

Getting Started

Using Image Data in ArcView GIS

By Monica Pratt, ArcUser Editor

ArcView GIS can use images in several ways. Images such as photographs or scanned documents can be linked to features in a theme so that clicking on the feature with the Hot Link tool displays the image. Images can also be added to an ArcView GIS project as themes. Often these images are scanned maps, aerial photographs, or satellite images. If an image contains information that allows it to be registered in geographic space, the image can be used to enhance the display of feature data, such as roads or other infrastructure, or can be used for visually verifying or updating feature data. Core functionality in ArcView GIS supports the use of image files in the following formats: BSQ (Band SeQuential), BIL (Band-Interleaved-by-Line), BIP (Band-Interleaved-by-Point), BMP, Sun raster, TIFF (Tag Image File Format) exclusive of version 6.0, and GeoTIFF files.

Adding Image Data Sources

Adding image data to a project is very simple.

1. Open a new or existing project, create or open a View.
2. Choose View > Add Theme or click on the Add Theme button in the toolbar.
3. In the Add Theme dialog box, change the Data Source Type from Feature Data Source to Image Data Source.
4. Navigate to the location of the desired file and select it. Click OK to add the image as a theme and exit the dialog box.

The image appears in the legend as a new theme. Click on the box next to the theme name to draw it in the View.

If the image is large, you may want to display only a portion of it. Choose Theme > Properties to bring up the Theme Properties dialog box. Click on Definition in the left column. On the right, the Extent Limit will be set to image default. However, the extent of the theme (area of the theme displayed) can be changed to the extent of the image inside the current View; the full extent of the themes in a View; the extent of another theme in the View; or specific coordinates for left, right, top, and bottom that are entered in the dialog box.

Registering Images in Geographic Space

Feature data sources such as shapefiles are stored in real-world x,y coordinates. The origin for the x and y axes is located in the lower left

corner. The pixels that make up image data are stored in rows and columns that are referenced to an origin located in the upper left corner. In order to successfully overlay image and feature data for the same area, images must be georeferenced. Georeferenced files provide ArcView GIS with the information required to transform image coordinates to real-world coordinates. Georeferencing information can be contained in a header file for the image or stored in a separate ASCII (text) file called a world file.

ArcView GIS displays an image “as is.” If the image was created in a projection, it will be displayed in that projection and will not be affected by any projection assigned to the View. The projection specified in the View should match the image’s projection so that feature data themes will line up reasonably well with the image. Information about the projection of an image file is generally available from the agency or vendor that supplied the file.

Displaying Image Data Using Extensions

ArcView GIS ships with 10 extensions that allow you to view and use various kinds of data in ArcView GIS projects. Extensions are programs that provide ArcView GIS with specialized capabilities. Tools, data, and customized work environments can be shared easily using extensions. A variety of extensions come with ArcView GIS. Many extensions are included in the core product, while others are available as sample extensions. Extensions such as ArcView 3D Analyst provide a whole suite of tools and can be purchased separately. Custom extensions can be written using Avenue, the programming language that comes with ArcView GIS. Many useful extensions written by users can be downloaded at no charge from the ESRI Web site on the ArcScripts page (www.esri.com/arcscripts).

Extensions can be loaded (or unloaded) as needed while ArcView GIS is running. Choose File > Extensions from the menu. In the Extensions dialog box, click on the box next to the extension to be loaded. Click OK to exit the dialog box. Data extensions read different types of data—CAD drawing files, military file formats, and image files. Another article in this issue, “Modeling CAD Data in ArcView GIS,” describes how to use the CAD Reader extension to import, filter, and reproject

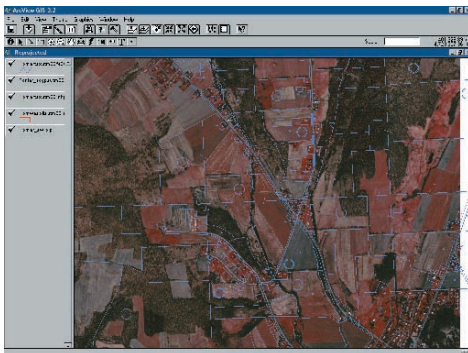
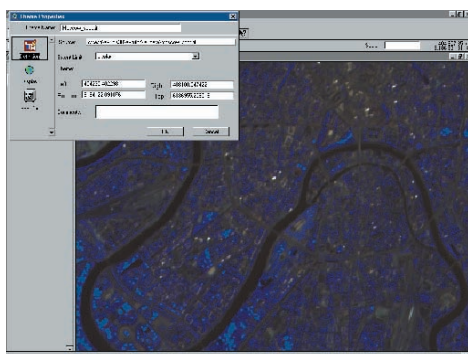
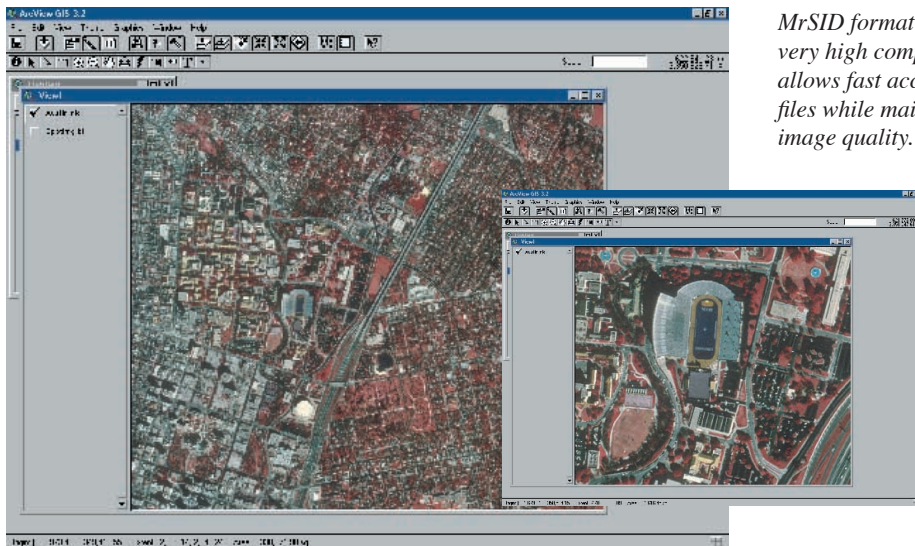


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CAD layers from MicroStation design (.dgn) and AutoCAD drawing (.dwg) files. Extensions that let ArcView GIS use military data formats, such as ADRG (ARC Digitized Raster Graphics), CADRG (Compressed ARC Digitized Raster Graphics), CIB (Controlled Image Base), NITF (National Image Transfer Format), and VPF (Vector Product Format), come with the core product in addition to the four extensions that support the use of image data in TIFF, JPEG, MrSID, and IMAGINE format.

TIFF 6.0 Image Support Extension

TIFF is an image format widely used in desktop publishing, and ArcView GIS directly supports all versions of TIFF with the exception of TIFF 6.0. It may not be apparent in which version a TIFF image has been saved. If a TIFF file added to a project will not display, delete the theme, choose File > Extensions, and load the TIFF 6.0 Image Support extension. Once loaded, this extension will override the core TIFF support in ArcView GIS and allow TIFF 6.0 images to be used. However, TIFF files saved in most other versions will not display with the TIFF 6.0 extension loaded. GeoTIFF 1.0 is supported by both core ArcView GIS and ArcView GIS with the TIFF 6.0 Image Support extension loaded. ArcView GIS uses the georeferencing information in the GeoTIFF tags to properly place the image at the correct location in a view.

If a TIFF image still will not display after the TIFF 6.0 extension is loaded, the file may use the Lempel-Ziv and Welch (LZW) compression method and require an LZW license. No error message will be displayed. TIFF/LZW compressed image data in ArcView GIS can be used with an optional software library available from ESRI.

JPEG (JFIF) Image Support Extension

JPEG is a standard compression technique for storing full color and gray scale images that is supported in the JFIF file format. To use JFIF files with JPEG compression, load the JPEG (JFIF) Image Support extension. By default, ArcView GIS looks for JFIF images with the JPG file extension.

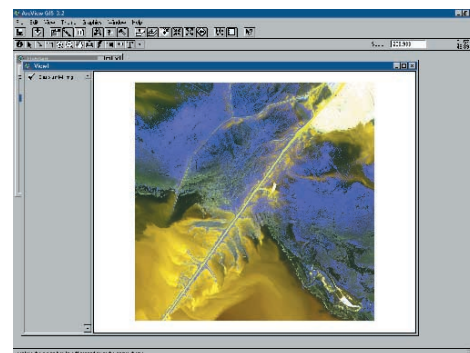
MrSID Extension

MrSID is an acronym for the Multiresolution Seamless Image Database format developed by ESRI business partner LizardTech. This wavelet-based file format has a very high compression ratio that allows fast access to large image files while maintaining maximum image quality. Once the MrSID Image Support extension is loaded, ArcView GIS will see and load files in this format if they have a SID file extension.

IMAGINE

IMAGINE files, created using IMAGINE image processing software from ERDAS, an ESRI business partner, can be used by loading the IMAGINE Image Support extension. ArcView GIS will see and load IMAGINE files with IMG file extensions once this extension is loaded.

To go beyond the basics of adding and displaying image data in ArcView GIS, read the ArcView GIS online help or read the user manual, *ArcView GIS: The Geographic Information System for Everyone*. These resources describe how to use the Image Legend Editor to change the way an image is displayed and how to create an image catalog to work with multiple images as a single theme. **AU**



ArcView GIS will see and load IMAGINE files with IMG file extensions once this extension is loaded.