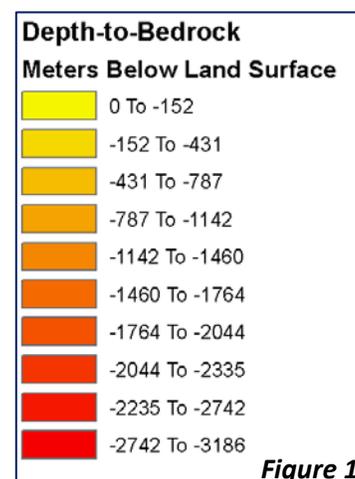


Safford Basin Bedrock 3D GeoPDF

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The Safford 3D GeoPDF illustrates the basin configuration and depths for the Safford Basin and was a collaborative effort between the Arizona Geological Survey (AZGS) and the Arizona Department of Water Resources (ADWR). There were three major steps for creating the 3D Geo PDF:

1. Create a modified Digital Elevation Model (DEM) incorporating AZGS depth-to-bedrock data for the Safford Basin (Gootee, 2012) that was modified from previous AZGS depth-to-bedrock data (Richard et al, 2007). The depth-to-bedrock raster was created by subtracting the United States Geological Survey (USGS) 30-meter DEM from the AZGS bedrock elevations, producing negative values. A constant value raster (value of zero) was created so that all rasters had the same extent for raster calculations. The depth-to-bedrock raster was merged with the constant value raster. The modified constant value raster was then added to the 30-meter DEM, creating a modified DEM with bedrock elevations in the Safford Basin.
2. Create a suitable view to illustrate depth-to-bedrock configuration and depth variations in the Safford Basin. ArcGIS (ESRI, 2011) was used to apply an equal color ramp (yellow to red) to the depth-to-bedrock raster to symbolize the intervals of bedrock depths (Figure 1). The depth-to-bedrock raster was overlaid on a 30-meter hill shade (derived from DEM) and the final view was exported as a GeoTiff and then imported into ArcScene (ESRI, 2011). The exported GeoTiff and the elevation data from the modified DEM from step 1 were combined and vertically exaggerated 3 times in ArcScene, creating a 3D enhanced view. The 3D enhanced ArcScene view was exported as a 3D .wrl file, serving as the view for the final product.
3. Create the 3D GeoPDF. The exported 3D .wrl file was imported into Adobe Acrobat Professional (Adobe Systems, Inc, 2011) using Tetra4D 3D PDF Converter (Tetra4D, 2011) and Terra Go PDF Composer (Terra Go Technologies, 2011). The PDF was geo-registered using the Terra Go software and the coordinates from the modified DEM, creating the Safford Depth-to-Bedrock 3D GeoPDF. The 3D GeoPDF uses UTM NAD 83 coordinates and the elevations are in meters. When the GeoPDF is opened, a limited Terra Go Toolbar will become visible. It is recommended that the user download the full Terra Go toolbar to be able to view the cursor location and elevation data from: <http://www.terragotech.com/products/terrago-toolbarReferences>



Adobe Systems, Inc., 2011. Adobe Acrobat Professional.

ESRI, 2011. ArcGIS ArcMap and ArcScene.

Gootee, B.F., 2012, Geologic Evaluation of the Safford Basin for Carbon Dioxide Sequestration Potential. Arizona Geological Survey; Tucson, Arizona; OFR-12-01.

Richard, S.M., Shipman, T.C., Greene, L.C., and Harris, R.C., 2007, Estimated depth to bedrock in Arizona, v 1.0; Arizona Geological Survey; Tucson, Arizona; DGM-52.

Terra Go Technologies, 2011. 3D Composer.

Tetra4D, 2011. 3D PDF Converter.



