

Search

- [Start Here](#)
- [Quick Reference](#)
- [Best Practices](#)
 - [Color](#)
 - [Color Management Overview](#)
 - [Color Space and Color Profiles](#)
 - [Monitor Calibration and Profiling](#)
 - [Desktop Printer Profiling](#)
 - [Camera Profiling](#)
 - [Commercial Printing](#)
 - [Camera](#)
 - [Digital Camera Overview](#)
 - [The Shoot](#)
 - [Tethered Capture](#)
 - [Sensor](#)
 - [Raw vs. Rendered](#)
 - [Computer](#)
 - [Computer Overview](#)
 - [Performance](#)
 - [Ergonomics](#)
 - [Data Storage Hardware](#)
 - [Storage Hardware Overview](#)
 - [Hard Drive 101](#)
 - [Disk Configurations](#)
 - [Hard Drive Handling](#)
 - [Optical Media](#)
 - [Digital Tape](#)
 - [Image Editing](#)
 - [Image Editing Overview](#)
 - [Pixel Editing](#)
 - [Parametric Image Editing](#)
 - [Catalog PIEware](#)
 - [Sharpening](#)
 - [HDR Image Editing](#)
 - [File Format](#)
 - [File Format Overview](#)
 - [Raw File Formats](#)
 - [Rendered File Formats](#)
 - [Working & Delivery File Formats](#)
 - [Archive File Formats](#)
 - [File Management](#)
 - [File Management Overview](#)
 - [Directory Structure](#)
 - [File Naming](#)

- [Metadata](#)
 - [Metadata Overview](#)
 - [EXIF](#)
 - [IPTC](#)
 - [XMP](#)
 - [GPS](#)
 - [Ratings](#)
 - [Keywording](#)
 - [Metadata Templates](#)
 - [Metadata Handling](#)
- [Copyright Registration](#)
- [File Delivery](#)
 - [File Delivery Overview](#)
 - [File Delivery Checklist](#)
 - [Optimized File Delivery](#)
 - [Batch Processed File Delivery](#)
 - [Unrendered File Delivery](#)
 - [File Delivery Details](#)
- [Backup](#)
 - [Backup Overview](#)
 - [Backup Types](#)
 - [Internet Backups](#)
 - [Data Restoration](#)
 - [Backup System Configurations](#)
- [Data Validation](#)
 - [Data Validation Overview](#)
 - [Data Validation Details](#)
 - [Data Transfer](#)
 - [DNG Validation](#)
 - [Write-once Media Validation](#)
- [Migration](#)
 - [Migration Overview](#)
 - [Storage Migration](#)
 - [File Format Migration](#)
- [File Lifecycle](#)
 - [File Lifecycle Overview](#)
 - [Capture](#)
 - [Ingestion](#)
 - [Archive](#)
- [Workflow](#)
 - [Planning Overview](#)
 - [Case Studies](#)
 - [Batch Output Workflow](#)
 - [Optimized Image Workflow](#)
 - [CMYK workflow](#)
- [Resources](#)
 - [Glossary](#)
 - [Books](#)
 - [Links](#)
- [Seminars](#)
- [About dpBestflow](#)
 - [Project Overview](#)

- [Legal](#)

JOIN ASMP NOW

[Home](#) > [Best Practices](#) > [Metadata](#) > GPS

GPS

Peter Krogh

GPS data offers a way to create precise and unambiguous location information that is not language-specific, and can remain accurate even as names change. It will play an increasing role in the organization and use of image collections.

[GPS: An overview](#)

[Using GPS information](#)

[GPX and EXIF](#)

[Geotagging your photos](#)

[Privacy issues](#)

GPS: An overview

GPS technology was first developed for the US military for use in determining precise locations. A GPS receiver uses a series of geostationary orbiting satellites to compute its location by triangulation. GPS data can include latitude and longitude, as well as altitude, speed, direction, and more. Since we're mostly concerned with information about the instant the shutter was snapped, we'll mostly be interested in the latitude and longitude data and sometimes the altitude. This information can be used to determine the precise location of the camera when a photo was taken. (Although there is a lot of other information that can be saved in GPS metadata, it's harder to mash-up most of it usefully with the photo. The direction information, for instance, refers to the direction of travel, not the direction the camera is pointed.)

In the not-too-distant future, many digital cameras will have GPS receivers, the capability to use cell phone towers for tagging location, or the capability to grab GPS coordinates from Bluetooth devices that are nearby. (Some cameras have this already, but mostly they are point-and-shoots or cell phone cameras). At the moment, however, photographers need to do some work to attach the GPS data to their DSLR files. This page explores several methods for doing that.

Precise, enduring location data

Unlike the IPTC location fields, which provide incomplete and sometimes subjective information about where a photo was shot, GPS data can provide an objectively precise position. The IPTC fields may only be able to say, for example, that you took a photo in the Tasmanian State Forest, Tasmania, Australia, but GPS data can pinpoint a location of $-41^{\circ} 13' 58.10''$, $+147^{\circ} 59' 12.26''$, which is a precise spot within the state forest (Figure 1).



Figure 1 shows an image in Expression Media, along with a screenshot tagging that image on Google Maps. This is the kind of place that can't easily be described with traditional location notation, but can easily be pinpointed with GPS.


Not only does GPS data enable more precision, it can stand the test of time. Place names change: countries rise and fall, people buy and sell property, earth is turned to street, and buildings are built and torn down. With map coordinates and a timestamp, you'll never have to doubt where a photo was made.

Moreover, some databases can translate the GPS coordinates to location place names automatically, saving you the trouble of writing location names into your bulk metadata. In the near future, GPS data, along with a timestamp, will enable some good guessing about the nature and subject matter of the pictures. For instance, it will be possible to automatically tag photos shot at the time and place of the Super Bowl with the keyword "Super Bowl."

Using GPS information

Browsers, catalog software, web-based photo sites, and other utilities are starting to let you view GPS information attached to photos. Lightroom has a little arrow in the Metadata panel that pops a Google Maps window in your web browser with the image location shown (Figure 2). Expression Media 2 can launch a Virtual Earth window with the same kind of pin. The online service Flickr has a large geotagging community sharing information, and Google has a tool called Panoramio that enables your geotagged images to show up in Google Earth.

Library | Develop | Slideshow | Print | Web



Histogram

EXIF Metadata

Preset: None

File Name	Krogh_080410_4463.dng
File Path	RAW_535_Tasmania13
Dimensions	4288 x 2848
Cropped	4288 x 2848
Date Time Original	4/10/08 11:42:26 PM
Date Time Digitized	4/10/08 11:42:26 PM
Date Time	4/10/08 11:42:26 PM
Exposure	1/40 sec at f / 4.0
Focal Length	12 mm
Focal Length 35mm	18 mm
Exposure Bias	- 2 EV
ISO Speed Rating	ISO 3200
Flash	Did not fire
Exposure Program	Manual
Metering Mode	Pattern
Make	NIKON CORPORATION
Model	NIKON D300
Serial Number	3012096
Lens	12.0-24.0 mm f/4.0
Artist	Peter Krogh
Software	Ver.1.00
GPS	41°32'38" S 145°58'22" E
Altitude	800.8 m

Sync Settings Sync Metadata

Web Images Maps News Shopping Gmail more Sign in | Help

Google Maps -41.54412167,145.97305333 Search Maps Show search options

Find businesses, addresses and places of interest. Learn more.

Print Send Link

3336 Cradle Mountain Rd, Middlesex, TAS, Australia
Address is approximate



Cradle Mountain Rd

Middlesex

© 2008 Google Report a concern

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.