Digital Photos

Geotagging Digital Photos

Geotagging is the process of adding geographic coordinates to digital photos. The JPEG files created by digital cameras include an EXIF (Exchangeable Image File) header with available tags for latitude and longitude (and many other parameters pertaining to the acquisition of that photo). Only a few digital cameras are currently capable of determining and storing these coordinates at the time of photo acquisition by means of an on-board or linked Global Positioning System (GPS) device. The Create Geotagged Image Database process in TNTmips (accessed from the Tools menu) allows you to compute or set the geographic positions for a set of selected digital photos, provides the option for writing the geotag information back to the photo file's EXIF header, and creates a database table recording the geotag and other information for each photo. The resulting table can be pinmapped in any geospatial view, where the default DataTip for each pin symbol is a thumbnail of its image.

The Image List at the top of the Create Geotagged Image Database window allows you to add any number of digital photo files for geotagging and inclusion in the output table. The image list shows the image filename and the acquisition date and time for each photo, and provides a Description column that you can use to enter a name or explanation for each photo for inclusion in the table. Icon buttons above the list allow you to view the image and the EXIF metadata for the photo file currently selected in the list.

(You can also double-click on the image's list entry to view it in the image viewer window.) If a listed photo already has existing EXIF geotags, those coordinates are automatically shown in the Latitude and Longitude fields in the image list; otherwise those fields remain blank until geotag coordinates have been determined or entered.

The Geotag process provides several methods for determining photo coordinates. If you used a GPS device while taking the photos and saved track logs or photo waypoint lists, simply add the log files to the Log List. The process then automatically determines photo coordinates by comparing each photo's date and time with the date/time information in the GPS logs. You can then open a Database Pinmap view of the assigned photo locations overlaid on a georeferenced raster image of your choice and use tools provided with that window to move and refine the photo positions if needed. More information about procedures using GPS logs is provided in the Technical Guide entitled *Digital Photos: Geotag Digital Photos from GPS Logs*.

You can select any photo in the image list and view the photo and its EXIF header information.

Add Images   Remove Image   Remove All Images   View Image   View Image Metadata

Press the Run button to save the database table with image names, geotag coordinates, and other information.

Press the Write EXIF button to update the EXIF headers of the selected photo files with the geotag coordinates.

Use the Description column in the Image List to enter a description of each image for inclusion in the table.

Press the Save KML button to save a Google Earth KML file with the photo locations and links to the photo files on your hard drive. You can double-click on this KML file to launch Google Earth and automatically add the images to your Places list. Google Earth then automatically zooms in to show a placemark symbol and photo name label for each photo. You can double-click on a placemark symbol to show the photo in a pop-up viewer window.

(over)

Database Pinmap

The Database Pinmap view in the Geotag process allows you to visually assess GPS-derived photo positions and adjust them as needed, or to assign coordinates to photos without concurrent GPS logs.
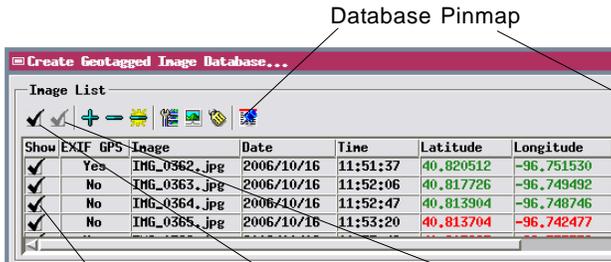
Show/Hide individual photo in pinmap view

Show all images in pinmap view

Hide all images in pinmap view

If no GPS logs are available, use the Database Pinmap view to derive coordinates for each photo visually by locating its position in a georeferenced orthoimage, satellite image, or scanned map. If coordinates have been previously obtained from another source, you can enter them directly in the image list coordinate fields. These manual methods, which can also be used to geotag JPEG, TIFF, or PNG image files lacking EXIF headers, are described more fully in the TechGuide entitled *Digital Photos: Manually Geotag Digital Photos*.

After coordinates have been set for all photos in the image list, press the Run button to create a geotagged photo database table. You can also optionally press the Write EXIF button to transfer each photo's coordinates to the photo file's EXIF header.

The geotagged photo table has a record for each photo and includes all of the fields shown in the image list. You can save this table in MicroImages format within a Project File, or save it to an external database such as MySQL or PostgreSQL. You can choose to create the geotagged photo table with a text link to each photo's directory path and filename, or embed each image in a <u>Binary Large OBject</u> (BLOB) field within the table. Either form of geotagged image table can be used to pinmap each photo's position using the coordinate fields in the table (see the TechGuide entitled *Digital Photos: Pinmap Digital Photos with Photo DataTips*). However, to use a table with only text links you must retain the original photo files in the same relative directory path.

When you embed the photo images as BLOBs in the geotagged image table, a thumbnail of each image is automatically created and stored in a separate BLOB field in the table. You can set the maximum width/height for this thumbnail, which is used to create pop-in DataTip images of the photos from the table views or from pinmap point symbols. (For tables with linked images, the DataTip thumbnail is created dynamically from the external image file as needed, which may delay the appearance of the DataTip.) The photos can be viewed in several ways from either tabular or single-record views of the table (see the TechGuide entitled *Digital Photos: Viewing Geotagged Image Tables*).

The Geotag process computes positions in WGS84 / Geographic (latitude, longitude) coordinates, which are the coordinates provided by GPS logs and which conform to the format contraints of their geotag fields in the EXIF header (only latitude / longitude coordinates supported). However, you can transform the photo positions to another coordinate reference system (CRS)
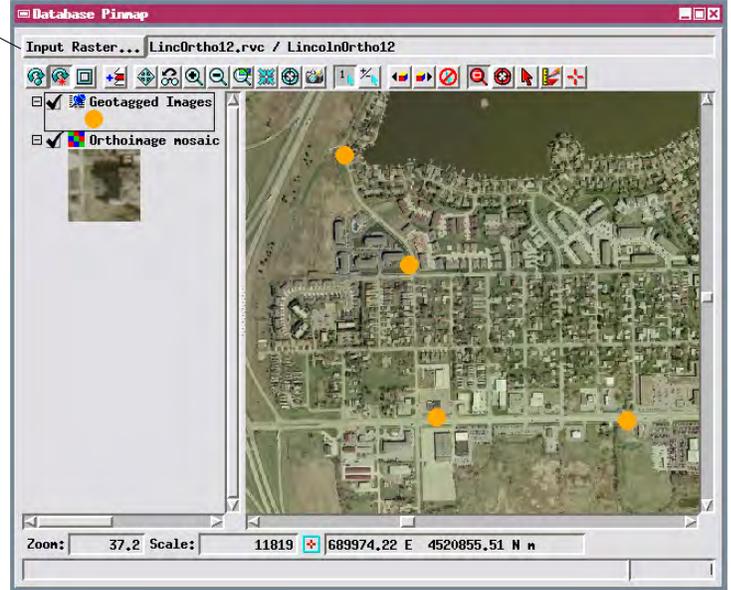
You can choose to store photo coordinates in the table in any supported coordinate reference system. However, the coordinate geotags in the photo file EXIF headers are always written in decimal latitude / longitude coordinates.
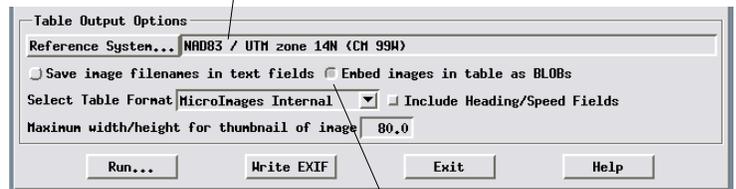
Use these radio buttons to choose between embedding image BLOBS in the output table or saving only links to the external photo files.
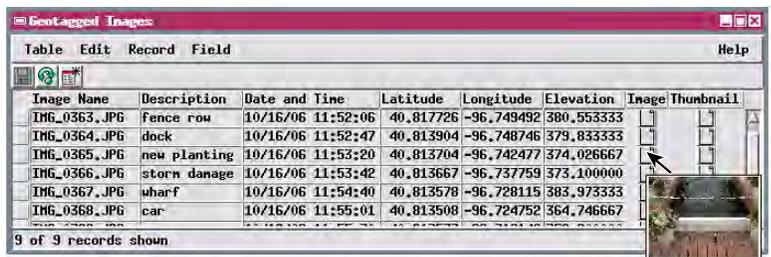
Tabular View of Geotagged Image table with embedded images. Positioning the cursor over the Image field pops up a ToolTip showing a thumbnail view of the image in that record.

for storage in the output table by pressing the Reference System button and choosing the desired CRS. If you choose a CRS with projected coordinates, the Latitude and Longitude fields in the image list in the Create Geotagged Image Database window are replaced by Northing and Easting fields that show the projected image coordinates in your selected CRS. When you run the process, however, Latitude and Longitude fields are written to the geotagged image table along with the Northing and Easting fields.