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Technical Workshops | July 13, 2011

Analysis and Geoprocessing

3D Analyst: Feature and Volumetric Analysis

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Workshop Outline

- **Introduction**
- **Demonstrations**
 - **Sub-surface Analysis**
 - **Volumetric Analysis**
 - **Line-of-sight Analysis**
 - **Shadow Analysis**
- **Conclusion**
- **Questions & Answers**

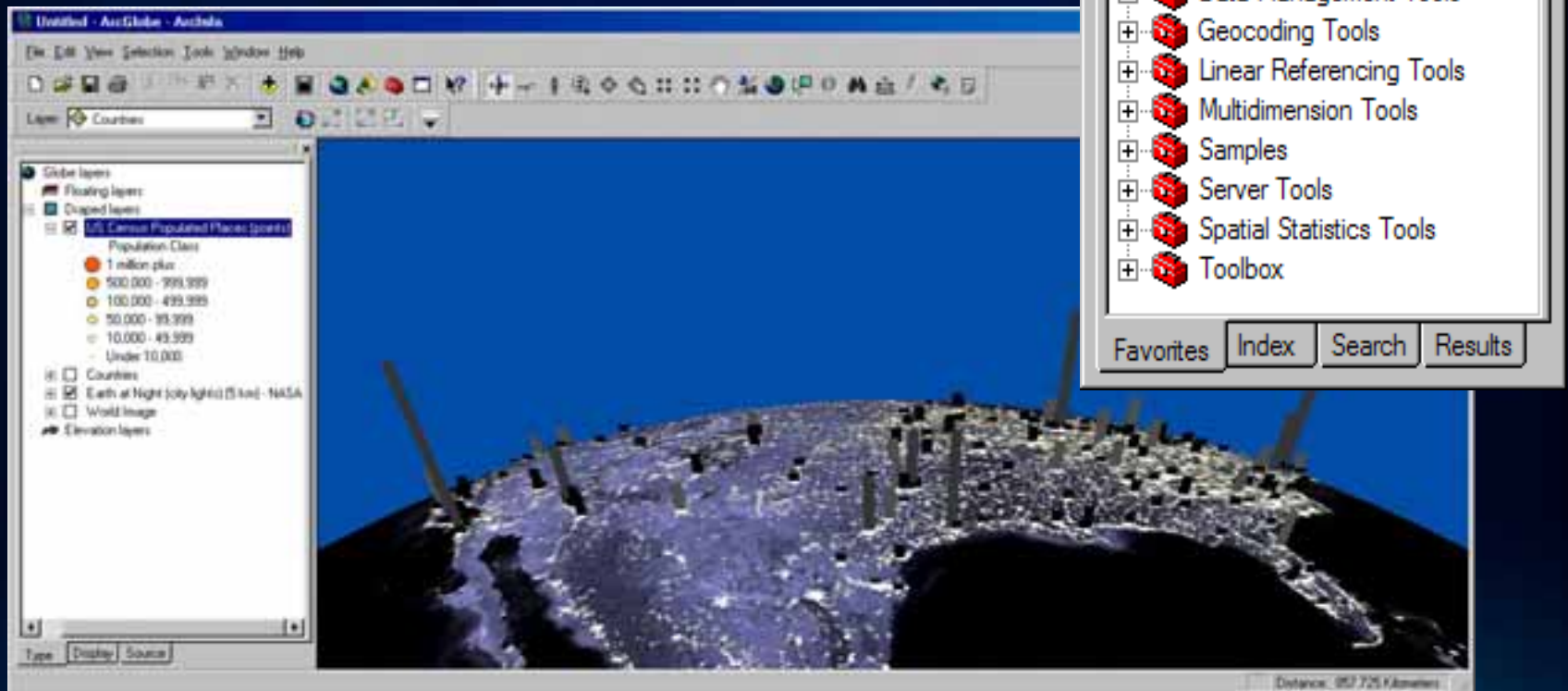
Introduction to 3D GeoProcessing

3D Analyst Components

- **3D Visualization App Programs**
 - ArcScene
 - ArcGlobe
- **3D Analysis - GeoProcessing:**
 - Surface Analysis
 - Conversions
 - Feature-oriented Analysis (new at 10)

Why 3D GeoProcessing?

- Prepare data for visualization/analysis
- Performing surface/feature 3D analysis
- Batch/non-interactive data processing



Different Ways to Run GP Tools

1. Graphical Tool Dialog

- New additions at 10

2. In-App Python Window

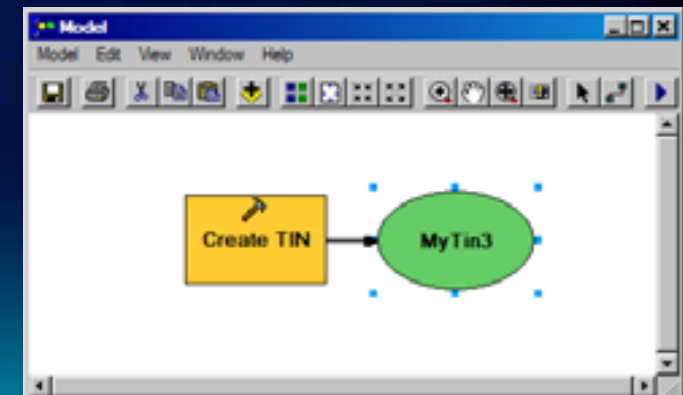
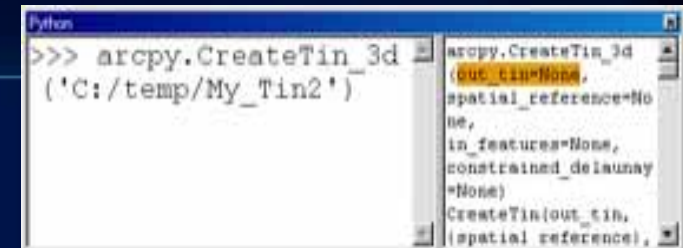
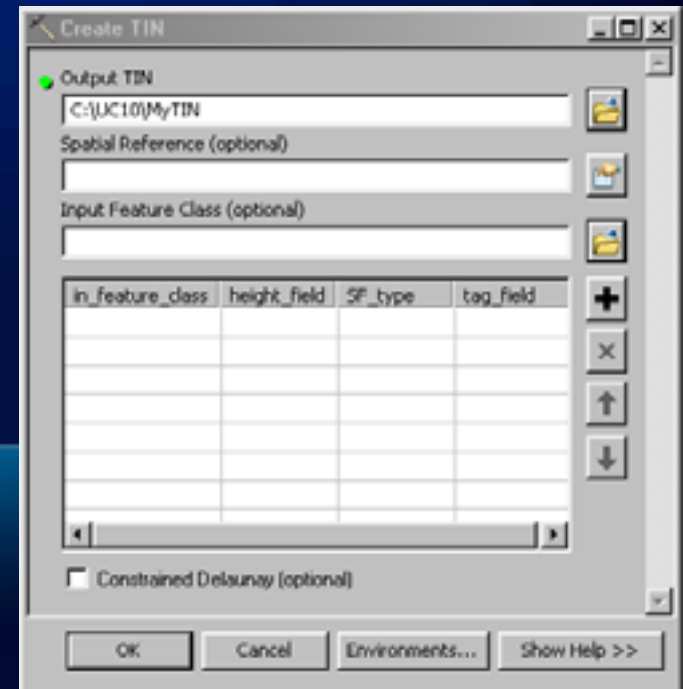
- Replacing command line

3. Model Builder

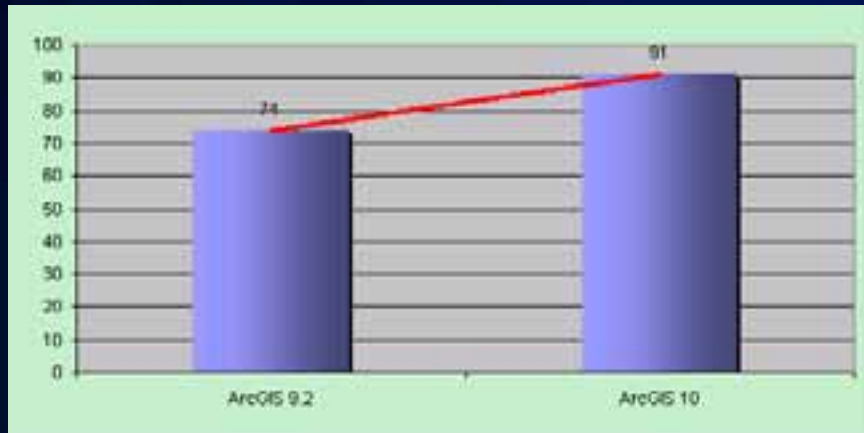
4. Scripting

Python 2.6.5 with arcpy module:

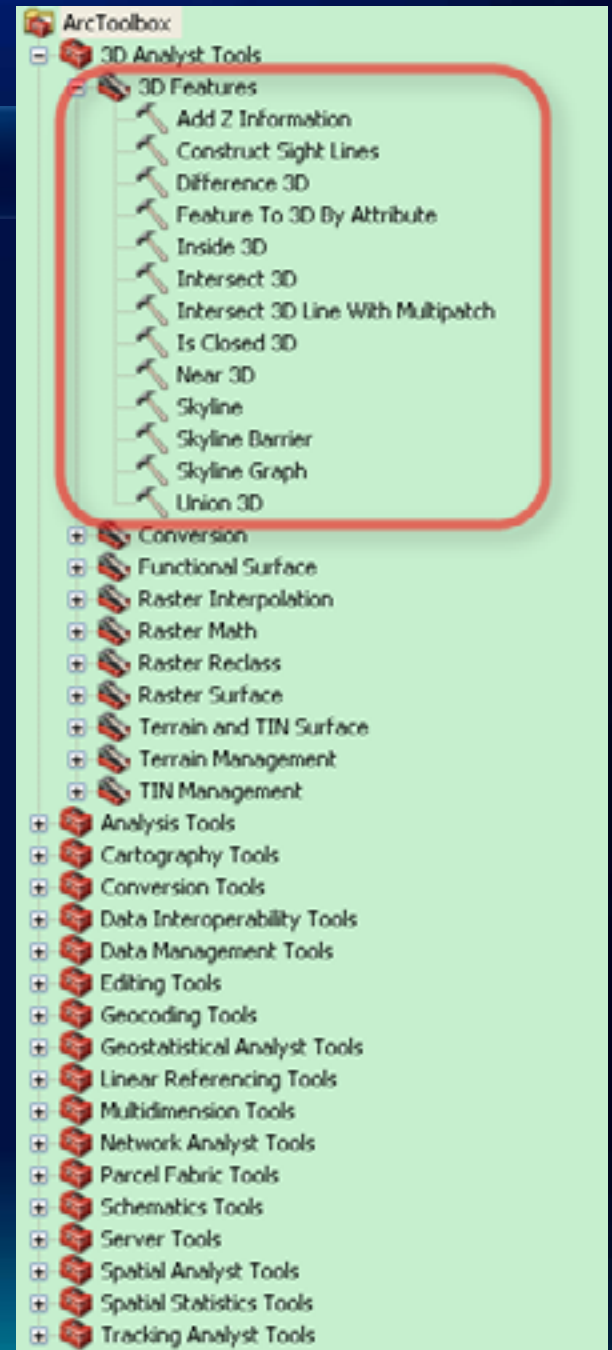
```
>>> import arcpy
>>> arcpy.CheckOutExtension('3D')
>>> arcpy.env.workspace = 'C:/UC10/'
>>> arcpy.CreateTin_3d('MyTin4')
```



What's New at 10?



- 27 new tools added
- 9 old tools deprecated
- 91 tools total
- New toolset: 3D Features
 - True 3D analysis
 - Skyline suite of tools



3D Features Toolset

- **True 3D Analysis Tools**

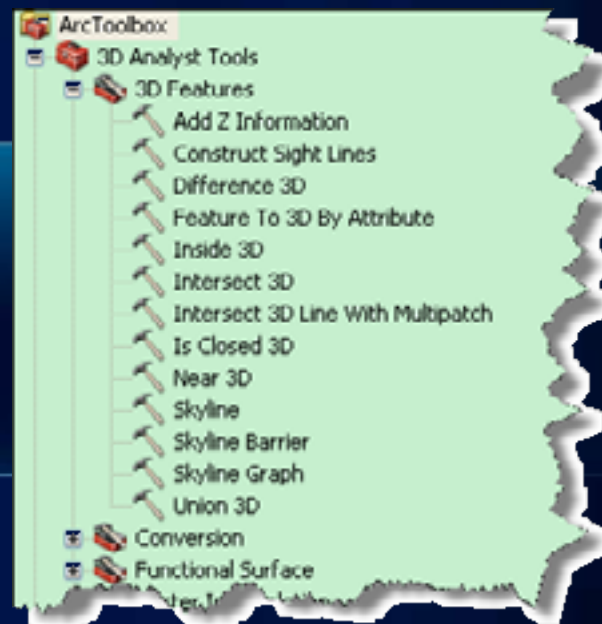
- Difference 3D
- Inside 3D
- **Intersect 3D**
- **Intersect 3D Line with Multipatch**
- Is Closed 3D
- Near 3D
- Union 3D

- **Skyline Analysis Tools**

- **Skyline**
- **Skyline Barrier**
- Skyline Graph

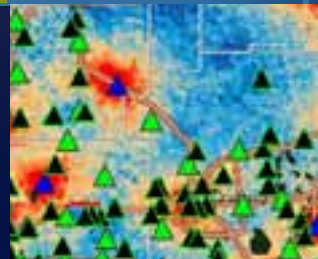
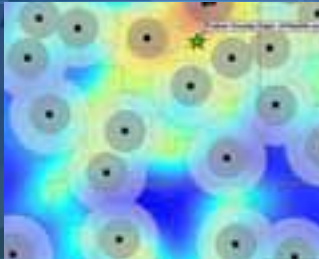
- **Others**

- Add Z Information
- **Construct Sight Lines**
- Feature to 3D by Attribute



Demo 1: Sub-surface Analysis

Extrude Between
Intersect 3D



Fulton County Dept. of Health and Wellness/District 3, Unit 2, 04/11/2011

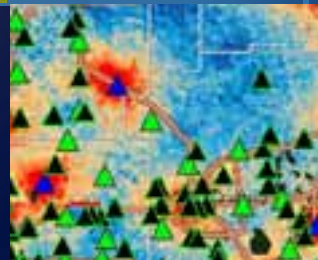
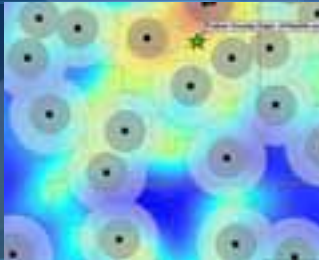
DeKalb County Board

Demo 2: Volumetric Analysis

Skyline

Skyline Barrier

Intersect 3D Line

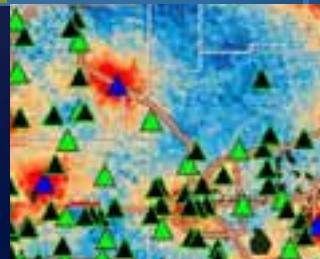


Demo 3: Line-of-sight Analysis

Construct Sight Line

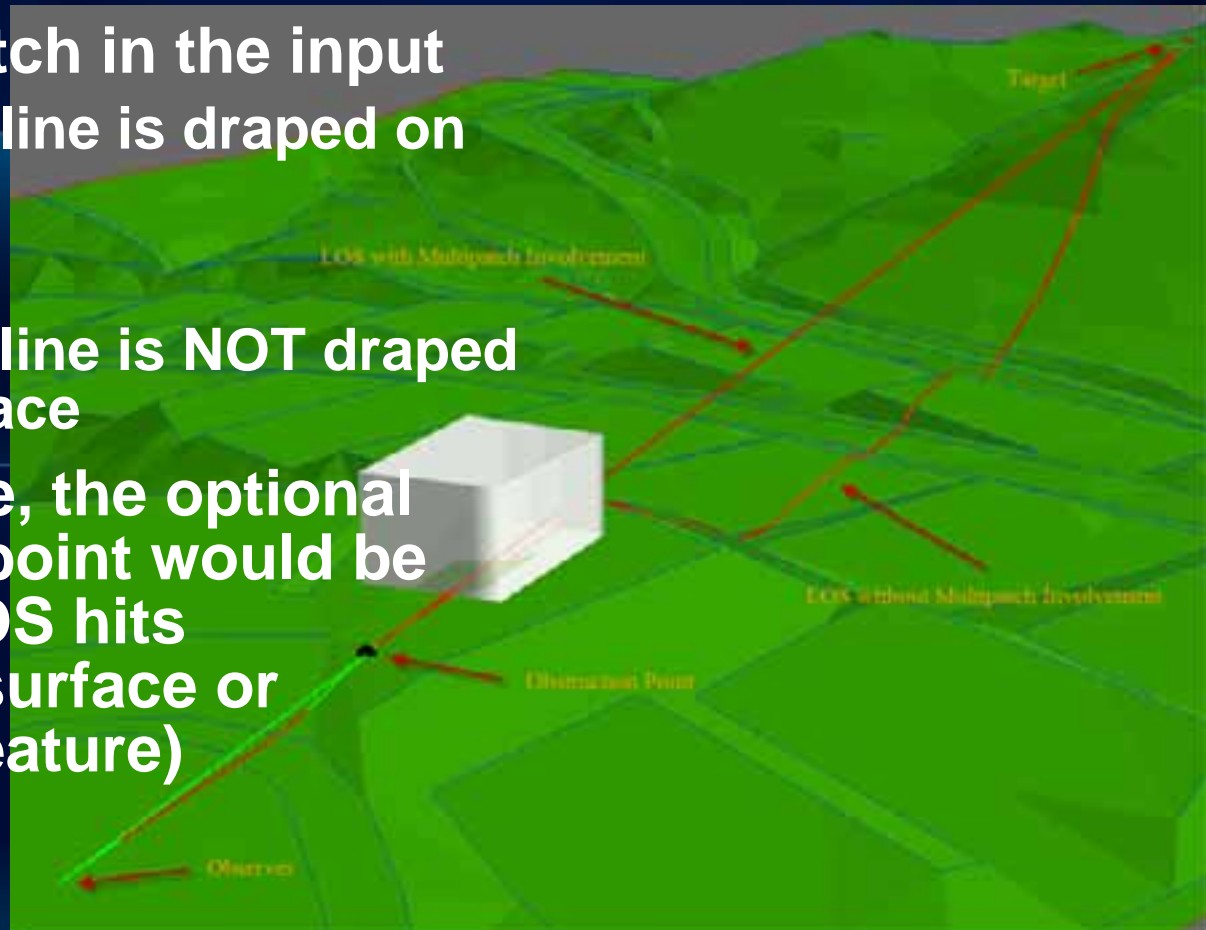
Line of Sight

Add Z Information



Two Modes of the Line of Sight Tool

- If no multipatch in the input
 - The output line is draped on the surface
- Otherwise
 - The output line is NOT draped on the surface
- In either case, the optional obstruction point would be where the LOS hits something (surface or multipatch feature)



DeKalb County Board

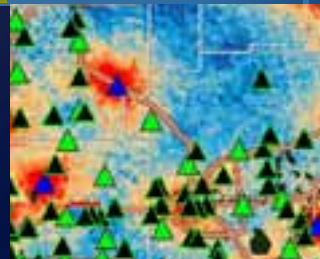
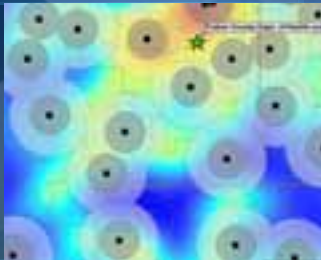
Fulton County Dept. of Health and Wellness/District 3, Unit 2, 04

Demo 4: Shadow Analysis

Skyline

Intersect 3D

Inside 3D



3D Data Types

	Vector	Raster
Surface	TIN/Terrain	Grid/DEM
Feature	Point/Line/Polygon	
	Multipatch	

Questions:

1. What's special about multipatch?
2. Which data type is true 3D or close to it?

Summary New 3D GeoProcessing Tools

- True 3D analysis capability
- Sophisticated virtual city analysis & visualization tool
- Flexible and versatile use scenarios
- Examples showed:
 - Sub-surface analysis
 - Volume analysis
 - Line of sight analysis
 - Shadow analysis



Questions & Answers

3D GIS Resource Center:

<http://resources.arcgis.com/content/3dgis/10.0/about>



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