
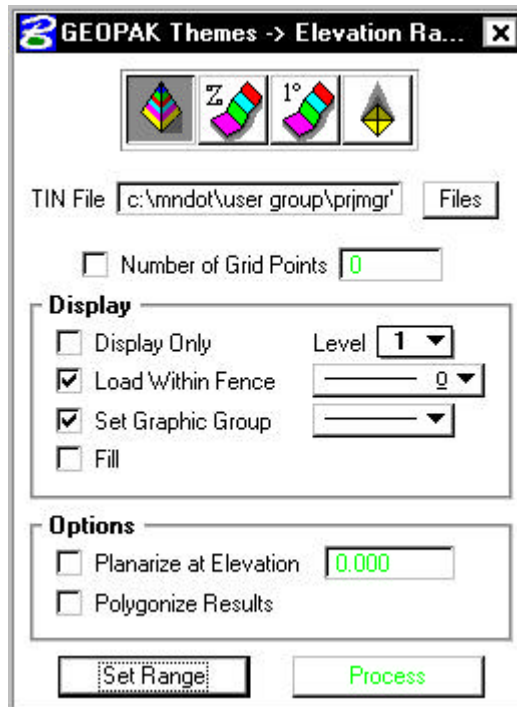


# Themes

## 12.1 Overview

<b>Feature / Function</b>	Analyze TIN or lattice models in terms of elevation, slope, or aspect ranges.
<b>Tool</b>	
<b>DTM Menu Bar</b>	Analysis > Themes

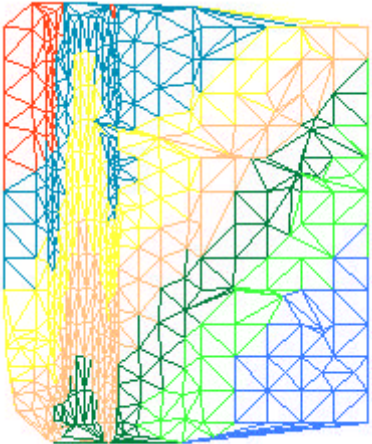
Thematic maps of elevations, slopes or aspects can be generated from triangulated models. When invoked, the Themes dialog is displayed as depicted below.

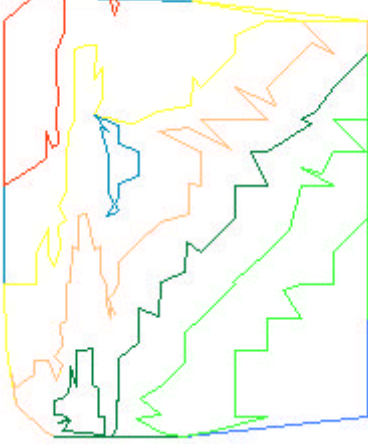


The four options are depicted across the top of the dialog and include (from left to right):

- **Elevation** - reflects ranges of elevations
- **Slope** - (in terms of **Percent** or **Degrees**) describe the angles of individual lattices or triangles. percent format
- **Aspect** - describe the direction that the triangle or lattice plane faces.

As each option is selected, the dialog title changes to reflect the selection. The rest of the main dialog remains unchanged. Let's review each field in the table below.

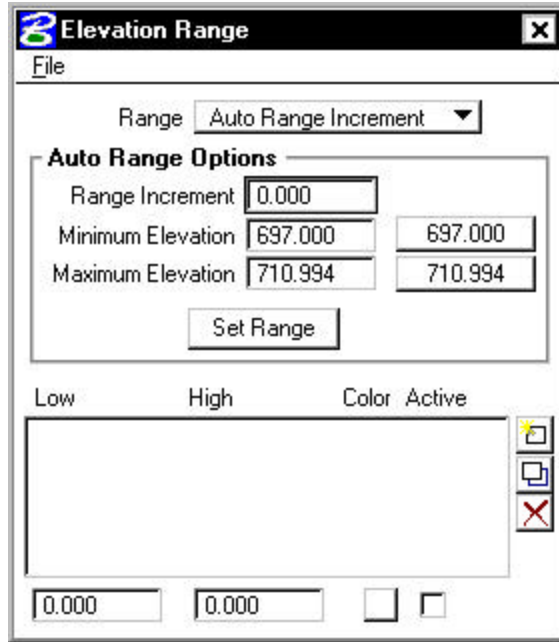
<b>TIN File</b>	Name of model for which themes are desired.
<b>Number of Grid Points</b>	To create gridded themes, specify the number of grid points. GEOPAK lattices the TIN model, based on the specified grid points, then generates themes for the lattice model.
<b>Display Only</b>	When activated, the themes are not drawn into the MicroStation file, and disappear when any view or update command is issued.
<b>Load Within Fence</b>	In lieu of analyzing an entire model, a MicroStation fence may be placed prior to processing and this toggle activated for partial model analyzing.
<b>Level, Weight, Style</b>	Element symbology of the themes. Note color is not an option, as it is utilized within the Preferences to distinguish the various ranges.
<b>Set Graphic Group</b>	When activated, all elements drawn in a single processing are placed in a graphic group for easy manipulation and deletion.
<b>Fill</b>	When activated, themes are color filled shapes. To view the shaded areas, ensure that the <b>Fill</b> toggle is active on the dialog invoked by selecting <b>Settings &gt; View Attributes</b> from the MicroStation tool bar. When not activated, the themes appear as MicroStation string elements
<b>Planarize at Elevation</b>	When activated, all shapes or line strings are drawn at the specified elevation, rather than the elevation of the TIN model.
<b>Polygonize Results</b>	When not activated, each triangle is outlined, as depicted in the example below. 

	<p>Note each triangle is outlined, regardless of its theme value. In the graphic below, the same model and theme ranges have been utilized. However, the <b>Polygonize Results</b> toggle was activated, therefore, each triangle is not outlined, but rather the area of common theme value is outlined in one shape.</p> 
<p><b>Set Range</b></p>	<p>Pressing this button invokes the dialog to set ranges and is detailed below.</p>
<p><b>Process</b></p>	<p>Commences the processing.</p>

The user may define an unlimited number of Range Values and Colors. A low and high value is defined for each range. If a theme is greater than or equal to the low value and less than the high value, the triangle or lattice is assigned the color for that range.

## 12.2 Set Ranges

Before the Themes processing commences, the user must define the desired ranges and associated colors. This is accomplished by pressing the **Set Range** button, which invokes the dialog depicted below.



The center of the dialog contains the list box, with edit fields directly below. Options are supported (button to the right of the list box) to **Add**, **Modify**, and **Delete** ranges. When the **Color Active** toggle is activated, the selected range is visible on the screen. A range can be activated or deactivated at any time during the processing by highlighting the desired line and changing the **Color Active** toggle. In this manner, the user has complete control over which ranges are visible on the screen at any one time.

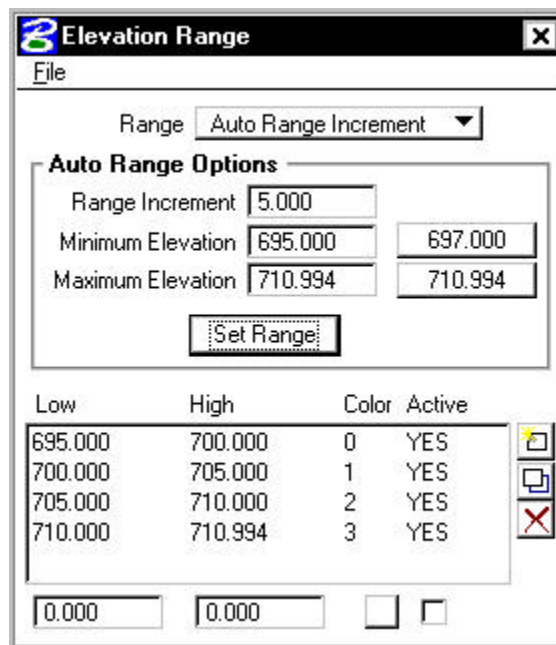
To add a single range, simply key in the desired values, select a color from the color picker, and press the **Add** button. The created line is added to the list box. To modify a line, highlight the desired line. The current values are displayed in the edit fields. Change the desired field, then press the **Modify** button. GEOPAK updates the list box. To delete a line, highlight the line and press the **Delete** button. The line is removed from the list box. An unlimited number of ranges are supported. When more than five ranges are specified, the scroll bar and arrows on the right side of the dialog are automatically invoked for easy scanning. Note the lines are displayed in ascending low value order, regardless of the order in which they were created.

The top of the dialog supports automatic creation of ranges. Two options are supported:

- **Auto Number of Ranges** - the number of ranges is specified, along with the Minimum and Maximum elevations (or slopes or aspects). GEOPAK divides the elevation into the specified number of ranges.

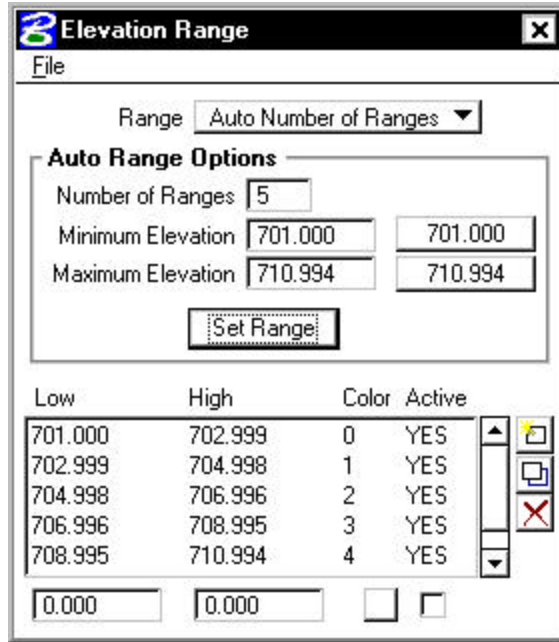
- **Auto Range Increment** - the range increment is specified, along with the Minimum and Maximum elevations (or slopes or aspects). GEOPAK divides the elevation into as many ranges as necessary at the specified increment.

For example, set the Range option to **Auto Range Increment**. Then set the **Range Increment** to 5, and the **Minimum** and **Maximum** elevations to 695 and 710.994 respectively. Note the two push buttons to the right of the elevations, which specify the **Minimum** and **Maximum Elevations** of the current Model / Object. By pressing one of the buttons, the value is populated within the Minimum of Maximum Elevation field without typing. To populate the list box with the specified ranges, press the **Set Range** button. The resultant dialog is depicted below.



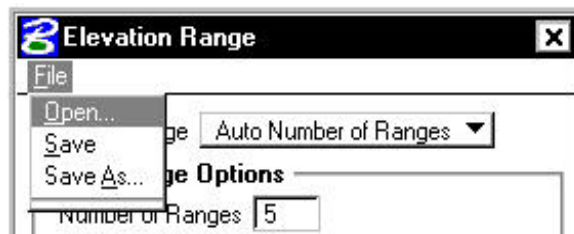
The **Range Increment** is added to the **Minimum Elevation** as many times as possible until the **Maximum Elevation** is attained. Note there are numerous ranges, however, each range is five master units (per our dialog specification.) Colors are assigned in order, commencing with color 0 and all **Color Active** toggles are defaulted on.

Now, change the Range to **Auto Number of Ranges**, and set the **Number of Ranges** to five. Leaving the **Minimum** and **Maximum Elevations** the same as the last example, press the **Set Range** button. The resultant dialog is depicted below.



In this case, GEOPAK computed the elevation difference, divided by the number of ranges, and computed the Low and High Elevations for each range. Note, there are only five ranges (the number specified in the dialog) in the list box, each 10 master units in range. Colors are assigned in order, commencing with color 0 and all color active toggles are defaulted on.

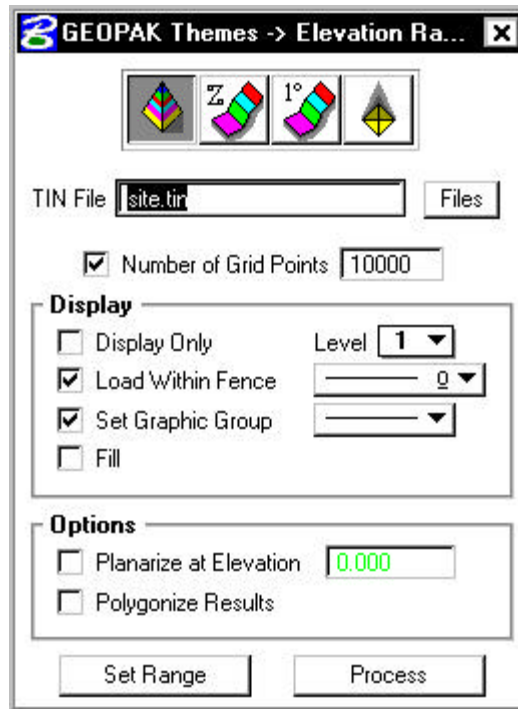
To utilize the specified ranges for subsequent sessions, several File functions are supported as depicted in the exploded view below.



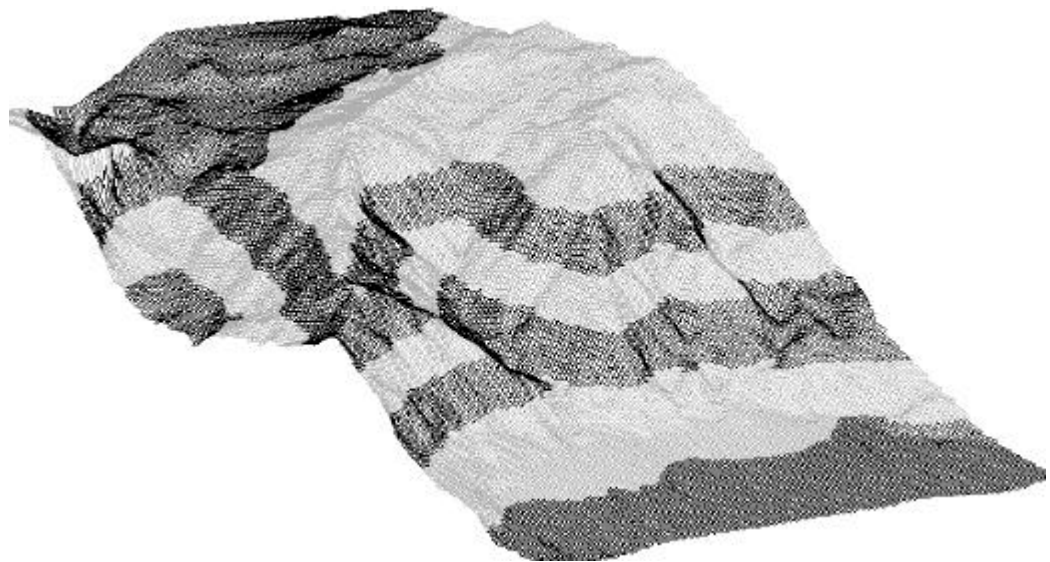
If the Theme Ranges file is not saved, the last set of Theme Ranges of the same Theme type (i.e., height, slope, or aspect) is utilized in subsequent sessions.

### 12.3 Elevation Themes Example

Height Themes reflect ranges of elevations. A sample Themes dialog for Elevation Ranges is depicted below.

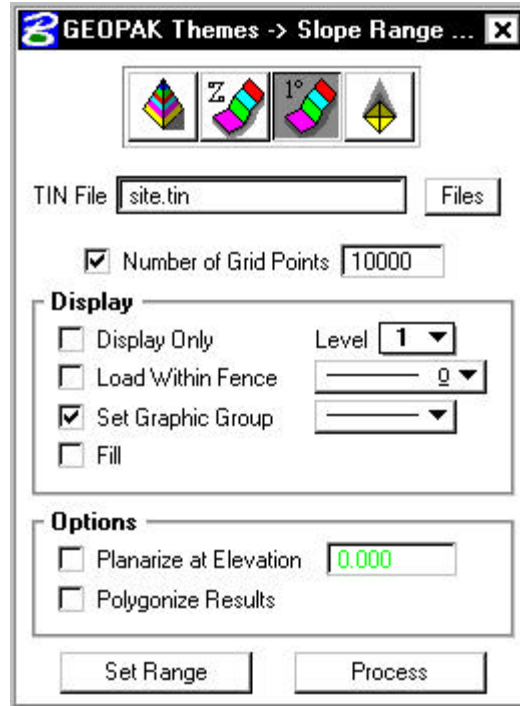


The graphic below depicts the resulting lattice image for the dialog depicted above.

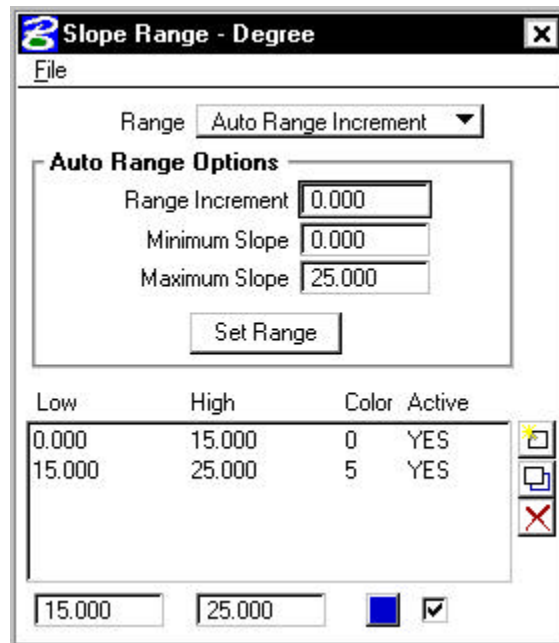


## 12.4 Slope Themes Example

Slope themes (in terms of **Percent** or **Degrees**) describe the angles of individual lattices or triangles. It is helpful to ascertain the more level and/or the steeper portions of the lattice or triangulated model. The main Themes dialog is set to Slope - Degrees and is depicted below. Note the title has changed to reflect the selection.



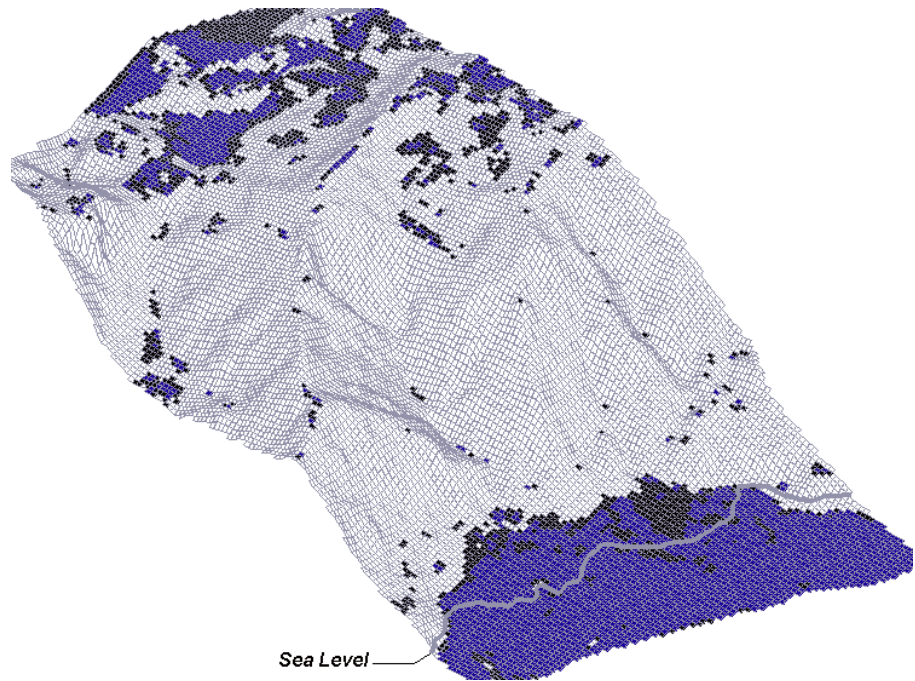
When the **Set Range** button was pressed, the dialog below was displayed.



In this instance, it is desired to identify the relatively level areas on the project site; defined in this case as those areas with a slope less than 25 degrees. Hence, two ranges are defined: from zero to 15 degrees and from 15 to 25 degrees in the Slope Ranges - Degree dialog above. The graphic below depicts the resulting lattice image for the dialog depicted



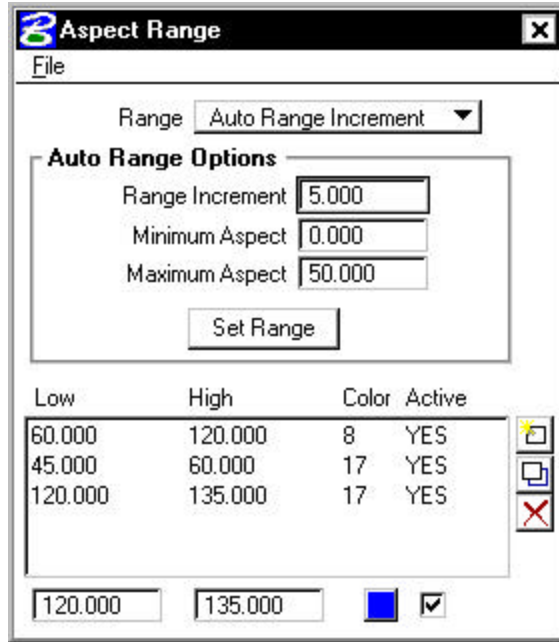
above. Note that any area not within the Themes ranges (i.e., more than 25 degrees are not filled).



## 12.5 Aspect Themes Example

Aspect Themes describe the direction that the triangle or lattice plane faces. Aspect ranges are expressed in degrees. The north axis is defined as zero degrees and angles increase in a clockwise direction. Therefore, zero degrees points north, 90 degrees points east, 180 degrees points south and 270 degrees points west. A level triangle is assigned a default aspect of 360 degrees.

The sample Aspect Ranges dialog below is intended to determine the portion of the triangle or lattice models that face east. Two color shadings are employed. The most direct easterly facings (60 to 120 degrees) are assigned one color. Less direct easterly facings (45 to 60 degrees and 120 to 135 degrees) are assigned another color.



The graphic below depicts the resulting lattice image for the dialog depicted above.

