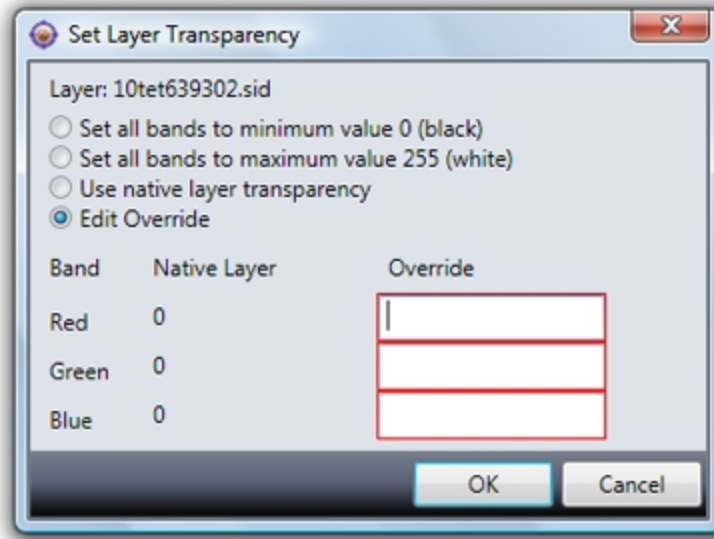
1. In the Project pane, right-click the appropriate layer's name and choose **Set layer transparency**. The Set Transparency dialog appears as shown below. By default, the layer's native values are displayed and used.



If native values have previously been overridden, the Edit Override radio button is selected and override fields appear to the right displaying the override values previously set, as shown below.



2. Click the radio button closest to your desired settings.
 - **Set all bands to minimum value** – Specifies that the layer's transparency color be black (all bands have values of 0). If they are not already visible, Override fields appear.
 - **Set all bands to maximum value** – Specifies that the layer's transparency color be white (all bands have the maximum transparency value – for an 8-bit RGB image this would be 255). If they are not already visible, Override fields appear.
 - **Use native layer transparency** – Specifies that the layer's native values be used.
 - **Edit Override** – Enables you to specify values for each band.
3. If you select **Edit Override**, the Override appear as shown below. If native values have previously been overridden, the override fields display the values previously set. Enter desired values.



4. Click **OK**.

NOTE: If you selected **Set all minimum** or **Set all maximum**, the **Edit Override** button will be selected the next time you access this dialog, but the fields will remain populated with minimum or maximum values until you change them.

Saving a Project

You may save a project at any time. You will be prompted to save any changes you wish to keep when you close GeoViewer.

Saved GeoViewer projects carry a “.gvp” extension.

To save a project:

1. Choose **Save project** or **Save project as** from the **File** menu. If you choose **Save project as**, the Save As dialog box appears.
2. Specify a name and a folder and click **Save**. A new GeoViewer project (“.gvp”) file is created.

For information on project files made with GeoViewer 4.0.1 or earlier, see “Project Files Made with Earlier Versions of GeoViewer” on page 29.

Chapter 7: Measuring Distance

In 2D mode GeoViewer enables you to measure the distance between two points or the total distance of several line segments drawn on a map with the Measuring tool. When you use the Measuring tool, the Measurement pane appears in the Map pane.

Besides showing you the distances among the points you measure, the Measurement pane indicates the *display unit* (the measurement unit your distances are to be reported in) and the *source unit* (the measurement unit the image was originally georeferenced in), and allows you to set the display units as you desire.

To use the Measuring Tool or access the Measurement pane do one of the following:

- Click the **Measure** icon on the toolbar.
- Choose **Measure** from the **Tools** menu.
- Right-click in the Map pane and choose **Measure** from the context menu.

Using the Measure Tool

Taking Measurements

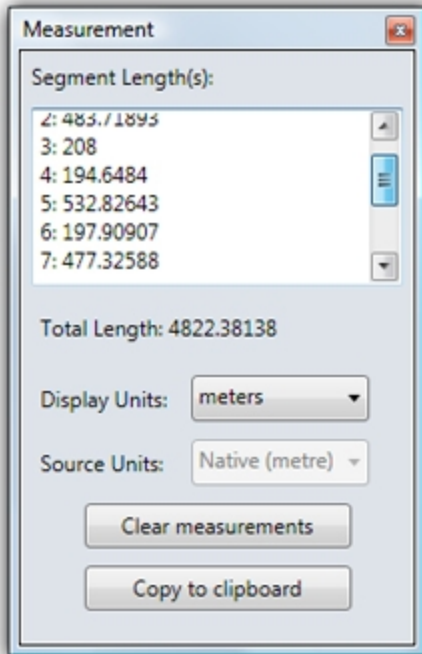
To measure the distance between two points:

1. Click the **Measure icon** on the toolbar (or choose **Measure** from the **Tools** menu) if the Measure tool is not already active. The Measurement pane appears.
2. Click in the Map pane at the point where you wish to begin measuring.
3. Click the map again at a second point. The distance between these points is listed in the Segment Length(s) field preceded by "1:" (**Note:** For a single measurement, this distance is also the value reported as the Total Length below the Segment Length(s) field).

To measure the total distance of several line segments:

1. Perform steps 1 – 3 above.
2. Click the image again at a third point, and a fourth, etc. Each time a point is clicked on, the distance between that point and the previous point is added to the distance displayed in the "Total

Length" field, as shown below.



NOTE: By default, measurements are displayed in the same unit as the source units of the image. To change the display unit, see "Setting Measurement Units" on page 37.

Clearing Measurements

To clear the measured points so you can perform a new measuring operation, do one of the following:

- Click **Clear measurements** in the Measurement pane.
- Choose **Clear measurements** from the **Tools** menu.

Copying Measurement Data for Use Elsewhere

*To use the collected measurement data elsewhere, click **Copy data to clipboard**, then paste the data into another application.*

Closing and Reopening the Measurement Pane

You can close the Measurement pane by clicking the **X** in the upper right corner.

If you wish to see it again, click the **Measure icon** again or right-click the image and choose **Measure** from the context menu.

Getting Out of Measurement Mode

To get out of Measurement mode, click any other tool icon.

Setting Measurement Units

In order to report measured distance, GeoViewer needs to know both the measurement unit in which your image was first georeferenced (the *source unit*) and what unit you want the results of your measurements reported in (the *display unit*).

The Display Unit

If you have never changed the display unit, the default display unit for a given image is the same as its source unit. Once you have specified a display unit, that unit will be the default display unit until you change it again.

For images with known source units, you can choose any of the following display units:

- meters
- kilometers
- feet
- miles
- pixels

To specify a display unit:

1. Click the **Measure icon** on the toolbar (or right-click in the Map pane and choose **Measure** from the context menu) if the Measure tool is not already active. The Measurement pane appears.
2. In the Measuring pane, select a measurement unit from the **Display Units** drop-down menu.

The Source Unit

GeoViewer reads the source units of a georeferenced image (meters, kilometers, feet, miles or "other") when you add it as a layer. That unit is reported as the native unit in the Source Unit drop-down in Measurement pane, and this drop-down becomes unavailable.

You may have images for which the source measurement unit is not known. For example, the geocoordinates for your image may be stored in a world file, or it may have no geocoordinates at all.

For such cases, GeoViewer enables you to supply the source unit yourself. If you know the ground resolution (how many feet, meters or other units each pixel of the image represents), you can enter the appropriate source unit and select any desired display unit.

If you do not know the image's ground resolution, then you should set the display unit to pixels. When the display unit is set to pixels, the source unit is ignored.

To specify a source unit:

1. Click the **Measure icon** on the toolbar (or right-click in the Map pane and choose **Measure** from the context menu) if the Measure tool is not already active. The Measurement pane

appears.

2. In the Measuring pane, select a measurement unit from the **Source Units** drop-down menu.

Chapter 8: Exporting Maps and Layers

In 2D mode, GeoViewer enables you to save a particular view or an entire map as a GeoTIFF, PNG or JPEG file.

NOTE: LiDAR data can only be exported as two-dimensional layers.

Exporting the Current View

Exporting the current view creates a file of exactly what you see in the Map pane at that moment (minus the Measurement pane, if it is open).

Exporting a Map

When you export a map, GeoViewer creates a file showing the region covered by all the layers in the map (called the *minimum bounding box*), regardless of which layers are hidden or shown.

This means that if your map includes six mosaic tiles of equal size and you have hidden five of them (by deselecting them – see "Hiding and Showing Layers" on page 17), the single layer you have left selected will be the only layer visible in the exported image, but it will take up only one sixth of the exported image's area and it will be positioned in proper relation to the five invisible ones.

To export a view or an entire map:

1. Select **Export** from the **tools** menu, then choose **Export current view** or **Export map**. The Export Map or Export View dialog appears.
2. Select a file format from the **Format** drop-down menu. You can save your view or map as a GeoTIFF, PNG or JPEG.
3. Select a resolution from the **Resolution** drop-down menu. The default resolution is Medium (2048 x 2048 pixels). Note that the dimensions at Full resolution depend on those of the source image.
4. Verify the compression quality for JPEG or PNG using the slider in the JPEG Options or PNG Options panel. For JPEG, higher quality will result in greater visual detail. PNG is a loss-less format, so a higher compression quality here simply takes more time to export and creates a slightly smaller file.
5. [Optional] If you want a world file to be created, select the **Write world file** checkbox.
6. Enter a path and file name (alternatively, click **Browse** to select an output file path, choose a folder and file name, and click **Save**).
7. Click **OK**.

Your file is created in the folder you specified.

Chapter 9: Preferences

GeoViewer enables you to set your preferences for how layers' georeferencing is handled, for colors and other aspects of the user interface, and for reminders to check for updates.

Setting Georeferencing Preferences

The georeferencing preferences enable you to specify whether or not world files should be read, how coordinate reference systems (CRSs) should be reconciled among layers, and what warnings you would like to receive.

Read World Files

If world files are present and the "Read world files" checkbox is selected, information in metadata will be ignored in favor of the world file.

By default this checkbox is clear and world files are not read.

Coordinate Reference System Reconciliation

You can specify one of the following as GeoViewer's default behavior when a layer is added to the map:

- Reproject added layers to WGS84
- Use layer's native CRS
- Ask me what to do

NOTE: When a world file is present and the "Read world files" checkbox and the "Use layer's native CRS" radio button are both selected, world files will take precedence over native georeferencing.

Warnings

There are cases where reprojection is not possible or the layer has no native CRS (see "Reconciling Projections Among Layers" on page 27). By default GeoViewer warns you in these cases and also when it is about to reproject a layer to WGS84.

TIP: When you are warned that an layer is about to be reprojected, you have the opportunity to select the "Always reproject without asking" checkbox. This clears the "Warn me before reprojecting layer" checkbox in your preferences.

Setting User Interface Preferences

You may change the look and feel of the GeoViewer interface using your UI preferences settings.

To set or change preferences:

1. Choose **UI Preferences** from the **Options** menu. The UI Preferences dialog box appears.
2. Select a tab on the left and make desired changes (see below).

3. Click **OK**.

Status Bar Preferences

The CRS of the map is shown in the status bar in the lower left corner. The status bar also tells you whether GeoViewer is idle or working, and shows your cursor position in several common georeferencing modes. You can choose to show or hide the status bar and which modes your cursor position is reported in. Latitude/Longitude and Native are selected by default.

Latitude/Longitude can be expressed decimally or by DMS (degrees, minutes, seconds). Decimal is the default.

Viewer Background Preferences


When you view your map at a level such that it does not completely fill the Map pane, the viewer background is visible around the region occupied by your map. By default GeoViewer uses black. You may choose a custom color for the background if you wish.

Line Weight, Line Color and Layer Names

You may select the width and color of most lines in the user interface, such as vectors, measurements and layer boundaries in the Map pane, and the navigation rectangle in the Overview pane. You may also turn layer boundaries on or off and enable the layer name tool tip, which displays a layer's name when you hover over it in the Map pane.

NOTE: Vector settings can also be specified for a particular layer on the **Layer** menu or the Project context menu (see "Context Menus" on page 12).

Tips and Tricks

You may disable the Tips and Tricks dialog so that it is not displayed when you run GeoViewer. You can always access Tips and Tricks from the Help menu or by clicking the GeoViewer icon  on the toolbar.

3D Viewing Preferences

Several aspects of viewing on the 3D tab can be changed. You can enter a value by which to exaggerate the z axis, which will bring features into greater relief. The number of points displayed at once can also be raised or lowered from the default of 500,000.

For the color gradient that helps you visualize different elevations in the data, you can select from a drop-down menu of 23 choices. You can also manually override GeoViewer's automatic z range behavior and supply your own minimum and maximum z values for your map.

NOTE: Minimum and maximum z values that you set manually are stored in your project file.

Finally, you can show or hide the focal point axis markings or the bounding box of the data (by default, both are shown).

Setting GeoViewer Update Preferences

The GeoViewer update preferences enable you to specify that GeoViewer should remind you to check for a newer version, and how often it should remind you (for information about checking for updates manually, see "Chapter 2: Installing or Updating GeoViewer" on page 3).

By default GeoViewer reminds you every 7 days to check for a new version.

To change the number of days between reminders:

1. Choose **GeoViewer update preferences** from the **Options** menu. The GeoViewer Update Preferences dialog appears.
2. Enter a number of days and click **OK**.

GeoViewer will remind you check for updates at the frequency you specified to. If a new version becomes available, the Check Updates dialog appears and you may download the new version (see "Chapter 2: Installing or Updating GeoViewer" on page 3).

To disable the reminders:

1. Choose **GeoViewer update preferences** from the **Options** menu. The GeoViewer Update Preferences dialog appears.
2. Clear the **Remind me to check for updates** checkbox. The "Remind me every x days" field becomes unavailable ("grayed out").
3. Click **OK**.

Appendix A: Technical Information

Supported File Formats

Input Formats

The following table lists the file formats GeoViewer opens along with their file extensions:

File Format Name	Extension(s)
ECW	.ecw
ERDAS IMAGINE	.img
ERDAS LAN	.lan
ESRI Shapefiles	.shp
GeoTIFF and TIFF	.tif .tiff
JPEG 2000	.jp2
LAS	.las
LizardTech MrSID (including MG4)	.sid
NITF	.ntf
Original JPEG	.jpg
PNG	.png
Raw (uncompressed) BBB	.bil .bip .bsq
Sun Raster	.ras
USGS DOQ	.nes .ses .nws .sws .doq
Windows Bitmap	.bmp

NOTE: LAS and MG4 files must be stored on a local computer or network.

See also "Adding a Layer to View" on page 15.

All of the supported input formats can take world files except LAS and MG4.

TIP: The rule for arriving at the proper world file extension for a given file format is that the first and third letters of the format's extension are taken and a "w" is appended after them. Thus, a world file for a MrSID (".sid") file would have the extension ".sdw".

Output Formats

The following table lists the file formats in which GeoViewer exports images along with their file extensions:

File Format Name	Extension(s)
GeoTIFF	.tif
PNG	.png
JPEG with world files	.jpg

See also "Chapter 8: Exporting Maps and Layers" on page 39.

Viewing System Information

The System Information pane includes details pertaining to your installation of GeoViewer, including the full build version numbers and URLs for the application's installation directories. This information can be used to troubleshoot problems or submit bug reports.

To view system information, choose System Information from the Help menu.


Appendix B: Product and Company Information

Displaying Tips and Tricks

When you open GeoViewer, a dialog displays information that might help you work more efficiently, as shown below. The information may be a procedural tip, a shortcut or other trick, or even a promotional note.

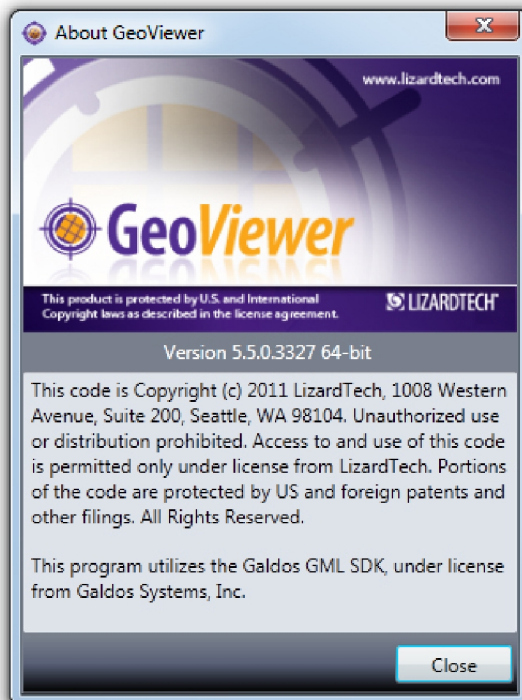
From this dialog you can use the buttons to view the previous tip, the next one, or all of them at once, and you can instruct GeoViewer not to show you tips and tricks on startup anymore.

To prevent the Tips and Tricks dialog from appearing on startup, clear the "Show tips at startup" checkbox.

To access the Tips and Tricks dialog later, click the GeoViewer logo  on the toolbar or choose "Tips and Tricks" from the "Help" menu.

Displaying the GeoViewer About Box

Information about which version of GeoViewer you are running is available in the About box, shown below. The About box also contains copyright information.



To view the About box, choose About GeoViewer from the Help menu.

About LizardTech

Since 1992, LizardTech has delivered state-of-the-art software products for managing and distributing massive, high-resolution geospatial data such as aerial and satellite imagery and LiDAR data. LizardTech pioneered the MrSID® technology, a powerful wavelet-based image encoder, viewer, and file format. LizardTech has offices in Seattle, Denver, London and Tokyo and is a division of Celartern Technology Inc. (NASDAQ: 4330). For more information about LizardTech, visit www.lizardtech.com.

Other LizardTech Products

Thank you for using LizardTech™ GeoViewer. We at LizardTech are glad to have you as a customer. While you're "in the shop," explore LizardTech's other products for managing high-quality images and documents.

ExpressView Browser Plug-in

Fast and Easy Viewing of Large Images

If you like the features in GeoViewer, consider ExpressView Browser Plug-in. ExpressView enables you to view, navigate and print MrSID and JPEG 2000 imagery in Internet Explorer or Firefox. Like GeoViewer, ExpressView enables you to save a portion of an image in a number of other image formats. ExpressView Browser Plug-in is quickly downloaded, easily installed, and free for individual use. It's the most convenient way to view MrSID and JPEG 2000 imagery over networks!

For more information about ExpressView Browser Plug-in visit <http://www.lizardtech.com/download/>.

ExpressView Browser Plug-in

Fast and Easy Viewing of Large Images

ExpressView™ Browser Plug-in enables you to view, navigate and print MrSID and JPEG 2000 imagery in Internet Explorer or Firefox. Like GeoViewer, ExpressView enables you to save a portion of an image in a number of other image formats. ExpressView Browser Plug-in is quickly downloaded, easily installed, and free for individual use. It's the most convenient way to view MrSID and JPEG 2000 imagery over networks!

For more information about ExpressView Browser Plug-in visit <http://www.lizardtech.com/downloads/viewers.php>.

GeoExpress

The Industry's Best Image Manipulation and Compression Software

With powerful tools for reprojecting, color balancing, and mosaicking, GeoExpress® software is the industry's choice for manipulating and compressing geospatial imagery to industry standard formats.

You can configure Express Server and Spatial Express® software directly from GeoExpress, which makes it the ideal command center for your storage and distribution workflows.

For more information about GeoExpress visit www.lizardtech.com/products/geo/.

LiDAR Compressor

LiDAR Data Meets the MrSID Format

LizardTech LiDAR Compressor™ software enables you to turn giant point cloud datasets into efficient MrSID files that retain 100 percent of the raw data at just 25 percent or less of the original file size (lossless compression). If storage requirements are critical, you can reduce your LiDAR file sizes by 90 percent or more by choosing a higher compression ratio and letting LiDAR Compressor select the best way to reach a desired file size (lossy compression). Unlike raw LAS or ASCII data, LiDAR files compressed to MrSID are easily managed resources you can extract derivatives from again and again.

For more information about LiDAR Compressor visit www.lizardtech.com/products/lidar/.

Express Server

Image Delivery Software for Geospatial Workflows

LizardTech Express Server software is the best solution for distributing imagery in MrSID or JPEG 2000 format. With Express Server, users on any device access imagery faster, even over low-bandwidth connections. Express Server is faster, more stable and easier to use than any other solution for delivering high-resolution raster imagery.

For more information about Express Server visit <http://www.lizardtech.com/products/exp/>.

MrSID Decode SDK

Integration of MrSID Support into Third-Party Applications

The MrSID Decode SDK provides a framework for extracting raster or LiDAR data from MrSID files, including MrSID Generation 4 (MG4™). Used as the foundation for LizardTech's LiDAR Compressor™ and its Express Suite® line of geospatial products – GeoExpress, Express Server and Spatial Express software – the MrSID Decode SDK is a robust toolkit suitable for complex application development needs.

MrSID Decode SDK is available for free download at <http://developer.lizardtech.com>.

GeoViewer and Patents

This software is protected by U.S. Patent Nos. 7,218,789, 7,454,084, 7,508,991 and 5,710,835; Canadian Patent No. 2,236,943; and European Patent No. 0,864,135 and by additional U.S. and Foreign Patents Pending.

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