Geometric Analysis

Surface Properties by Geometric Element

The Surface Properties by Geometric Element process (Geometric / Attributes / Surface Properties) computes surface property statistics from a surface raster for lines or polygons in a geometric object (vector, CAD, or

shape). You can choose to compute statistics on elevation, slope, aspect, and other surface properties. The statistics can be saved as tables added directly to the geometric object, as tables added to a copy of the object, or as text (CSV) files. Surface statistics can be tabulated using:

- all elements or only those marked in the process's View window
- individual elements and/or elements grouped ٠ by value in a designated attribute field.

Geometric Object Controls

Press the Select pushbutton in the Geometric Object box to select the geometric object to use. The selected object is automatically shown in the separate View window. Use the Elements icon buttons (Line or Polygon) to choose the element type to use for computing the properties. The Use radiobuttons to the right of these buttons set whether to use All elements or only those Marked in the View. Use the Output menu to choose how

View Tools Options HotKeys ☞ 🗆 였 Q Q 🦉 💥 🎲 🎥 🐸 +差 🎬 🛄 🎋 ∿ 🕶 🕗 🔶 🕂 👰 🖌 🖋 날 🖺 SEKI_fire_history_20 😾 Surface Properties by Geometric Eleme ، 🖬 😤 🖬 🖇 Geometric Object Select... SEKI_FIRE_CAD_2009_2012x.rvc / SEKI_fire_history_2009_2012a Elements 🖊 💋 Use 🦳 All 🔵 Marked Output Copy object and add table(s) 🕱 By Element 🛛 D/Name SEKI_fire_history_2013.GISNO 💌 By Attribute Choose... Select... NED10n37w119.rvc / grdn37w119_13 Volume reference elevation 0.00 Statistics Set All Clear All Elevation Minimum X Volume Below K Flevation Maximum X Volume Above W 118 41 20 N 36 38 02 Elevation Mean Border Elevation Mini K Elevation Std Dev Border Elevation Maximum In this example, surface properties are Slope Minimum Border Elevation Mean being computed by element for discrete 🕱 Slope Maximum Border Slope Minimum X Slope Mean polygons indicating areas burned by 🔟 Border Slope Maximum X Surface Area Border Slope Mean wildfires over a period of four years. A X Area Ratio Border Surface Length guery has been used to mark the larger 🗙 Area Coverage % Border Coverage % fire polygons (red) in the View, and only X Mean Aspect

Surface Properties - View 1

to save the statistics: Add table(s) to object, Copy object and add table(s), or Text file(s).

You can choose one or both of the By Element and By Attribute options. The By Element option compiles statistics independently for each element. With this option you can choose an ID or Name to embed in the statistics table(s) to identify each record. The choices are None, Element Number, [Element]_ID.Current (if the element has an ID table) and Choose; the latter option prompts you to select a database table and field associated with the polygons to provide the ID.

The By Attribute option tabulates statistics by grouping elements that have the same value in an attribute field you select. When you choose this option you are automatically prompted to select the table and field to use. You can press the Choose pushbutton to reset this choice if needed. The selected attribute is included as a field in the resulting statistics table.

Surface Controls

Use the Select button in the Surface box to choose an elevation or other continous surface raster from which to compile the surface properties. The surface object is automatically displayed in the View. You can enter an elevation value in the Volume reference elevation field to be used in conjunction with the Volume Below and Volume Above properties for polygons.

Statistics

The Statistics box lists the available statistical measures for the selected element type with a

checkbox allowing you to select or deselect each. Pushbuttons allow you to Set All or Clear All selections. For lines you can compute minimum, maximum, and mean values of elevation and slope, along with surface length and percent coverage. For polygons you can compute minimum, maximum, and mean values of elevation and slope, mean aspect, area percent coverage, and surface area. Two measures of surface roughness are provided: elevation standard deviation, and the area ratio (ratio of 3D surface area to 2D planimetric area). The Volume Above and Volume Below options compute volumes relative to the specified reference elevation. The various Border options compile line statistics using the borders of the polygons. You can choose the units to use for the surface

K Elevation Minimum Slone Minimum 🕅 Elevation Maximum 🕅 Slope Maximum 🕅 Slope Mean K Elevation Mean Surface Length Coverage % Surface statistics available for line elements.

property measures by pressing the Preferences icon button and choosing Units to open the Units window (see illustration to the right). The Save parameter table option on the Preferences menu saves a table recording the volume reference elevation when you compute the Volume Above or Volume below measures.



Press the Preferences icon button and choose Units to choose surface measurement units.



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the marked polygons are set to be used.

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Value

2010039

1241.44

2804.39

-8.99

301.36

0.05

374.74

54.19

41.87

1.14

100.00 -14.24

1242.36

2117.15

Single-record view of resulting surface

Units

km

unity

deg

14/32 records in table

Table Edit Record

Elevation Minimum

Elevation_Maximum

levation_Mean

Elevation_Std_De

Slope_Minimum

Slope_Maximum

Area_Coverage_Pc

0 elements attached

Border_Elevation_Minimum

Border_Elevation_Maximum 2804.02 Border Elevation Mean

Slope_Mean

Surface Area

Mean_Aspect

Area_Ratio

Name

GISNO

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