



GIS Utilities: Create a 3D Image Visualization



Using the BARC for BAER Support

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Assumptions of Creating a 3D Image Visualization:

- 1) **A DEM for your project area.** Ensure that the extent of the DEM covers your entire project area.
- 2) **Your Image must be terrain corrected**
- 3) **Your DEM and Image must have the same projection and coordinate system.**

The Add Data button



Vertical Exaggeration:

Background color:

These graphics illustrate the suggested **Scene Properties** parameters of the **General** tab (above) and the **Illumination** tab (right).

Objective

- To create a 3D image visualization.

Required Data

- A DEM (Digital Elevation Model), a post-fire satellite image, and your final burn severity raster layer

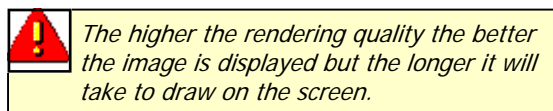
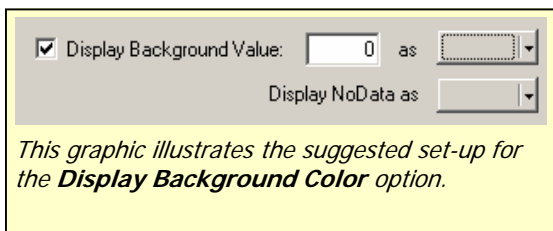
Introduction and Overview of Procedure Steps

Three-dimensional (3D) image visualizations are tools used to enhance an image's visual interpretability and illustrate the effects of terrain. The goal of this document is to describe how to create a 3D Image Visualization using ArcScene.

1. Load Data and Set-Up Data Frame Parameters
2. Set-up DEM and Image Parameters
3. Inspect the 3D Image Visualization
4. Perform a 3D Fly-by
5. Save the 3D Drape to a Graphic

I. Load Data and Set-up Data Frame Parameters

1. Launch **ArcScene** from the **Start** menu (**Start** | **Programs** | **ArcGIS** | **ArcScene**).
2. Click the **Add Data** button from **ArcScene's Standard** toolbar.
3. Load the following files:
 - **hayman_20020623_30m_utm.img**
 - **hayman_dem_30m_utm_final.img**
 - **haymansoilbs** —> *This is your final burn severity layer created in this course*
4. Ensure that the added layers have checkmarks next to them in ArcMap's Table of Contents.
5. Double-click on **Scene Layers** in the **Table of Contents** and the **Scene Properties** will open.
6. Select the **General** tab from the **Scene Properties** dialog. Set the following parameters:
 - **Vertical Exaggeration:** *Type in 2*
 - **Background Color:** *Black*
7. Select the **Illumination** tab from the **Scene Properties** dialog. Set the following parameters:
 - **Azimuth:** *315*
 - **Altitude:** *30*
 - **Contrast:** *50*
 - Select **Apply**, and then **OK** to close the dialog



II. Set-up DEM and Image Parameters

1. Check the check box associated with your **DEM** in the **Table of Contents**—this will turn off the display of your **DEM** in the **Data View**.
2. Double-click your **Image** in the **Table of Contents**.
3. Select the **Base Heights** tab from the **Layer Properties** dialog. Set the following parameters:
 - Enable the **Obtain heights for a layer from surface** radio button and set the associated directory to your **DEM**
 - **Offset:** 0
4. Select the **Symbology** tab from the **Layer Properties** dialog. Set the following parameters:
 - Enable the **Display Background Value**. If necessary, click the pulldown arrow from its associated **Color Box**, and select *No Color* from **Color Palette** (see graphic to the left)
 - Choose band combination RGB = 6,4,3.
5. Select the **Rendering** tab from the **Layer Properties** dialog. Set the following parameters:
 - Adjust **Quality enhancement for raster images** to *medium-high* (adjust slider bar as necessary)
 - Select **Apply**, and then **OK** to close the dialog.
6. Double-click your **Burn Severity** layer in the **Table of Contents**.
7. Click the **Base Heights** tab and set the following:
 - **Obtain layer heights from surface:** *Set to your DEM*
 - **Offset:** 20
8. **Symbolize** the severity classes from dark green (unburned) to red (high) and your water and unknown classes.
9. Select the **Rendering** tab from the **Layer Properties** dialog. Set the following parameters:
 - Adjust **Quality enhancement for raster images** to *medium-high* (adjust slider bar as necessary)
10. Select **Apply**, and then **OK** to close the dialog.

III. Inspect the 3D Image Visualization

1. Use the **Pan**, **Zoom**, and **Navigate** buttons from **ArcScene's Tools** toolbar to inspect the 3D image visualization in the **Data View** (see graphic on next page).
2. Experiment by changing the suggested **Data Frame**, **DEM**, and **Image** parameters from sections one and two.

IV. Perform a 3D Fly-by

1. Select the **Fly** button from **ArcScene's Tools** toolbar (see graphic to the left).
2. Move your cursor over the **Data View**. The cursor should change to a 'standing bird'.



These graphics illustrate some commonly used buttons (tools) from **ArcScene's Tools** toolbar to inspect 3D Image Visualizations.

3. Left-click over the center of the image. The cursor should change to a 'flying bird', and it will slowly zoom towards the image—use your cursor to navigate.
4. Use the following controls to help navigate the 3D Fly-by:
 - Use the **Cursor** (alternatively, the **Arrow Keys**) to *navigate the fly-by*
 - **Left-Click** (alternatively, the **Page Up Key**): *increases speed of fly-by*
 - **Right-Click** (alternatively, the **Page Down Key**): *decreases speed of fly-by*
 - **Hold Shift Key** to 'hover' while in flight
 - **ESC Key**: *stops fly-by*
5. Modify scene and image parameters (if you wish) and perform the 3D Fly-by again.

V. Export the Scene to a Graphic

1. Adjust the scene to a perspective you like.
2. Go to **File | Export Scene | 2D...**
3. Choose JPG or TIFF as the file type.
4. Browse to an appropriate folder to save the image to and name an output.
5. Press **Save**.