

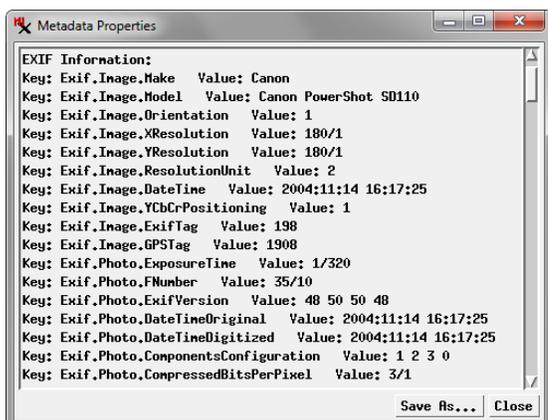
Create Geotagged Image Table

A *geotagged* digital photo has geographic coordinates stored in EXIF (Exchangeable Image File) tags in the image file (typically a JPEG file). The Create Geotagged Image Table process in TNTmips (accessed from the Database menu) creates a table in a new or existing database that records the geographic position and other information for each of the selected geotagged photo files. The photos can be embedded in a field in the table or the table can merely contain links to the stored locations of the photos. In either case, the resulting table can be pinmapped in any geospatial view, where the default DataTip for each pin symbol is a thumbnail of the image. Alternatively, you can direct the process to create a vector object with points representing the photo locations and an associated database table. The geotagged photo table or vector object allows you to use the geotagged photos along with your other geospatial data in your projects. The Create Geotagged Image Table process can also assign geographic coordinates for digital photos that are not yet geotagged, either automatically from one or more GPS logs, or manually (see the Technical Guide entitled *Geotagging Digital Photos*).

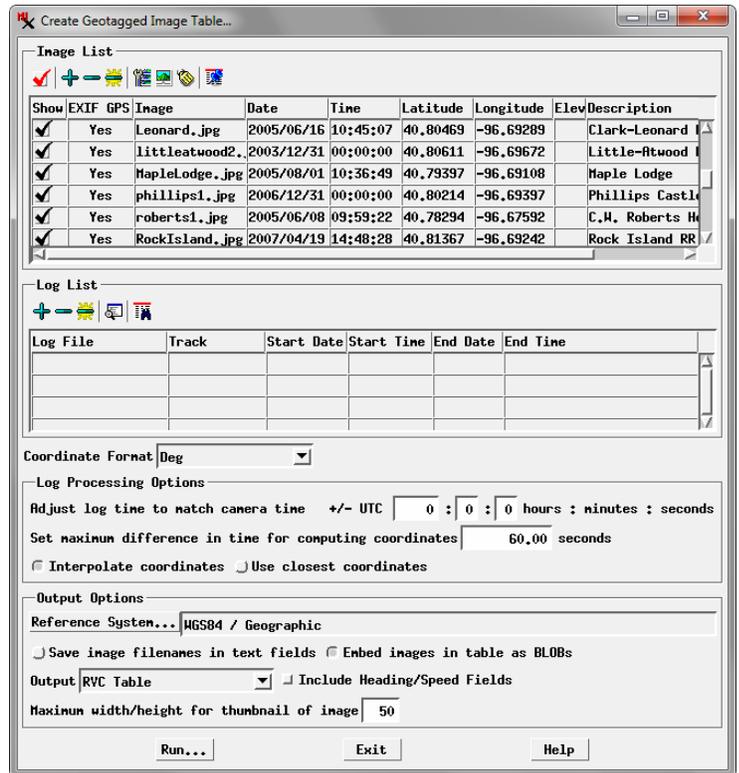
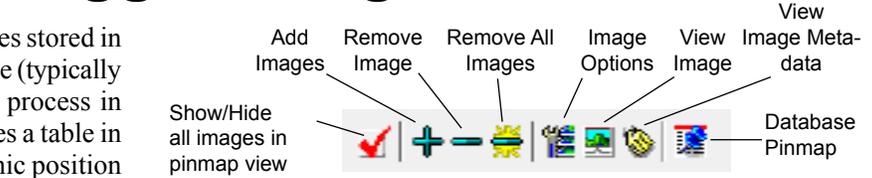
Image List Controls

The Image List at the top of the Create Geotagged Image Table window shows the information for each digital photo file selected using the Add Images icon button above the list. The image list shows the image file name and the acquisition date and time for each photo. The EXIF GPS column entry shows (by Yes or No value) whether the image is already geotagged. The Latitude and Longitude fields automatically show the coordinates for any geotagged image, otherwise these fields are blank until coordinates have been determined or entered in the process. A Description column is provided which you can use to enter a name or explanation for each photo to be added to the table.

An image can be selected in the Image List by left-clicking on any field in its list entry; a selected image is highlighted in black. Press the View Image icon button to open an image viewer displaying the photo. (You can also double-click



Press the View Image Metadata icon button to view the EXIF tag values for the selected photo.



on the image's list entry to open the image viewer.) Press the View Image Metadata icon button to open a Metadata Properties window that lists the EXIF tag values stored with the photo.

Pressing the Image Options icon button opens a menu with choices for assigning coordinates to the selected photo when you are geotagging. The Database Pinmap icon button opens a View window that lets you view the photo positions relative to a georeferenced raster object of your choice and to interactively adjust the positions. These options are discussed in more detail in the *Geotagging Digital Photos* TechGuide.

Press the Remove Image icon button to remove the selected photo from the list, or the Remove All Images icon button to clear the list.

Table Output Options

A geotagged photo database table has a record for each photo and includes all of the fields in the Image List. The Table Output Options controls let you set other parameters for creating the table.



Press the View Image icon button (or double-click on the list entry) to view the selected digital photo.

(continued)

Use the Output menu to choose the type of result to create. You can save a database table in a TNTgis Project File using the RVC Table option, or save it to a DBASE file, a Microsoft Access file, or to a MySQL or PostgreSQL database. Choose the Vector Points option to create a vector object with a point element attached to each record in the geotagged image table.

Alternatively, you can save the photo links in other formats for use outside of TNTgis. The Comma Separated Values menu option sets the standard CSV text format as the output option, while the Text Formats option lets you set the format of the output text file when you run the process. Choose the KML option to save a Google Earth KML file containing copies of the photos and KML code to position them in Google Earth.

You can use the EXIF output option to write the computed or assigned photo locations to the EXIF tags in the input digital photo files (see the *Geotagging Digital Photos* TechGuide).

Turn on the Include Heading/Speed Fields toggle next to the Output menu to transfer these parameters from GPS logs you have used to geotag the photos.

Radio buttons above the Output menu let you choose to *Save image filenames in text fields*, which creates only a *File name* field with a text link including each photo's directory path and file name, or *Embed images in table as BLOBs*, which stores the actual photos in the table in a Binary Large Object field named *Image*. (The latter option is not available when you choose the Comma Separated Values or Text Formats output option.) Geotagged image tables with embedded photos are completely portable and can be moved to any drive or computer. Tables with text links and their referenced photo files must be kept in their original drive and directory locations in order to maintain the links.

When you embed the photo images, a thumbnail (reduced-size version) is automatically created for each image and stored in a separate Thumbnail field. The *Maximum width/height for thumbnail of image* numeric field at the bottom of the Table Output Options box lets you set the maximum dimension of the thumbnails. These thumbnails are used by default as the DataTip for the pinmap point symbols, or they can be used as the point symbols themselves. (For tables with image links, the DataTip thumbnail is created dynamically from the parent image as needed, which may delay appearance of the DataTip.)

Geotag coordinates are recorded in image EXIF tags in WGS84 / Geographic (longitude, latitude) coordinates, and a geotagged image table always includes Latitude and Longitude fields. However, you can also include photo position coordinates in another coordinate reference system. Press the Reference System pushbutton at the top of the Table Output Options box to open the Coordinate Reference System window to choose the desired reference system. If you choose a projected reference system, Northing and Easting fields are created in the table to contain the projected coordinates.

Running the Process

After you have set all desired options, press the Run pushbutton at the bottom of the window to create the result. If you are using the RVC Table output option, a Select Database window appears in which you can create a new or select an existing database

object; a Select Table window then appears in which you can select a new or existing table. If you select an existing table, a record is appended to the table for each image file unless a matching image name is found in the table; in this case, the existing record is modified.

For vector output you are prompted to create a new vector object in a Project File and to name the point table to contain the geotagged photo information.

When you create the photo table in a TNTgis Project File, the photos can be displayed in several ways from either tabular or single-record views of the table (see the TechGuide entitled *Viewing Geotagged Image Tables*).

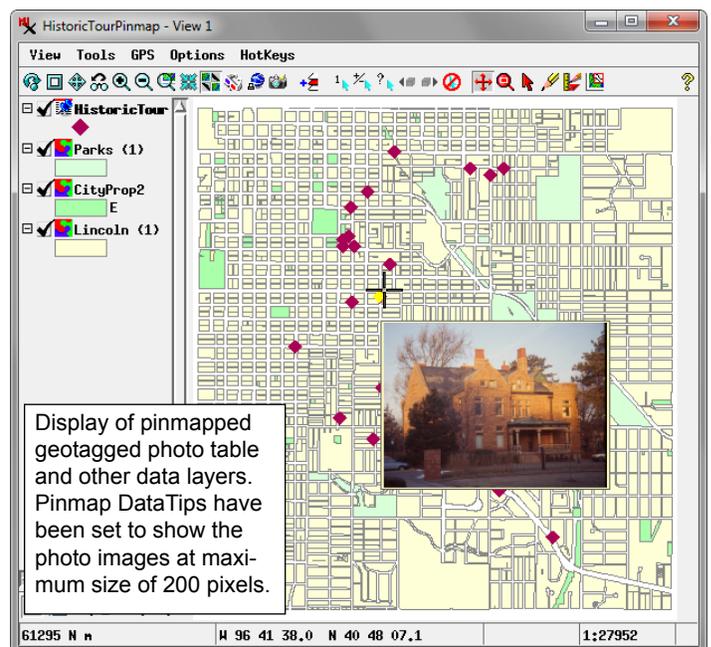
If you have selected the Comma Separated Values, Text Formats, Microsoft Access, or DBASE output options, pressing [Run] opens an Export Parameters window opens in which you can set the text encoding for the table.



For the Text Formats option you can also set the format of the output text file as either columnar or separated and set the Separator character. Press the Export pushbutton to name the output file and start the conversion.

If you have selected the MySQL or PostgreSQL output option, after pressing [Run] you are first prompted to name the output table, then presented with an Export Parameters window to set the table encoding. Press [Export] to open the Database Login window to provide login information for the database.

For KML output, pressing [Run] prompts you to name a KML file. You are also prompted whether to set the image thumbnails to be used as the point symbols and whether to automatically launch Google Earth. When the KML file is opened in Google Earth, the view zooms automatically to the extents of the photo points. Left-click on the placemark symbol to show the photo in a pop-in viewer window.



Display of pinmapped geotagged photo table and other data layers. Pinmap DataTips have been set to show the photo images at maximum size of 200 pixels.