3D Analyst – An Introduction

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Why use 3D GIS?

Because our world is 3D

Improve understanding
3D is easy for everyone to understand

Solve 3D problems
Some spatial problems can only be solved in 3D

Better communication
3D makes it easier to articulate ideas
What can you do with ArcGIS 3D?

- Multiscale 3D Models
- Surface modeling
- 3D Analysis
- Native lidar support
- Share 3D scenes
- ArcGIS for 3D Cities
- 3D Geodesign
- Integrated 3D
- 3D Analysis
Contents

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- ArcGlobe
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What is 3D Analyst?

- ArcGIS extension that provides capabilities for:
  - Interactive 3D Visualization of spatial data
  - 3D Editing of feature data
  - 3D Geoprocessing tools
  - Publish globe services (ArcGIS Server)
  - Publish globe documents (Publisher toolbar) for use in ArcReader
  - Export ArcScene documents to 3D web scenes
Applications with 3D Functionality

ArcGlobe

ArcScene

ArcMap

ArcCatalog
Data Types

• Vector features
  • Points, lines, polygons, multipatches

• Surface types
  • Triangular Irregular Networks (TINs)
  • Rasters
  • Terrain datasets
  • LAS datasets
ArcGlobe

• 3D visualization application
  • Data placed on 3D globe
  • Map like & oblique views

• Integrated topography
  • One logical ‘globe surface’
  • One multi-resolution mesh

• Caching
  • Disk cache and memory cache
  • Levels-of-detail (raster data)
ArcGlobe: **Levels-of-detail**

- **Far** (less detail)
- **Near** (more detail)
ArcGlobe: **Types of layers**

- **Elevation**
  - defines globe surface
- **Draped**
  - relative to globe surface
- **Floating**
  - Not relative to globe surface
ArcGlobe: Navigation Modes

Global mode

Surface mode
ArcScene

- 3D visualization application
- Memory based application
- Better for smaller study areas
- Stereo viewing is supported
- Export to 3D web scene (.3ws)
3D Effects Toolbar

• Real-time feedback for
  • Transparency
  • Front/backface culling
  • Lighting
  • Depth priority (ArcScene only)
  • Swipe tool (ArcGlobe only)
  • Flicker tool (ArcGlobe only)
3D Symbology

- Applied to feature data
- Add realism to your documents
- Match to symbols in style
### 3D Styles

**Points**
- 3D Geometric primitives: Spheres, Cones, etc.
- 3D Models: Street furniture, Houses, etc.
- 3D Character Markers
- Import 3D models –
  - OpenFlight (*.flt), 3DS Max (*.3ds), Virtual Reality Markup Language (*.vrml), and SketchUp (*.skp), Collada (*.dae) models

**Lines**
- 3D Texture Line Symbols: Pavement, Concrete, etc.
- 3D Geometric primitives (ArcScene): Tube, Strip, Wall etc.

**Polygons**
- 3D Texture Fill Symbols: grass texture...
3D Editing

- Feature editing in ArcGlobe and ArcScene
- Template based editing
- Support for snapping
3D Graphics and KML support

• 3D Graphics Toolbar
  • Digitize point, line, polygons and text graphics
  • Apply 3D Symbology to the graphic elements

• Keyhole MarkUp Language (ArcGlobe only)
  • Add KML data using the KML toolbar in ArcGlobe
Animation Tools
Customization framework

• Customization environments
  - Visual Basic for Applications (VBA) in ArcGlobe and ArcScene applications
  - C#, VB.NET, Java, C++, etc.

• GlobeControl and SceneControl
  - Used in custom applications
  - Can easily view existing documents
3D Geoprocessing

- Surface creation
- Surface analysis
- Output raster and vector datasets
- 3D feature creation
- Data Conversion
- CityEngine toolset *(new in 10.2)*
Features From CityEngine Rules

- Creates 3D geometries
- Uses CityEngine rules

Technical workshop:

3D Analyst: Working with 3D Analyst and CityEngine
Where: Room 09
When: Tuesday (07/09) at 1:30PM
Export to 3D Web Scene

- Export ArcScene documents
- Upload to ArcGIS Online
- No plug-in required
- View in browser
  - Firefox, Chrome etc.
- Whitepaper (coming soon)
Demo