Steps for assigning GPS coordinates to digital photographs

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Please contact us if you have any questions or suggestions on how we can improve this document.

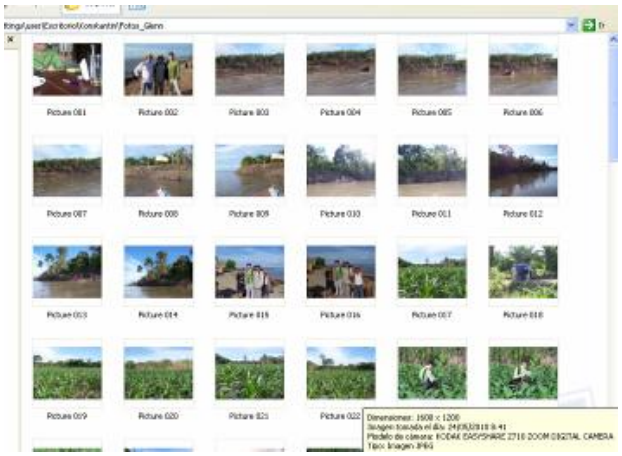
Materials and methods.

- digital camera
- global positioning system (we used a Garmin Etrex).
- An Internet connection
- DNR GPS point extraction software. http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRGarmin/DNRGarmin.html)
- Photomapper software for assigning coordinates to photographs (http://software.copiks.com/photomapper/)

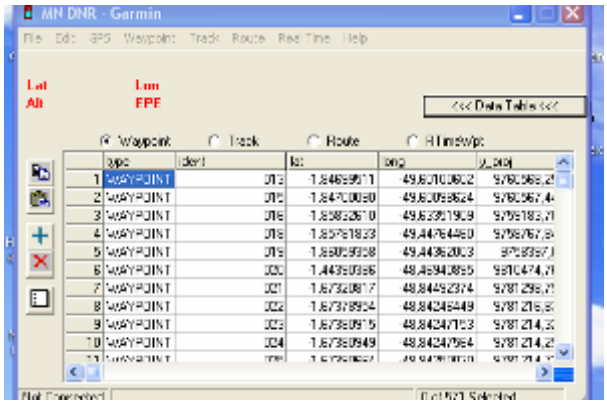
Steps.

1. One of the most important steps is to synchronize the clocks on your global positioning system and digital camera before you go out to the field. Extra time making sure you get this right will be worth it in the end. Normally, the GPS unit does not allow you to change the time. The time on this unit is derived from the satellite system. Therefore you will need to set the time on your digital camera to be synchronized with the GPS unit.

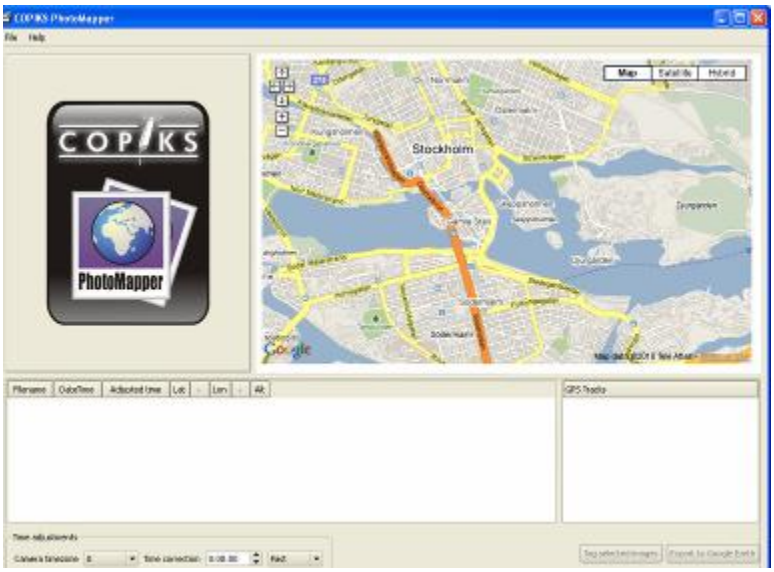
2. After you come back from the field, download your digital photographs to a computer.



3. Use the DNR software to download the GPS points. Different GPS units will have different ways to download the data to your computer. They may also download the data in different formats. The Photomapper software accepts several different formats. The GPS exchange format (*.GPX*) is the recommended format. Once you have your downloaded points in this format, you can close the DNR software application.



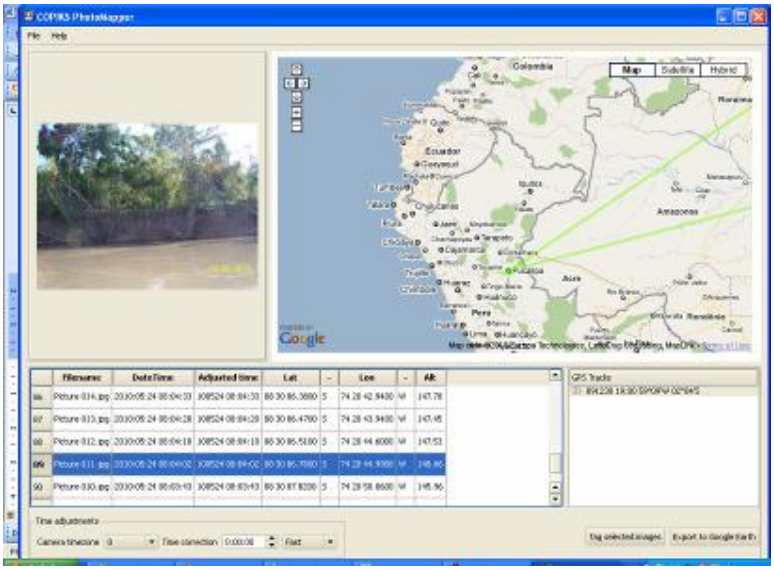
4. Open Photomapper. You will note the Google Maps interface in the right-hand portion of your screen.



5. Click on FILE>>IMPORT GPS DATA and navigate to the *.GPX* file that contains your GPS points. Select the correct data file and click on OPEN.

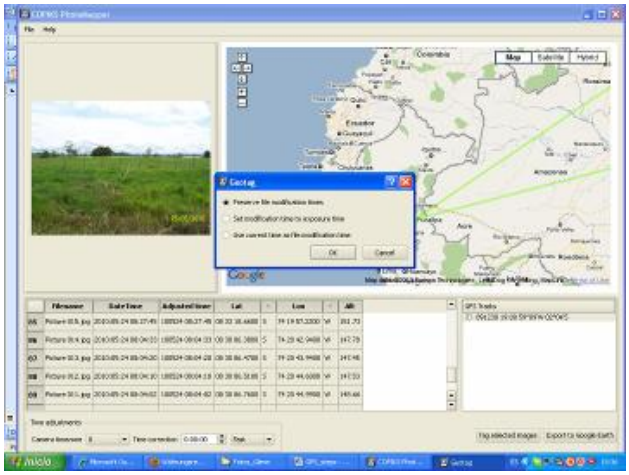
6. Click on FILE>>IMPORT IMAGES and navigate to the directory where you have stored your digital photographs. Choose the photographs that you want to geotag and click on OPEN.

7. When you click on the row of a photograph, that photograph will be displayed in the upper left-hand portion of your screen. When you click on the row of a GPS point, that location will be displayed in the Google Map interface in the upper right-hand portion of your screen.



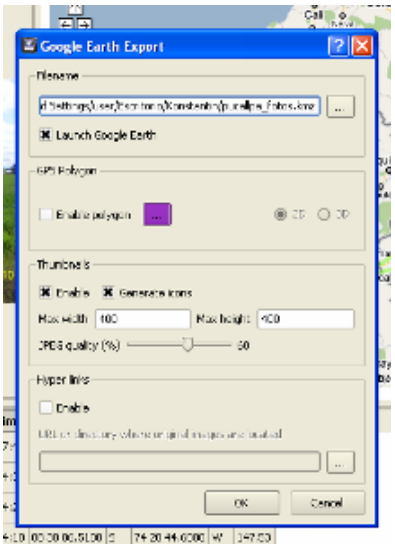
8. Choose the photographs that you want to geotag by clicking on the row number. Use the shift and control keys to assist you in selecting the photos. Once you have selected to the photographs that you want geotag, click on the TAG SELECTED IMAGES button in the lower right-hand part of the interface. The software will automatically tag the selected photos. Very possibly all the photos will not be tagged. Any photos that do not have a timestamp that is close to the timestamp of the GPS point will not be tagged. You can establish an adjustment on the time stamp of the photographs by changing the values in the time adjustment area of the lower left-hand portion of the interface. You can change the time zone of the camera or the number of minutes, seconds and hours of offset for the photograph. You will not need to do this if you have properly synchronized your digital camera and GPS unit before you went to the field. The time adjustment controls are useful when your camera and GPS units were not synchronized.

9. Your digital photographs will now be geotagged, with the latitude and longitude coordinates listed. These photographs can now be used in other programs, where the location information can be utilized.



10. You can now export the photos to Google Earth as a KMZ file (the compressed version of a KML file). Select the photos that you want to export and click on EXPORT TO GOOGLE EARTH.

11. The dialog box allows you to do choose a name and location for the Google Earth file that you are going to create. By selecting the enable polygon check box, you can include the GPS tracks associated with the geo-tagged photograph. The thumbnails dialogue area allows you to create thumbnails and icons for your Google Earth file. You can also select the width and height of your photograph and the quality of the image. Larger dimensions and higher quality will give you larger digital files. You should test out different values when you use this export function in order to find the values that best meet your requirements. You can also check the hyperlinks box to be able to link the photograph in Google Earth to the original photographs in a directory on your hard drive or in a location on a server connected to the Internet. This allows you and your users to access the original digital photographs that you took in the field.



12. Choose OK , and the software will create your KMZ file

13. If you need any help with the geode tagging software. Go to the following website: http://copiks.com/software/photomapper/help/v07/