

LizardTech™

MrSID Plug-in for 3D Analyst

User Manual

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Introduction

Thank you for using LizardTech™ MrSID Plug-in for ArcGIS 3D Analyst. This plug-in enables you to import LiDAR point cloud data stored in MrSID Generation 4 (MG4) format into ESRI's ArcGIS software. ArcGIS handles LiDAR data by importing it into a multipoint feature class. These tools enable you to do the same thing with MrSID LiDAR files so that you can use them in ArcGIS to create surfaces for use in line-of-sight and terrain modeling, visualization, and spatial analysis.

The purpose of this user manual is to give you quick information about how to use MrSID Plug-in for ArcGIS 3D Analyst. To access this documentation as WebHelp within the application, select **Help Topics** from the **Help** menu.

System Requirements

The following system is recommended for installing and running MrSID Plug-in for ArcGIS 3D Analyst.

NOTE: Before you install MrSID Plug-in for ArcGIS 3D Analyst you must install ArcGIS version 9.3.1 with “.NET Support” (which requires you to have previously installed .NET v2 or higher).

Operating System and Software

- One of the following operating systems:
 - Microsoft Windows 2000 Professional, Service Pack 4
 - Microsoft Windows XP, Service Pack 3
 - Microsoft Windows 2003 Server Standard, Enterprise & Datacenter, Service Pack 2
 - Microsoft Windows 2003 Server Terminal Services, Service Pack 2
 - Microsoft Windows 2008 Server Standard, Enterprise & Datacenter
 - Microsoft Windows Vista, Service Pack 1
 - Microsoft Windows 7
- Microsoft Visual C++ 2008 Runtime Libraries (included)
- ArcGIS version 9.3.1 with “.NET Support”

Hardware

- 1.6-GHz Intel Core Duo, Pentium 4 or Xeon processor
- 2 gigabytes (GB) RAM
- 2.4 GB disk space

MrSID Plug-in for ArcGIS 3D Analyst is a 32-bit application, but you may run it on a 64-bit system if you wish.

Installation

Your downloaded installation directory contains two folders, LT.3DAnalystPlugin and MS.VCRT.

NOTE: Before you install MrSID Plug-in for ArcGIS 3D Analyst you must install ArcGIS version 9.3.1 with “.NET Support” (which requires you to have previously installed .NET v2 or higher).

Installing MrSID Plug-in for 3D Analyst

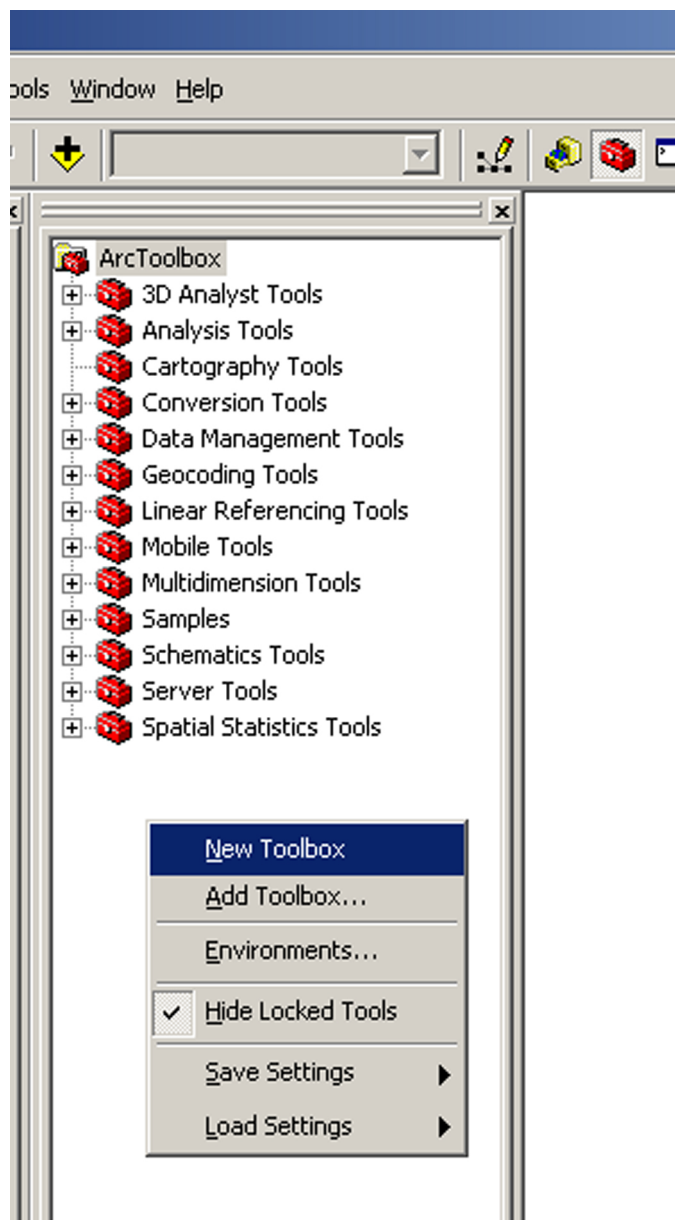
To install MrSID Plug-in for ArcGIS 3D Analyst:

1. In your installation directory, open the folder **LT.3DAnalystPlugin**. Double-click the file **setup.exe**. The installation wizard runs.
2. Follow instructions in the installation wizard until the installation is completed and click **Finish**.

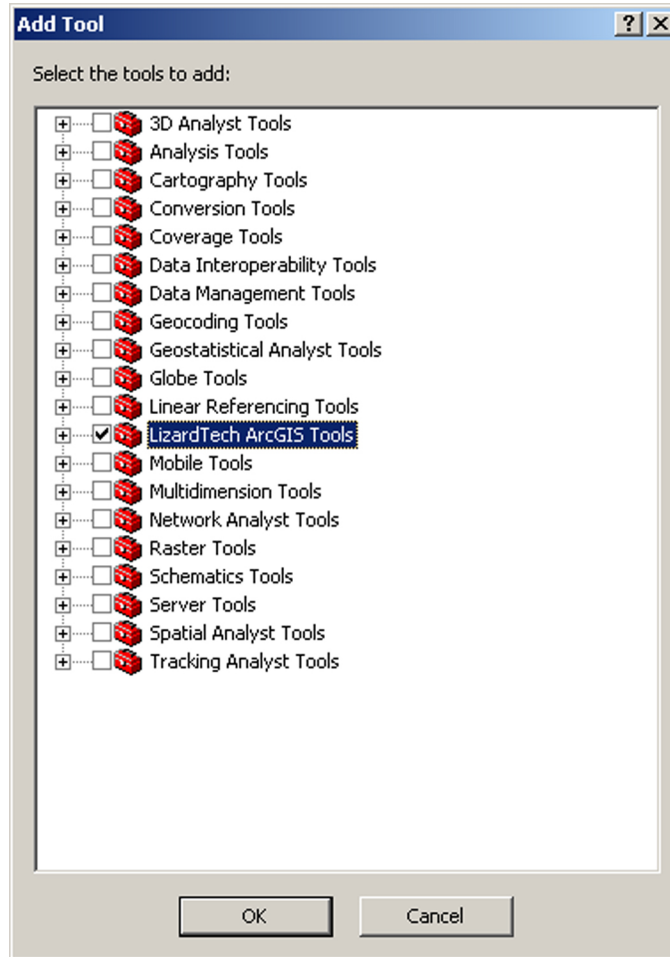
Making the MrSID Plugin-Tools Available in ArcGIS

To make the MrSID Plug-in tools available in ArcGIS:

1. In ArcMap, click the **ArcToolbox icon**. The ArcToolbox window opens displaying a list of tools.
2. Right-click on any white space in the ArcToolbox window and choose **New Toolbox** as shown below. A new toolbox is created with its name highlighted.

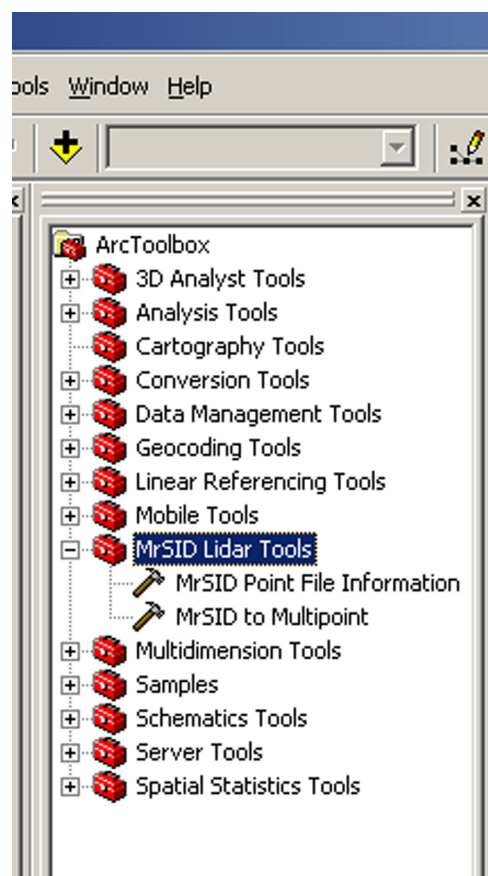


3. Name this toolbox suitably (we suggest **MrSID LiDAR Tools**).
4. Right-click the newly created toolbox and choose Add, then choose Tool. The Add Tool dialog appears.
5. Select the **LizardTech ArcGIS Tools** checkbox as shown below.



6. Click **OK**.

The "MrSID to Multipoint" and "MrSID Point File Info" tools are now available in your list of tools under MrSID LiDAR Tools (or whatever name you gave the toolbox), as show below.



Use of these tools is very similar to the corresponding LAS tools in 3DAnalyst. With the MrSID to Multipoint and MrSID Point File Info tools you can import MrSID LiDAR files into ArcGIS to create DEMs and, with 3D Analyst, terrain data sets.

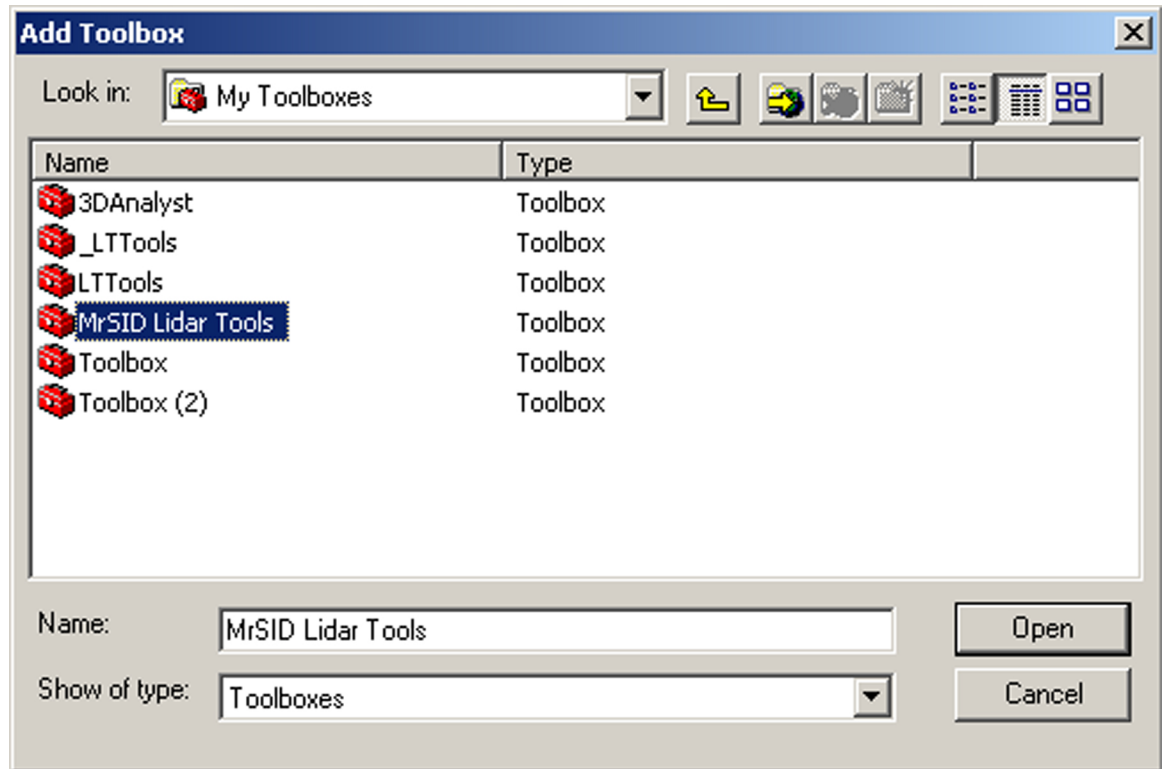
In order for the newly created toolbox to appear in the ArcToolbox windows the next time you run ArcGIS, you must save your ArcToolbox settings. If you forget to save your ArcToolbox settings, you can always add the MrSID LiDAR Tools toolbox again later.

To save your ArcToolbox settings:

1. Right-click on any white space in the ArcToolbox window.
2. Choose **Save Settings** and **To Default**.

To add the MrSID LiDAR Tools toolbox again:

1. Right-click on any white space in the ArcToolbox window.
2. Choose **Add Toolbox**. The Add Toolbox dialog appears as shown below.



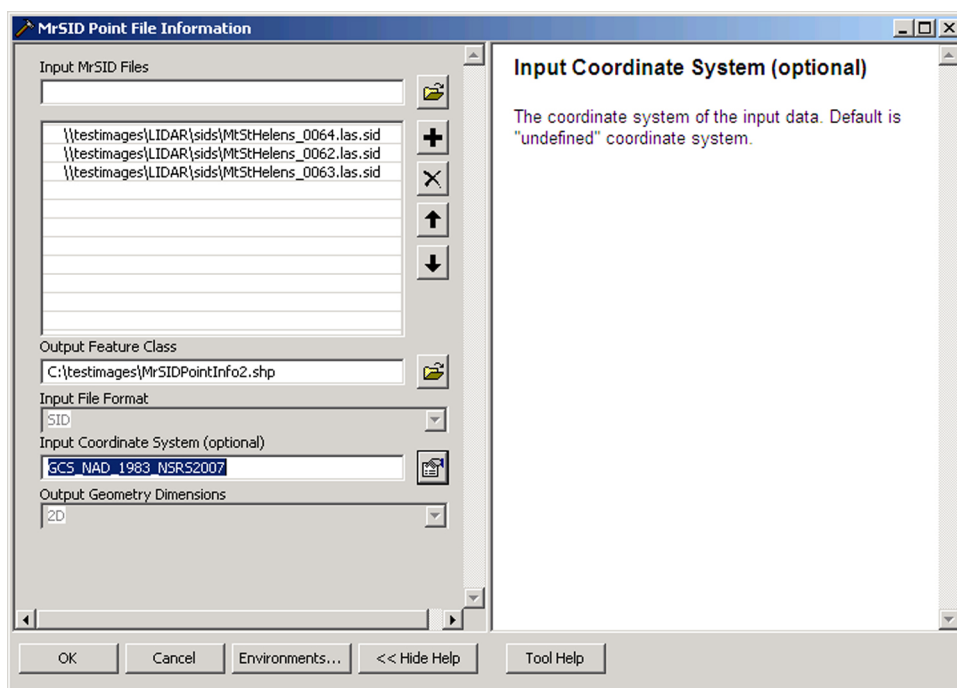
3. Select **MrSID LiDAR Tools** (or whatever name you gave the toolbox) and click **Open**.

MrSID Point File Information Tool

The MrSID Point File Information tool generates a new output feature class containing statistical information about one or more point files.

To access the MrSID Point File Information tool:

1. In ArcMap, click the **ArcToolbox icon**. The ArcToolbox window opens displaying a list of tools.
2. Click the **plus sign** next to MrSID LiDAR Tools (or whatever name you gave the toolbox). The toolbox expands to show the MrSID Point File Information and MrSID to Multipoint tools.
Note: If you have installed the MrSID plug-in (see "Installing MrSID Plug-in for 3D Analyst" on page 3) but the toolbox is not in the list, you must create a toolbox for them or, if one was created but not saved, add the toolbox back to the ArcToolbox window (see "Making the MrSID Plugin-Tools Available in ArcGIS" on page 3).
3. Double-click **MrSID Point File Information**. The MrSID Point File Information tool's interface appears as shown below.



Usage Tips

Input file(s) must be in MrSID Generation 4 Format.

The statistical information presented in the feature attribute table consists of the point count, average point spacing, z minimum, and z maximum of each point file entered. A separate row is created for each input file encountered. The point spacing is an estimate that assumes the points within the input file are evenly spaced over the XY extent of each input file.

An output polygon feature class is created with the XY extents of the input file(s).

The following environment settings affect this tool:

General:

- Current workspace
- Scratch workspace
- Output coordinate system
- Output extent
- XY resolution
- XY tolerance
- Z Resolution
- Z Tolerance
- M Resolution
- M Tolerance
- Output has Z Values
- Output has M Values

Geodatabase:

- Output XY domain
- Output Z domain
- Output M domain

Command Line Syntax

```
MrSIDPointFileInfo <in_input_files;in_input_files...> <out_output_feature_class> <SID> {in_input_coordinate_system} <3D>
```

MrSID Point File Information Command Line Parameters

Parameter	Description
<in_input_files;in_input_files...>	Enter one or more MrSID files.
<out_output_feature_class>	The output feature class.
<SID>	The format of the input file(s) must be MrSID Generation 4.
{in_input_coordinate_system}	The coordinate reference system (CRS) of the input data. Default is to use CRS of the corresponding input file if there is one and the "undefined" CRS otherwise. If the input files do not contain a CRS but you know what it is, specify it here.
<2D>	The output Geometry Dimension is always 3D.

Command Line Example

```
MrSIDPointFileInfo '\\t-estimages\Lidar\sids\MtStHelens\tiles\lossless\Exp_H2.sid'
```

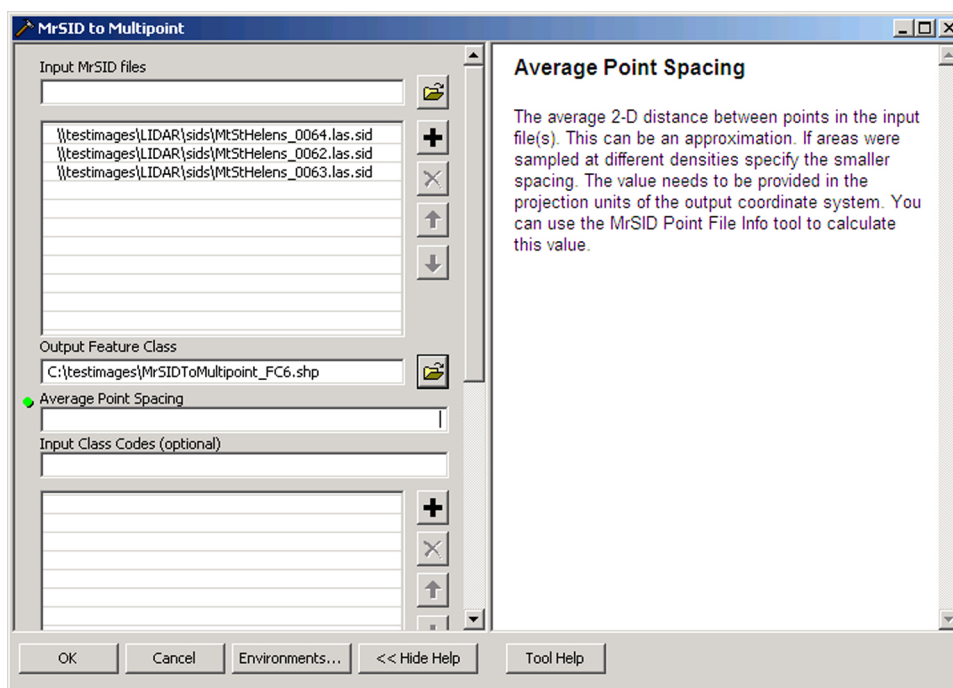
C:\testimages\Info.shp SID # 2D

MrSID to Multipoint Tool

The MrSID to Multipoint tool imports one or more files in MrSID format, into a new multipoint feature class. Substantially it is similar to the LAS to Multipoint tool.

To access the MrSID to Multipoint tool:

1. In ArcMap, click the **ArcToolbox icon**. The ArcToolbox window opens displaying a list of tools.
2. Click the **plus sign** next to MrSID LiDAR Tools (or whatever name you gave the toolbox). The toolbox expands to show the MrSID Point File Information and MrSID to Multipoint tools.
Note: If you have installed the MrSID plug-in (see "Installing MrSID Plug-in for 3D Analyst" on page 3) but the toolbox is not in the list, you must create a toolbox for them or, if one was created but not saved, add the toolbox back to the ArcToolbox window (see "Making the MrSID Plugin-Tools Available in ArcGIS" on page 3).
3. Double-click **MrSID to Multipoint**. The MrSID to Multipoint tool's interface appears as shown below.



Usage Tips

If you aren't interested in importing points based upon their return number, or if all returns specified in the file(s) are set to 0 because the points have been filtered or classified, select ANY_RETURN (or equivalently, don't pick any filter values).

The following environment settings affect this tool:

General:

- Current workspace
- Scratch workspace
- Output coordinate system
- Output extent

Geodatabase:

- Output XY domain
- Output Z domain

Command Line Syntax

```
MrSIDImport <inputFile;inputFile...> <outFeatureClass> <averagepointspacing> {classcode;classcode...} {ANY_RETURNS | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | LAST_RETURNS} {crs}
```

MrSID to Multipoint Tool Command Line Parameters

Parameter	Description
<inputFile;inputFile...>	Enter one or more MrSID files.
<outFeatureClass>	The newly created multipoint feature class to which LiDAR points will be added.
<averagepointspacing>	The average 2-D distance between points in the input file(s). This can be an approximation. If areas were sampled at different densities specify the smaller spacing. The value needs to be provided in the projection units of the output coordinate system. You can use the MrSID Point File Info tool to calculate this value.
{classcode;classcode...}	Numeric classification codes to use as a query filter. The default is no filter.
{ANY_RETURNS 1 2 3 4 5 6 7 8 LAST_RETURNS}	The return values used as a query filter. Valid return values are 1-5, LAST_RETURNS, and ANY_RETURNS. The default is no filter (which is the same as ANY_RETURNS).

Parameter	Description
{crs}	The coordinate reference system (CRS) of the input file(s). This will be set on the output feature class and is assumed to be the same for all input files. If you don't specify a CRS here (default), the tool will use the CRS defined in the first input file if there is one or use the "undefined" CRS otherwise. If the input files do not contain a CRS but you know what it is, specify it here.

Command Line Example

```
MrSIDImport '\\testimages\Lidar\sids\MtStHelens\tiles\lossless\Exp_  
H2.sid' C:\testimages\H2_multipoint.shp 0.68 # ANY_RETURNS #
```

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 MrSID® (Multiresolution Seamless Image Database), a powerful wavelet-based image encoder, viewer, and file format, and sits on the Technical Committee of the Open Geospatial Consortium (OGC) for the purpose of extending the capabilities of JPEG 2000 to geospatial applications, driving cross-platform interoperability and rapid Internet distribution for geospatial imagery. LizardTech has offices in Seattle, London and Tokyo and is a division of Celartem Technology Inc., (Hercules: 4330). For more information about LizardTech, visit www.lizardtech.com.

Other LizardTech Products

We at LizardTech are glad to have you as a customer. While you're "in the shop", explore LizardTech's other great products for compressing, managing and distributing geospatial imagery and LiDAR data.

For instant notification of new LizardTech product releases and patches add the following link to your favorite RSS feed reader:

<http://www.lizardtech.com/files/rss/updates.xml>

GeoViewer

Efficient Viewing and Exporting of MrSID and JPEG 2000 Layers

GeoViewer is LizardTech's free, standalone application for viewing geospatial imagery, vector overlays and LiDAR data. GeoViewer enables you to combine, view and export visual layers from varied sources, such as local repositories, Express Server catalogs, and WMS and JPIP servers. GeoViewer supports a wide range of input formats and exports to GeoTIFF, PNG and JPEG. It's the most efficient means of viewing MrSID and JPEG 2000 images.

For more information about GeoViewer visit <http://www.lizardtech.com/download/>.

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/>.

GeoExpress

The Industry's Best Image Manipulation and Compression Software

With powerful tools for reprojecting, color balancing, mosaicking, and more, GeoExpress is the industry's choice for manipulating and compressing geospatial imagery to industry standard formats. You can also configure Express Server and Spatial Express 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/solutions/geo/.

LiDAR Compressor

LiDAR Data Meets the MrSID Format

LizardTech LiDAR Compressor enables you to turn giant point cloud data into efficient MrSID files that retain 100 percent of the quantized raw data at just 25 percent of the 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 reduce point accuracy 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 over and over again.

^{*}Quantizing is a rounding operation that discards some number of the least significant bits of data. Floating point values must be quantized before mathematical operations such as compression can be performed on them. Most LAS data is delivered to users already quantized. A typical exception is GPSTime.

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

Express Server

Image Delivery Software for Geospatial Workflows

LizardTech Express Server 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.

Express Server catalogs and manages the distribution of imagery, enabling you to integrate the world's best raster delivery technology with geospatial data stores anywhere. Express Server streams compressed images for the fastest possible delivery, whether conventionally to broadband devices and desktops or wirelessly to field personnel using low-bandwidth connections.

For more information about Express Server visit www.lizardtech.com/solutions/exp/.

Spatial Express

Database Storage and Retrieval Tools for Massive Geospatial Imagery

Spatial Express enables you to store, manage, and access massive image datasets efficiently using your Oracle Spatial database. Whether you want to maximize return on your database investment by storing raster image data hundreds of gigabytes in size, or reduce storage space requirements for that imagery by up to 95 percent while retaining image quality, or view the imagery in your geospatial applications, Spatial Express is the key link between your imagery, your database, and your users.

For more information about Spatial Express visit www.lizardtech.com/solutions/spatial/.

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