

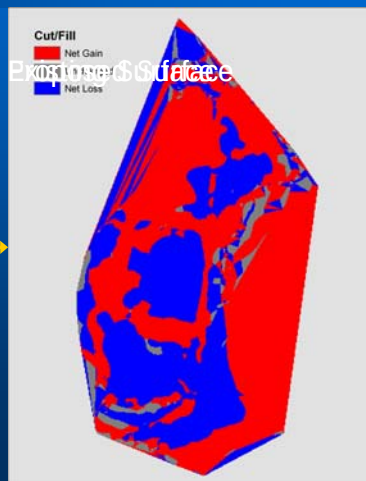
Increasing Workflow Efficiency In Cut/Fill Analysis

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Geog 590

Cut/Fill Analysis

Attributes of Cut/Fill				
Rowid	VALUE	COUNT	VOLUME	AREA
0	1	6	0	24
1	2	108	-3.8931884765625	432
2	3	1	0	4
3	4	4667	7959.451171875	18668
4	5	119	0	476
5	6	1	-0.0826418015625	4
6	7	18	0	72
7	8	1	0.2454833984375	4
8	9	1	-0.1290283203125	4
9	10	1	0.24580546875	4
10	11	1	-0.1290283203125	4
11	12	2	0.4144287109375	8
12	13	1	-0.1292724609375	4
13	14	1	-0.100341796875	4
14	15	1	-0.129150390625	4
15	16	1	0	4
16	17	1	0	4
17	18	5	0	20
18	19	1	-0.0086669921875	4
19	20	63	0	252
20	21	1	1.177001953125	4
21	22	1	-0.016357421875	4
22	23	1	-0.2322998046875	4
23	24	120	0	480
24	25	1	-1.128173828125	4
25	26	1	-0.2164306640625	4
26	27	18	0	72
27	28	1	-1.2678984375	4

- Proposed Surface

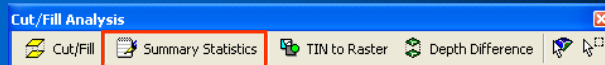


Purpose



- Calculate Summary Statistics
- Calculate Difference in Elevation (i.e. Depth)
- Retrieve Pixel Value
- Calculate Average Pixel Value & Area by Polygon Extent

...still in progress

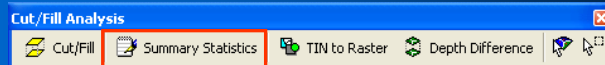


User's Guide

- Designed for default Cut/Fill output
- Must be a Raster
- Must contain an attributes table
- Table must "Volume & Area" fields

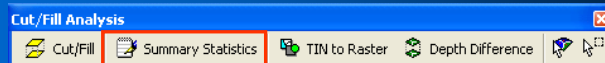
A screenshot of a dialog box titled 'Summary Statistics'. It contains the following elements:

- A text label: 'Calculates summary statistics on the output raster of Cut/Fill.'
- A 'Volume Raster:' label followed by a dropdown menu showing 'Cut/Fill' and a folder icon.
- Two columns of labels: 'Volume:' and 'Area:'.
- Input fields for 'Total Cut:', 'Total Fill:', 'Cut:', and 'Fill:'.
- A 'Cut/Fill Result:' label followed by an input field.
- A 'Calculate Statistics' button.
- A 'Done' button at the bottom.



Accessing and Selecting the Input File

- GxDialog → IGxDialog (properties of the dialog box)
- EnumObject → IEnumGXObject (enumerate through GxObjects)
- GXDataset → IGXDataset (manage properties of a GX dataset object)
- File → IGXFile (manages a file object)
- RasterLayer → IRasterLayer (create/modify a raster layer)
- GX Object → IGXObjectFilter (defines a GxObject filter)



Accessing Raster attribute field and calculating summary statistics

- Raster → IRaster (control in-memory raster)
- Raster → IRasterBandCollection (control a collection of RasterBands)
- RasterBand (CC) → IRasterBand (control a raster band object)
- Table → ITable (return information about and manage tables)
- Cursor → ICursor (hand out enumerated rows, field collections and allows for the updating, deleting and inserting of rows)
- Row → IRow (return information about the row, the table the row belongs to and storing and deleting the row)

Cut/Fill Analysis

Cut/Fill Summary Statistics TIN to Raster Depth Difference

User's Guide

- Replicates ArcToolbox Minus tool
- Rasters must have same cell size
- Intended to calculate "depth raster"

Depth Difference

Calculates difference between existing and proposed surface.

Existing Raster: grid_base

Proposed Raster: grid_regrade

Output Raster:

OK Cancel

Cut/Fill Analysis

Cut/Fill Summary Statistics TIN to Raster Depth Difference

Accessing and Selecting the Input File

- IGxDialog
- IEnumGXObject
- IGXDataset
- IGXFile
- IRasterLayer
- IGXObjectFilter
- * Geoprocessor
 - executes geoprocessor tool: Spatial Analyst/Math/Minus tool)

Depth Difference

Calculates difference between existing and proposed surface.

Existing Raster: grid_base

Proposed Raster: grid_regrade

Output Raster:

OK Cancel

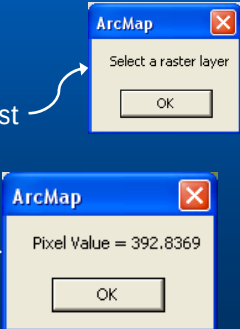
Cut/Fill Analysis

Cut/Fill Summary Statistics TIN to Raster Depth Difference

Retrieve Pixel Value Tool

User's Guide

- Intended only for a Raster
- Raster in TOC must be selected first
- Returns only pixel value



The workflow involves two ArcMap dialog boxes. The first, titled 'Select a raster layer', has an 'OK' button. The second, titled 'Pixel Value = 392.8369', also has an 'OK' button. Arrows from the list items point to these dialog boxes: 'Raster in TOC must be selected first' points to the first dialog, and 'Returns only pixel value' points to the second.

Cut/Fill Analysis

Cut/Fill Summary Statistics TIN to Raster Depth Difference

- MxDocument → IMxDocument (control the Mx Document)
- Point → IPoint (define the dimensional points)
- Geometry → IGeometry (describes the properties of all geometric objects)
- Layer → ILayer (work in all layers)
- RasterLayer (CC) → IRasterLayer (create or modify a raster layer)
- Raster → IRasterBandCollection (control a collection of RasterBands)
- RasterBand (CC) → IRawPixels (control pixel reading and writing from RasterBand)
- Raster (CC) → IRasterProps (control the most common raster properties)
- Pnt → IPnt (control a portable point)
- PixelBlock (CC) → IPixelBlock3 (controls a PixelBlock)
- RasterGeometryProc → IRasterGeometryProc2 (allows raster geometry processing)

Sources

- Chang, Kang-Tsung. 2008. *Programming ArcObjects with VBA*. New York: CRC Press.
- ESRI. ArcScripts, ESRI Developer Network, Online Help. www.esri.com.
- Duh, Geoffrey