



# Image Analysis™ for ArcGIS®

## Image Processing for the ArcGIS Environment

Imagery is a useful source of geospatial data and Image Analysis™ for ArcGIS helps GIS professionals prepare “GIS-ready” imagery. By working directly with users’ data in a single software environment, Image Analysis for ArcGIS can help users avoid data corruption that often occurs with multiple-step conversion processes. Whether collecting reliable geographic content or extracting updated information from imagery into a geodatabase, this all-in-one solution increases the accuracy of user data and saves time.

Additional features include:

- Single frame orthorectification for aerial and satellite data
- Color balancing and mosaicking
- Supervised & unsupervised land cover classification
- Geoprocessing tools in ArcToolbox
- Many more...

## Features

### Data Types and Integration

Image Analysis for ArcGIS is tightly integrated with ArcGIS and can run on ArcView, ArcEditor or ArcInfo. ESRI’s ArcGIS allows direct access to many raster data formats. Image Analysis for ArcGIS allows for the creation of a TIFF, ESRI GRID or ERDAS IMAGINE® .img file after processing. Image Analysis for ArcGIS also supports the import and export of numerous satellite and image file formats.

### Image Processing and Analysis

Image Analysis for ArcGIS provides access to a number of tools that are useful in general image preparation as well as several standard image processing and GIS techniques that will enhance and analyze data. For example, a user can subset an image to create a new image that contains just one particular area of interest, or mosaic a number of images and make use of the software’s color balancing options.





## Image Analysis™ for ArcGIS®

- Spatial Enhancement Tools:
  - Convolution Filtering
  - Non-Directional Edge Detection
  - Focal Analysis
  - Resolution Merge
- Radiometric Enhancement Tools:
  - Look-Up Table Stretch
  - Histogram Equalization
  - Histogram Match
  - Brightness Inversion
- Spectral Enhancement Tools:
  - Color Transformations
    - RGB to IHS
    - IHS to RGB
  - Natural Color Simulation
  - Vegetative Indices
    - SQRT (IR/R)
    - IR/R
    - Veg Index
    - NDVI
    - TNDVI
- GIS Analysis Tools:
  - Neighborhood Functions
  - Automated Change Detection for Thematic Data
  - Recode
  - Summary (cross tabulation statistics)
- Utilities:
  - Automated Change Detection
  - Create New Image
  - Layer Stack
  - Mosaic Images
    - Overlap areas handled by Average Value, Order Displayed, Minimum Value or Maximum Value
    - Automatically crop images by percent to remove edge artifacts like fiducials
    - Optional Color Balance by Brightness/Contrast or Histogram Matching
  - Reprojection of an Image
  - Rescale Image
  - Subset Image
    - Subset specific bands out of an image
    - Subset using an analysis mask
    - Subset by user defined area

- Data Conversion Capabilities:
  - Raster to Vector
  - Vector to Raster

### Multispectral Classification

The classification tools in Image Analysis for ArcGIS are easy to use. Unsupervised Classification only requires that the input and output files be specified along with the number of desired classes for the output. Supervised Classification allows users to create a new shapefile and use the region grow tool to collect signatures. That signature file is used during processing to generate the classified output.

- Unsupervised Classification
  - ISODATA algorithm
- Supervised Classification
  - Maximum Likelihood, Mahalanobis Distance, Minimum Distance or Parallelepiped Classification Rule
- Signature Creation
  - Automatic region growing tool

### Geometric Correction/Orthorectification

With Image Analysis for ArcGIS, users can align an image with a referenced image or vector file, or perform single frame orthorectification.

- Georeferencing
  - Polynomial
  - Rubber Sheeting
- Sensor Models for orthorectifying data
  - LANDSAT TM and MSS
  - SPOT – XS/XI, Pan
  - IKONOS RPC
  - QuickBird RPC
  - RPC
- Standard Frame Camera

### Geoprocessing Functions

All functions, with the exception of the seed tool and georeferencing/orthorectification tools, are also available from ArcToolbox as geoprocessing functions. Behaving like the standard ArcGIS tools, they are available for scripting or can be linked with other tools to create a model to accomplish a workflow.

