

# Geo-Tagging Software Solutions - Embedding Location in Photos

List of available software solutions to store GPS information in photos. Preferences lean to those solutions that store location in the EXIF header of still images.

Revision History: 10/12/05; 3/15/07

Software	EXIF Capabilities				GIS Functionalities							GPS	File Management Capabilities		
	Can Write Lat/Long into EXIF?	EXIF Editor Built In?	Can Manually input Lat/Long?	Can Automate Best Photo Match?	Section of EXIF Written To	Stores coordinates in attribute table	ArcGIS Extension Available	Reads EXIF and Makes ArcMap Photo Elements?	Watermark Capability	HTML Map Capability	Automates Hyperlink in ArcGIS?	Accepts Waypoints, Points or Tracklogs	Type of GPS Allowed for Input	Cost	Resize(RS);Rotate(R);Brightness(B);Contrast(C);File Renaming(FR)
<b>Standalone GeoTagging Software</b>															
<sup>1</sup> DNR Garmin V. 5.2.33**	N	N	N	Y	Not Capable of Writing to EXIF	Y(shape)	Y	N	N	N	N	Waypoints or Tracklog	Garmin	Free	none
<sup>2</sup> GPS PhotoLink	Y	N	Y	Y	GPS; Camera Description	Y(shape)	Y	Y	Y	Y	Y	All	Garmin, Magellan, Trimble	\$229	All
GPS Photo Linker (Mac Only)	Y	Y	Y	Y	UNKNOWN	N	N	N	N	N	N	Tracklogs Only	Garmin or Magellan	Free	UNKNOWN
Media Mapper	N	N	Y	Y	GPS; Camera Description	Y(shape)	N	Y	Y	Y	Y		Garmin, Magellan, Trimble	\$595	RS; R
RoboGEO v 5.3.6	Y	N	Y	Y	GPS	Y	N		Y	Y	N	All	Various	\$39	RS;R;FR
<sup>3</sup> Robo Photo (unable to find in 2008)		Y	Y	N	GPS	N	N	N	N	Y	N		Garmin	\$35	UNKNOWN
Visual Media Explorer 5.2		Y	Y	N	Camera Description Only	N	N	N	Y	Y	N		Garmin	\$25	RS;R;FR
<sup>4</sup> ArcPad-Specific Field Geo-Tagging Software (Optimized to work with WIFI Cameras sending photos to pda running ArcPad 7.0 and 7.1. As of Feb 2008, both Wind Image and GPL work best with Ricoh camera. TrimPix with Nikons only.															
<sup>4a</sup> TrimPix / Nikon WIFI Coolpix	N	N	N	N	Not Capable of Writing to EXIF	Y(shape+MDB using Correct	N	N	N	N	N	Points and Tracklogs	Trimble, NMEA based GPS	Free	none
<sup>5</sup> Wind Image for ArcPad v. 2.0	N	N	N	Y	Not Capable of Writing to EXIF	Y(shape)	N	N	N	N	N	Tracklogs, Points	NMEA based GPS	\$95	FR
GPS PhotoLink for ArcPad	N	N	N	Y	Not Capable of Writing to EXIF	Y(shape)	Y	Y	Y	Y	Y	Tracklogs, Points	Garmin, Magellan, Trimble	\$229	All
<b>ArcGIS Extensions</b>															
<sup>6</sup> ArcPhoto AS14846 1/7/2008	Y	N	N	N	UNKNOWN	Y(Shape+ MDB +GDB)	Y	Y	N	N	Y	Input from Web	Not Applicable. Not for live feed of GPS.	Free	none
PixPoint for ArcGIS	Y	N	Y	Y	GPS; Camera Description	Y(Shape+ MDB)	Y	Y	N	N	Y	Tracklogs Only	Garmin, Magellan, Trimble	\$395	UNKNOWN
NXP Softwares Sw GPS		Y					embedded software inside a camera						?		

**Notes:**

<sup>1</sup> DNR Garmin does not write to EXIF. Using Extensions and pathnames, hyperlink to images can be written to in a shapefile.

<sup>2</sup> GPS Photolink is the recommended geotagging software by the Alaska Region, NPS. Offers greatest file management, EXIF writing power and watermarking capability for the price.

<sup>3</sup> RoboPhoto (As of 2005) requires public FTP access to write to EXIF. Unable to confirm in 2008.

<sup>4</sup> ArcPad requires GPS interfaced cameras for capturing photos. Able to read EXIF locations from previously GPSlinked photos.

<sup>4a</sup> Trimpix. Ability only to associate a point feature in either TerraSync or Arcpad with a photo collected within a time frame. Designed to work with wireless cameras that populate Pictures directory on mobile device and associate a hyperlink with image. Does not write EXIF.

<sup>5</sup> Wind Image for ArcPad - Ability only to read EXIF, not write, and associate images based on that. When used with a standard camera it simply associates images with a feature in ArcPad storing the coordinate in the feature not the image EXIF

<sup>6</sup> ArcPhoto not designed for live feed GPS. Designed to enhance ArcGIS 9.2 use of EXIF geotagged photos with geoprocessing tools.

## GeoLinking Camera Solutions - Targeting Ruggedized - GIS level systems

List of Hardware/Software Combinations that provide coordinates with photos. Some camera systems require wireless transmission of photo to datalogger.

Camera System	Can Write Lat/Long into EXIF?	Camera Hardware									GIS Functionalities		
		GPS	DGPS?	Laser (Range/Accuracy)	Digital Compass (res)	Inclinometer(Accuracy)	Highest Camera Resolution	Windows OS?	Comms	Power	GIS Output	NOTES	Cost
Ricoh 500Se Camera	Y	Y int	SBAS (Sif III)	N	NA as of March 07	N	8	NA	BT;WI-FI	Li Ion 8hrs		Good Initial review	\$1200 - \$1400
Ike 304 laser GPS	N	Y int	SBAS DGPS Capable	1000m/0.5%	Y 3deg	Y(0.4deg)	3	Mobile 5	BT;WI-FI;USB;RS232	BT;WI-FI;USB;RS232	Shapefile; CSV	Expensive but everything	\$10K
Red Hens D2X / D1X (Gecko GPS hotshoed to Nikon D2X or D1X series)	Y	Y ext	Garmin Gecko - SBAS	N	N	N	SEE NIKON	NA	HOTSHOE	GPS: AA	TAGGED PHOTOS	Garmin Gecko - Tracklog capture only	na
Nikon Wireless Cameras (TRIMPIX)	N	N	N	N	N	N	8	N	WI-FI	AA			
Topcon GMS-2*	N	Y int	SBAS DGPS	N	Y 16 div. acc	N	1.3	Win.CE 5	BT;RS232	LI ion 7hr	TopPAD/TOPS urv		\$4,700
Ricoh Pro G3 Camera	N	Y ext	N	NA	NA	NA	3.3	NA	CABLE	AA; 6 hrs		Outdated	\$500
JOBO photoGPS*	N	N	Unknown	NA	NA	NA	NA	NA	HOTSHOE	Draw f.camera	Propiertery		\$149

\* JOBO: Hotshoe camera accessory and software due out Summer 2007. Will use NXP's Softwares Sw GPS to process

## Where To Go For More Information

### Articles / Books

Leonard, Vickie, 2003: How to Stamp Location on Digital Photos. GPS User Magazine Fall 2003. <http://www.gpsuser.com/BoAvBeCa/issue.html>.

Spencer, J., Frizzelle, B.G., Page, P.H., Vogler, J.B., 2003: Global Positioning System A Field Guide for the Social Sciences. Malden, MA: Blackwell Publishing. 218 pp.

### Software Hardware Links

ArcPad 7	<a href="http://www.esri.com">www.esri.com</a>
DNRGarmin V. 5.1.1	<a href="http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRGarmin/DNRGarmin.html">http://www.dnr.state.mn.us/mis/gis/tools/arcview/extensions/DNRGarmin/DNRGarmin.html</a>
GPS PhotoLink	<a href="http://www.geospatialexperts.com">www.geospatialexperts.com</a>
GPS Photo Linker	<a href="http://oregonstate.edu/~early/gpsphotolinker/">http://oregonstate.edu/~early/gpsphotolinker/</a>
PixPoint ArcGIS Extension	<a href="https://ecommerce.redhensystems.com/c-4-mapping-software.aspx">https://ecommerce.redhensystems.com/c-4-mapping-software.aspx</a>
Red Hens D2X / D1X	<a href="http://www.redhensystems.com/products/video_collection_hardware/d1x-gps.asp?sm=1">http://www.redhensystems.com/products/video_collection_hardware/d1x-gps.asp?sm=1</a>
Robo Geo	<a href="http://www.robophoto.com">www.robophoto.com</a>
Visual Media Explorer	<a href="http://www.visualmediasoftware.com">www.visualmediasoftware.com</a>
Wind Image for ArcPad	<a href="http://www.windenvironmental.com/windimage/index.html">http://www.windenvironmental.com/windimage/index.html</a>
Sw GPS	<a href="http://www.software.nxp.com/About/technologies/spot/Index.html">http://www.software.nxp.com/About/technologies/spot/Index.html</a>
Topcons GSM-2	<a href="http://www.topconpositioning.com/index.html/session_id/2176cfa6ce6f58a1a082e2f0f95a0bf/screen/model/category_id/id4404acce865343.49529372/category_ids/599">http://www.topconpositioning.com/index.html/session_id/2176cfa6ce6f58a1a082e2f0f95a0bf/screen/model/category_id/id4404acce865343.49529372/category_ids/599</a>
Jobo GPS	<a href="http://www.jobo.com/jobodigital/photogps/gb/index.html">http://www.jobo.com/jobodigital/photogps/gb/index.html</a>
Ike 304 Camera	<a href="http://www.survey-lab.com/ike304.htm">http://www.survey-lab.com/ike304.htm</a>