

The LViz Users Guide

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<http://lidar.asu.edu>

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Downloading and using LViz

LViz is a tool developed by Jeffrey Conner in the Active Tectonics Research Group at Arizona State University (<http://activetectonics.asu.edu/index.html>). Designed for 3D visualization of LiDAR / ALSM point and interpolated data, the tool offers import of LiDAR point cloud data (delimited text file) or interpolated surfaces (in ascii or arc ascii grid formats). LViz also offers texture mapping and user control over display settings such as data and background color. LViz was originally written for visualization of outputs from the GEON LiDAR Workflow (GLW) and is designed to run on Windows platforms. Although originally conceived for the 3D visualization of LiDAR data, LViz can be used to view any 3D point cloud data such as seismicity or gravity. Information to complete this portion of the User's Manual is from the LViz How To document written by Jeff Conner.

Step 1 Downloading LViZ

Go to lidar.asu.edu/LViz.html. Enter your name, organization,, email address, and a brief description of the intended use, click **Proceed to Download**. You will be prompted to click **Ok** to continue.

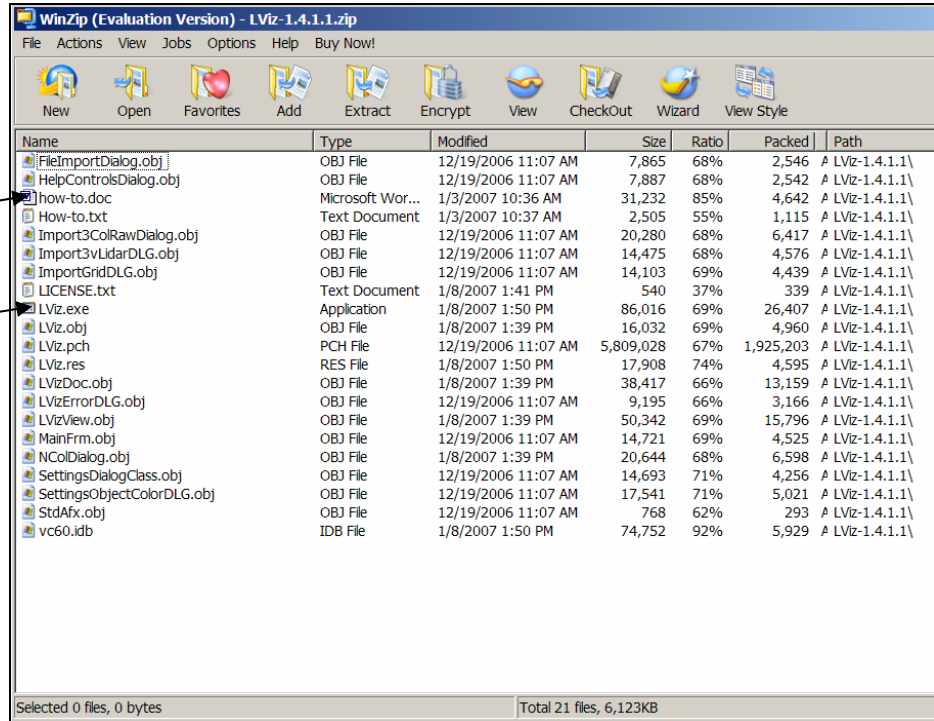
LViz Download	
Name	<input type="text" value="George Washington"/>
Organization	<input type="text" value="United States Gov"/>
Email	<input type="text" value="1stpres.@pres.com"/>
Brief description of intended use	<input type="text" value="Model top secret data"/>
<input type="button" value="Proceed to Download"/> <input type="button" value="Reset"/>	

Step 2 Launching the Program

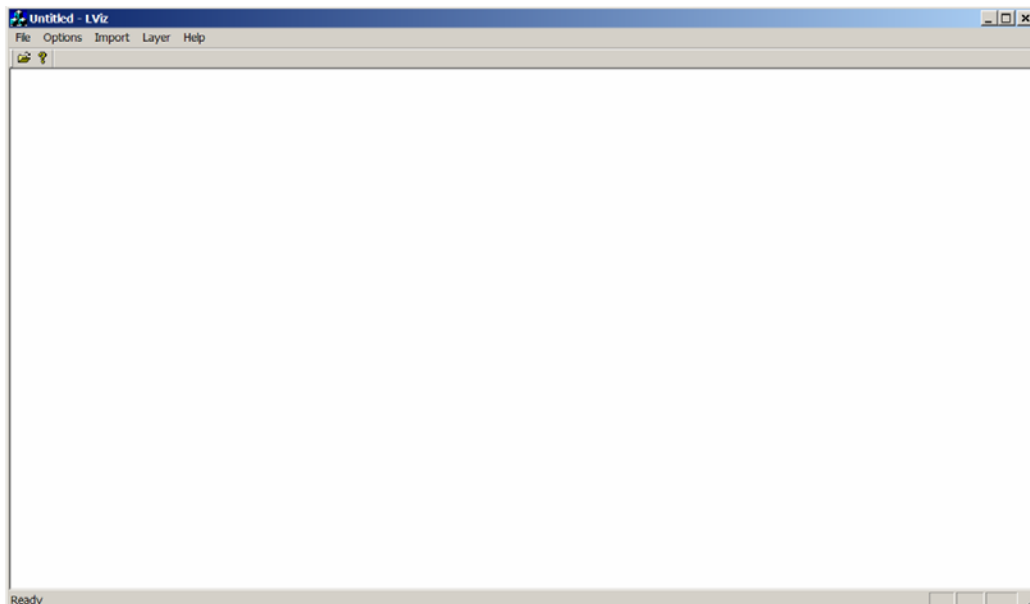
Unzip the zip file to any location on your machine. The program unzips to a folder called Release by default.

The how to file may be useful for use with LViz.

Once you have moved these files to your own preferred location, click on the LViz.exe file to run the application.

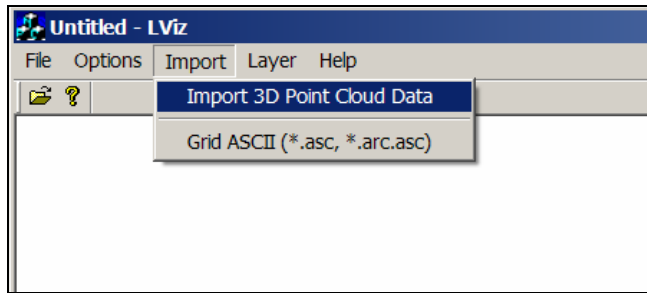


Open up the release folder or location you unzipped the file and double click on LViz.exe file. You should now be looking at a screen like the one below.

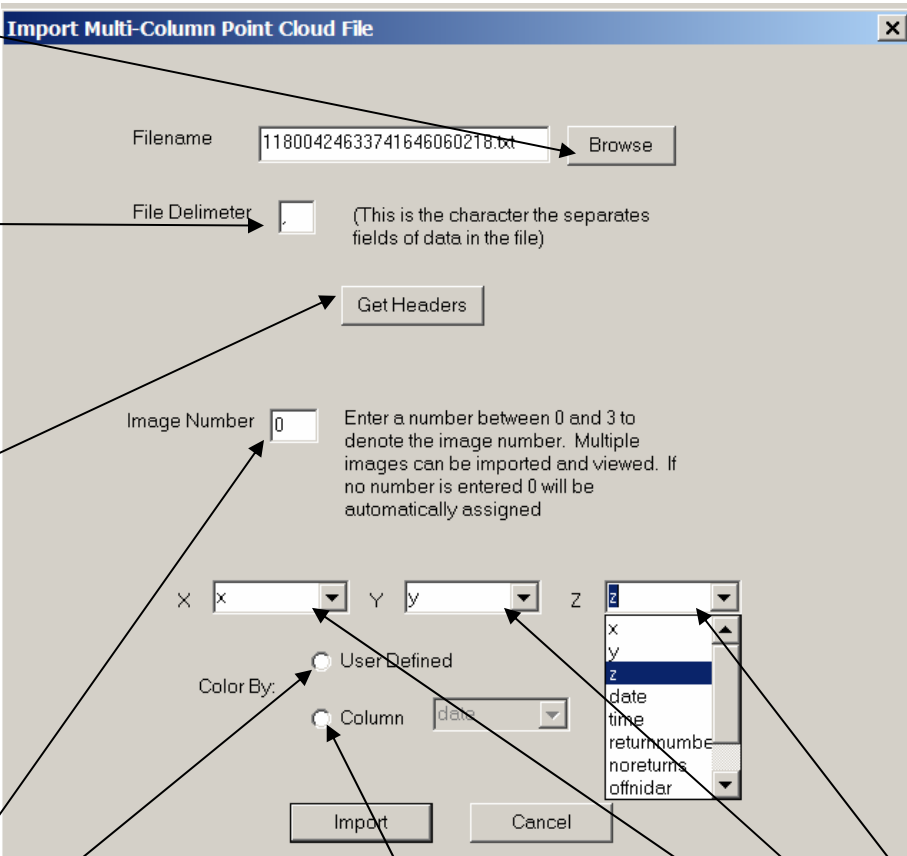


Step 3a Importing 3D Point Cloud Data

Select **Import 3D Point Cloud Data** from the **Import** menu



Browse to a txt file containing a point cloud file with a column header.



Click **Browse** to navigate to the location you have point cloud data.

If your data is not comma delimited, you can change how it is to be parsed here.

By clicking on **Get Header** this imports the header for each column in your data set is. This is important to define your x, y, and z values.

The image number denotes the number of images to be displayed. You can have 4 total.

The user-defined color can be adjusted in the options menu.

The Color By Column option is useful if your data has a column, which defines colors.

These menus allow you to choose your x, y, and z input from the header.

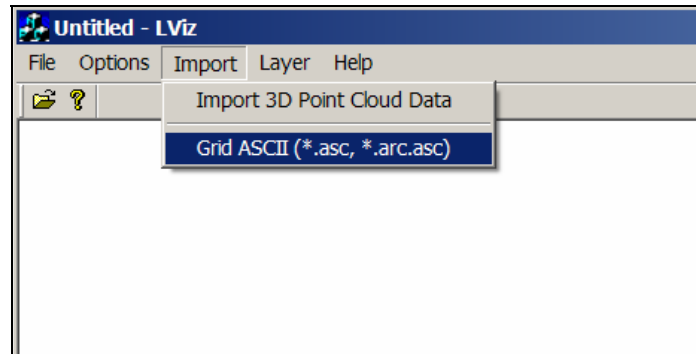
The dialog box 'Import Multi-Column Point Cloud File' contains the following fields and controls:

- Filename: 11800424633741646060218.txt
- File Delimiter: , (This is the character the separates fields of data in the file)
- Get Headers button
- Image Number: 0 (Enter a number between 0 and 3 to denote the image number. Multiple images can be imported and viewed. If no number is entered 0 will be automatically assigned)
- Color By: User Defined (selected) and Column (with a dropdown menu)
- X, Y, Z coordinate selection menus (currently set to x, y, z)
- Import and Cancel buttons

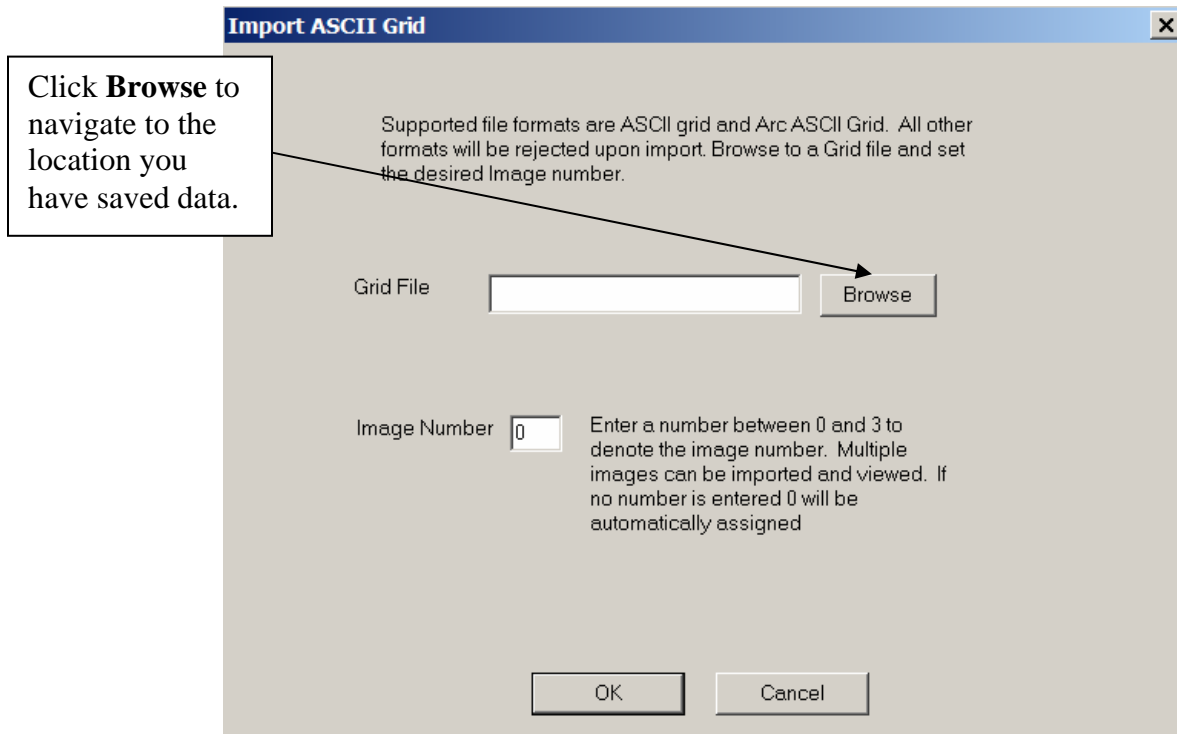
Once you have selected the option you want, click **Import**. The data may take a moment to load.

Step 3b Importing Interpolated LiDAR Data (ASCII or ARC grid file types)

Select **Grid ASCII (*.asc, *.arc.asc)** option from the **Import** menu.



Browse to a file with extensions *.asc or *.arc.asc, specify the image number and click **Ok**. The data may take a moment to load.

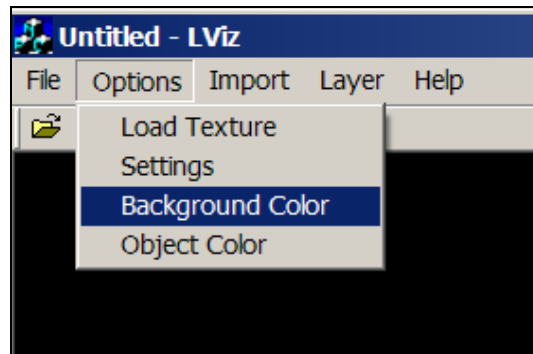


To load multiple versions of the same data set, simply repeat steps 3a or 3b as appropriate changing the image number each time you load data.

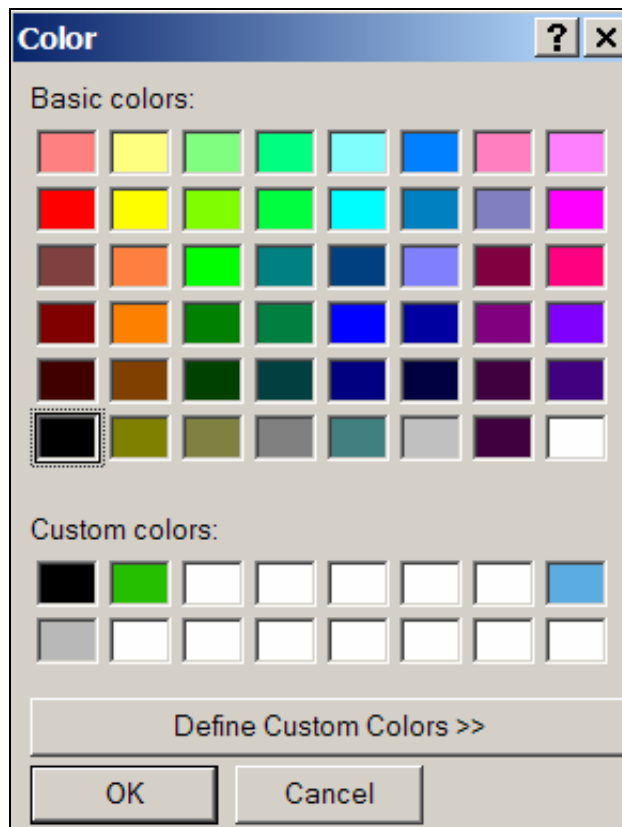
Once you have loaded the *.asc or *.arc.asc you can change the colors or parameters of the objects you view.

Step 4a Changing the image colors: the background color

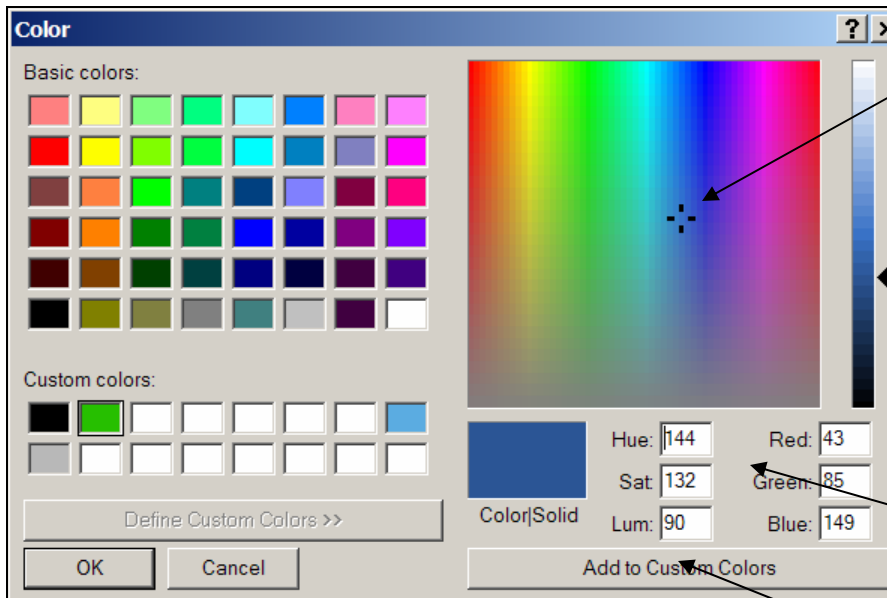
It may be useful to change the background color to black in order to visualize the data more efficiently. To change the color of the background select **Background Color** from the options menu.



A new window will pop up which looks like the one below. To change the background color to black, click the black swatch and then click **Ok**.



To change the background color to a specific color that is not available in the basic color selection area, click on an empty box in the Custom colors section and then click **Define Custom Color>>**. Use your mouse to select the color you would like. The vertical bar on the right defines the luminosity of the color. Once you have the desired color and luminosity click **Add to Custom Colors**. This will create a swatch in the Custom Colors section. You can also define the hue, saturation, and luminosity manually below the color matrix.



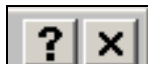
Click on the color matrix to select the color you would like. Move the pointer horizontally to change hue. Move the mouse vertically to change the saturation.

Use the slider to adjust luminosity.

You can manually enter values in this section

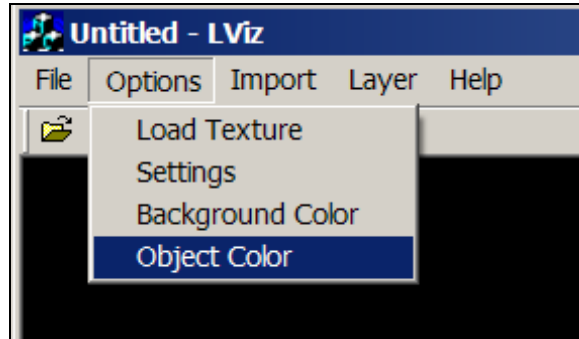
Click here to save the custom color.

For further information about using this feature click on the question mark in the upper right-hand corner of the window and then click on the item of interest, a pop up window will appear with further instructions.

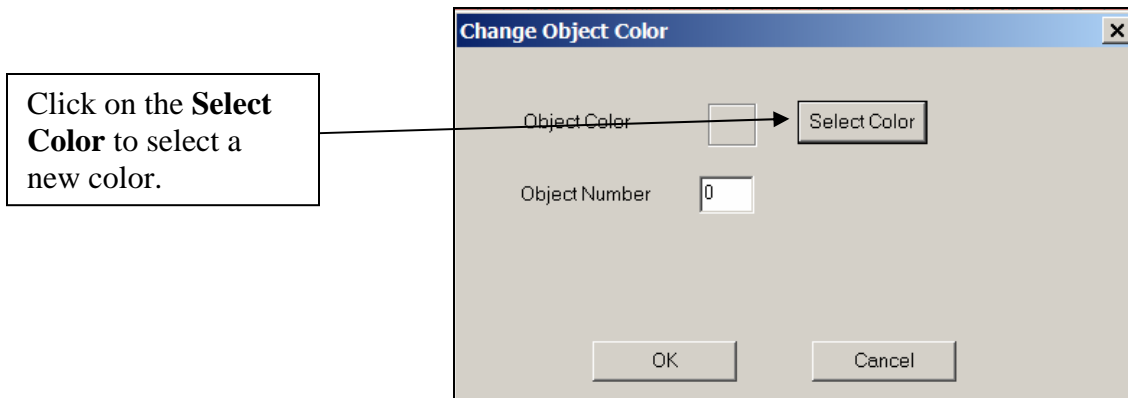


Step 4b Changing the image colors: the object color

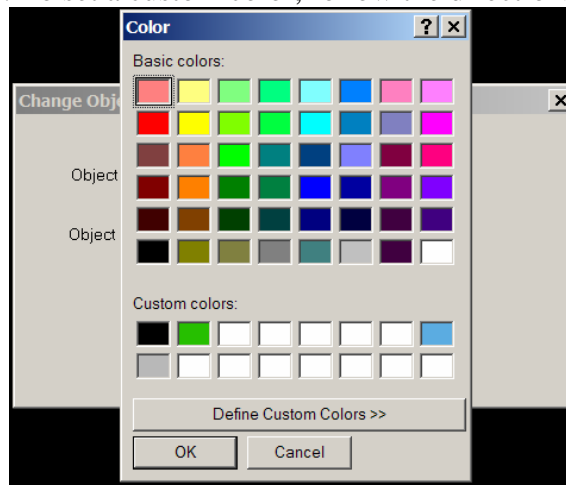
To change the color of the data select **Object Color** from the options menu.



A new window will open. In the window to the right of Object Number enter the number for the corresponding image number 0-3. To select a new color, click on the **Select Color** button.

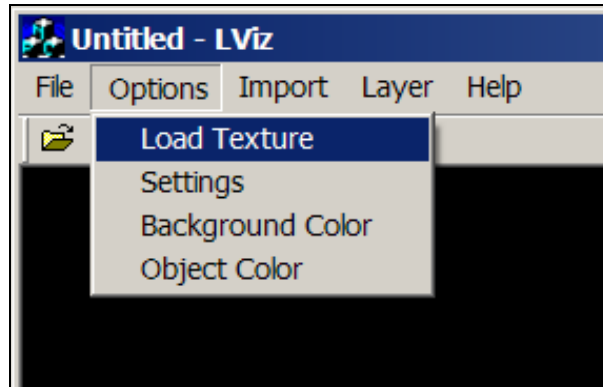


A new window will open like the one shown below. Select the color swatch you would like and then click **Ok**. To set a custom color, follow the directions in the section above.



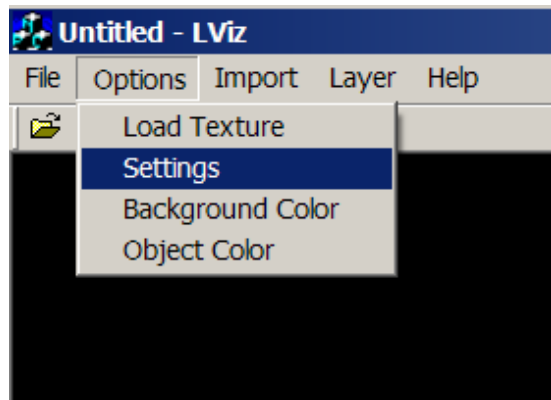
Step 5 Importing a texture

To import a texture that you can wrap onto the interpolated data surface. The texture must be in .gif format and must be the same dimensions as the data. Select the file you would like to use and then click **Ok**. This feature is not fully developed in this version of LViz.



Step 6 Changing the Settings

To change the settings, select **Settings** from the Options menu.



A window will pop up that looks like the one below. From this window you can change the camera speed, the vertical exaggeration, and the way the data is displayed. To change the camera speed, you can either slide the horizontal selection bar to the desired value or manually type it in the window. To change the vertical exaggeration you can slide the vertical selection bar to the desired value or type in the exaggeration you would like in the window. To change the way that your data is presented you can either select the Points, Wire Frame, or Polygons options. Finally, be sure to specify which image you would like to change the setting on and enter that number, 0-3, in the Image Number window. Click **Ok** to save the values and close the window.

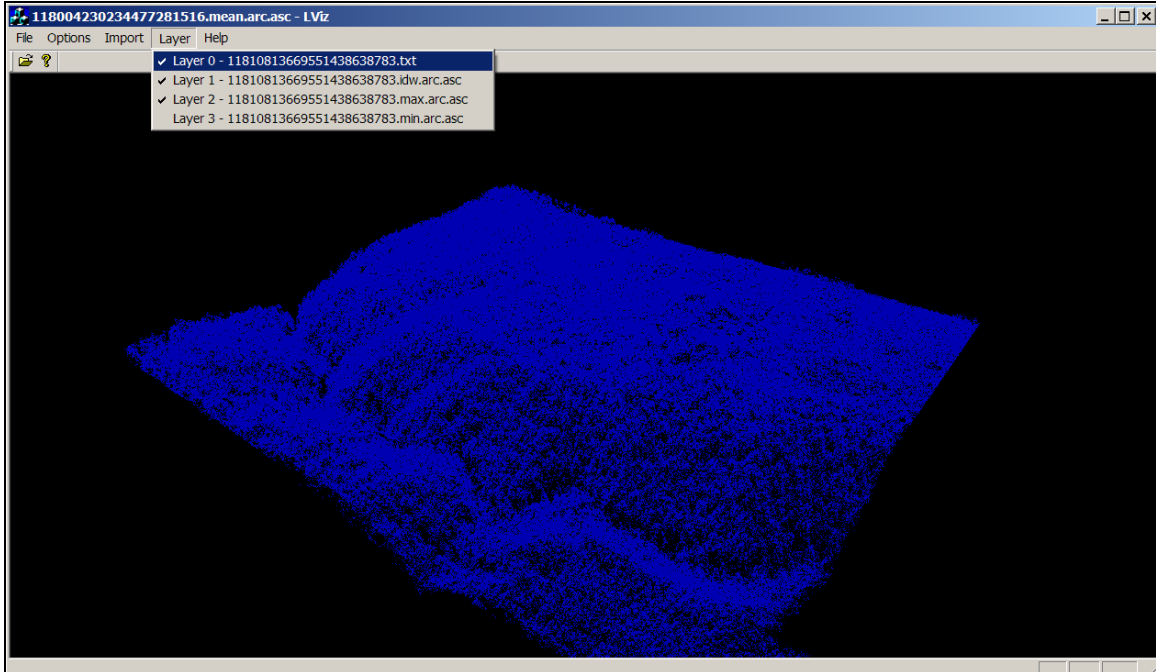
The screenshot shows a 'Settings' dialog box with the following elements:

- Camera Speed:** A horizontal slider bar and a text input field containing the number '25'. A callout box explains that the speed can be changed by sliding the bar or typing the value.
- Vertical Exaggeration:** A vertical slider bar and a text input field containing the number '1'. A callout box explains that the exaggeration can be changed by sliding the bar or typing the value.
- Polygon Options:** A group box containing three radio buttons labeled 'Points', 'Wire Frame', and 'Polygons'. A callout box instructs the user to select between these options.
- Image Number:** A text input field containing the number '0'. A callout box explains that the user should specify an image number between 0 and 3.

At the bottom of the dialog box are 'OK' and 'Cancel' buttons. A descriptive text block next to the 'Image Number' field reads: 'Enter a number between 0 and 3 to denote the image number. Multiple images can be imported and viewed. If no number is entered 0 will be automatically assigned'.

Step 6 Turning Layers On or Off

If you have loaded multiple layers you can turn them on or off by either using the Layer menu shown below or by pressing keys 1-4. When using the menu below click on the layer you would like to display. A check will appear next to the layer. To stop displaying a layer, click on the layer again and the check will be removed. You can also choose to display layers by pressing the number keys, 1-4. Each number refers to a layer or image. The 1 key corresponds to Layer 0 and the 2 key corresponds to Layer 1 and so forth.



Step 7 Navigating the Data

In order to navigate through the data you can either use the mouse or the keyboard or both.

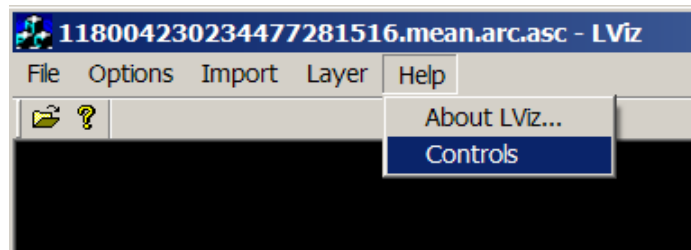
The mouse commands are as follows:

Left click and hold	Move the mouse up and down, left and right to spin and rotate the object
Right click and hold	Move the mouse right to zoom in and left to zoom out of the object

The keyboard commands are as follows:

W	Pan camera forward
S	Pan camera backwards
A	Pan camera left
D	Pan camera right
Q	Zoom in
E	Zoom out
1	Turn on/off image #0
2	Turn on/off image #1
3	Turn on/off image #2
4	Turn on/off image #3

These controls can be easily accessed in the How-to document written by Jeff Conner or by selecting controls under the Help menu.



By selecting the controls option, it will open the following page.

