

GEPHOTOGRAPHY AS A SUBFIELD WITHIN THE GEOSCIENCES

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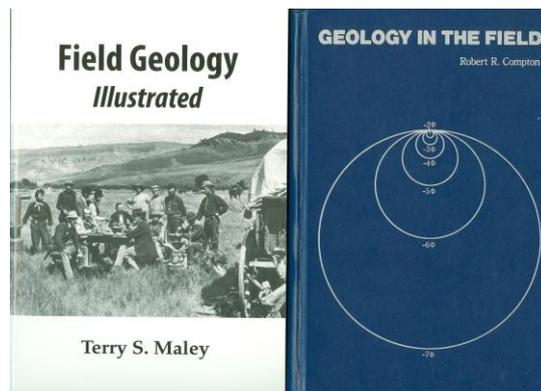
Colorado State University

0. Motivation
 1. About the term geophotography'?
 2. Should we recognize this subfield?
 3. What IS geophotography?
 4. Good geophotography
 1. Focus & sharpness
 2. White balance
 3. Exposure
 4. Depth of field
 5. Add life
 5. Where to go from here?



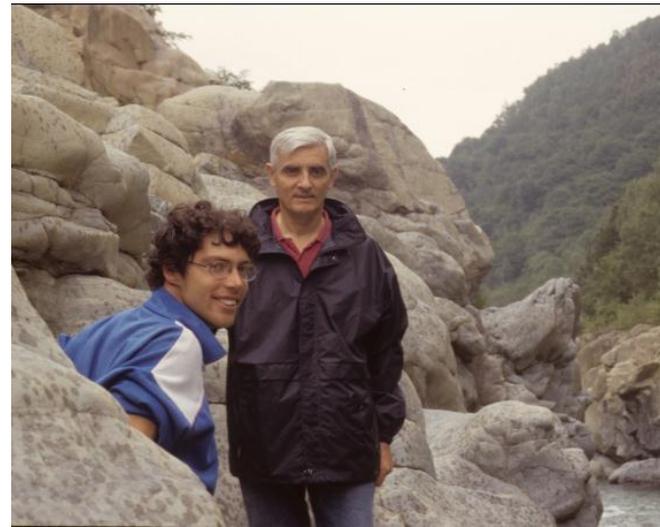
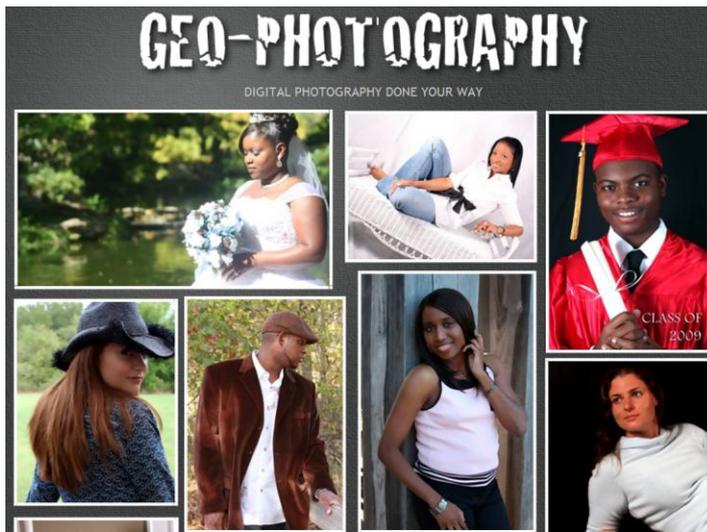
0. Motivation

- Photography is pervasive in geology (teaching, research, outreach).
- Geoscientists visit amazing places, but often return with mediocre photographs.
- “Photographs...show features exactly as they are, thus being the most convincing kind of graphic evidence.” – R.R. Compton
- An explosion of photographic techniques...harder now?
- Rarely is any training afforded or forethought given to photography.



1. About the term 'geophotography'

- Can we use the term 'geophotography'?
- Virtually no uses of the term
- Marco Beltrando
- Casual uses in various ways, usually something to do with the earth and photographs



2. Should we recognize this subfield?

- Attaching 'geo-' implies a subdiscipline, or branch, or field, or aspect of the broader science.
- There are good reasons to *avoid* a proliferation of terms, and sometimes the subdisciplines they imply.
- However, delineation within scientific fields can facilitate progress, and helps promote *sharing of best practices and the recognition of commonly faced problems.*

- A common rubric would help unite pursuits that have commonalities, but not obviously so.
- Geophotography--an *aspect* of the geosciences?
- Once recognized, we can focus on the best tools & techniques.
- Thus, one doesn't have to become a *completely* well-rounded photographer to be a good *geophotographer*.



Good
news!

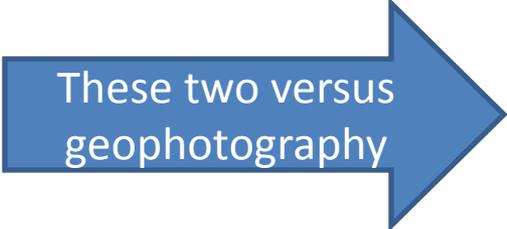
3. What IS geophotography?

Proposed definition: *Geophotography involves the use of light (visible, UV, IR) and realistic recording and processing of images* of geologic features and processes (or experimental equivalents), motivated by a scientific understanding or question**, in order to accomplish a specific, useful goal***.*

*cf. artistic photography

**cf. landscape photography

***versus taking snapshots



These two versus
geophotography

There is a continuum:

Emotion, drama, wonder, reaction triggering, ambiguity, imagination, depth, uneven framing, curiosity, ambiguous scale/size, possibly low HDR, incompleteness



"Mug shot"



Good
geophotography



Artistic & landscape
photography

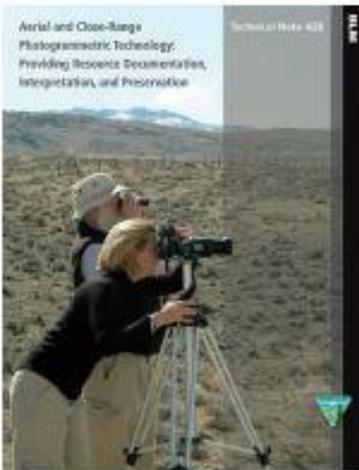
Balanced framing, subject centered, minimize 'depth', realistic (mid-day) color, scale included, standard point of view, sharp, stop action, completeness

Subdisciplines of geophotography?

- Aerial geophotography (airplane, helicopter, balloon)
- **Outdoor** (macro-, meso-, mega-scales), normally daylight
- Underground (caves, lava tubes, mines)
- Indoor (lighting): e.g., mineral photography
- Photogrammetry



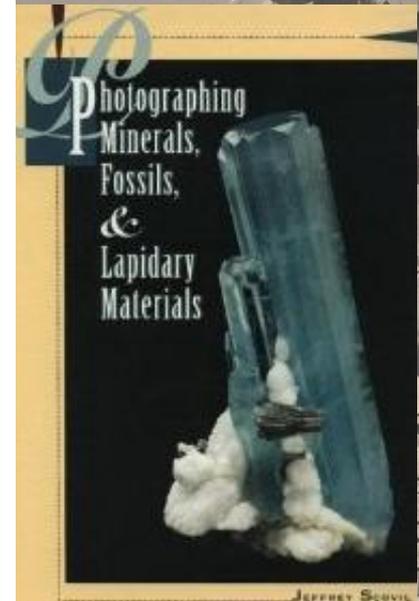
BLM Technical Note 428, September 2008



Aerial and Close-Range Photogrammetric Technology: Providing Resource Documentation, Interpretation, and Preservation

by Neffra A. Matthews, BLM, National Operations Center.

This document provides a general overview of photogrammetry, with separate sections focusing on traditional aerial photogrammetry and close-range photogrammetry. The appendices contain technical information on the equipment and suggested methods for capturing stereoscopic imagery. Their purpose is to assist field resource specialists in the successful completion of the imagery collection portion of a basic, close-range photogrammetry project.



4. Good geophotography (In general)

Good geophotography involves 4 aspects:

1. Planning (light, conditions)
2. Equipment (good camera with a variety of manual controls, good lens, tripod)
3. Execution (all efforts on-site)
4. Post-processing (Photoshop or equivalent)

No matter what your equipment, you can get better results.

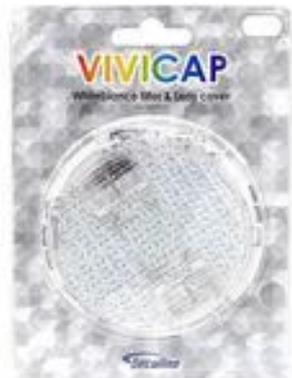
4.1. Focus & sharpness

- Control where your camera focuses
- Good glass makes a difference
- Clean optics (don't blow on lenses!), an excellent UV filter (B+W are good).
- Tripod
- VR/OIS helps
- Capture, creative, output sharpening
- Lenses have 'sweet spots'
- Take lots of shots....



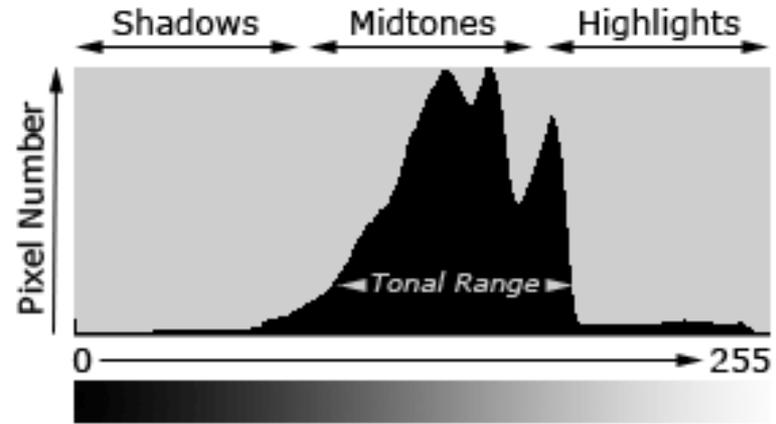


4.2. White balance



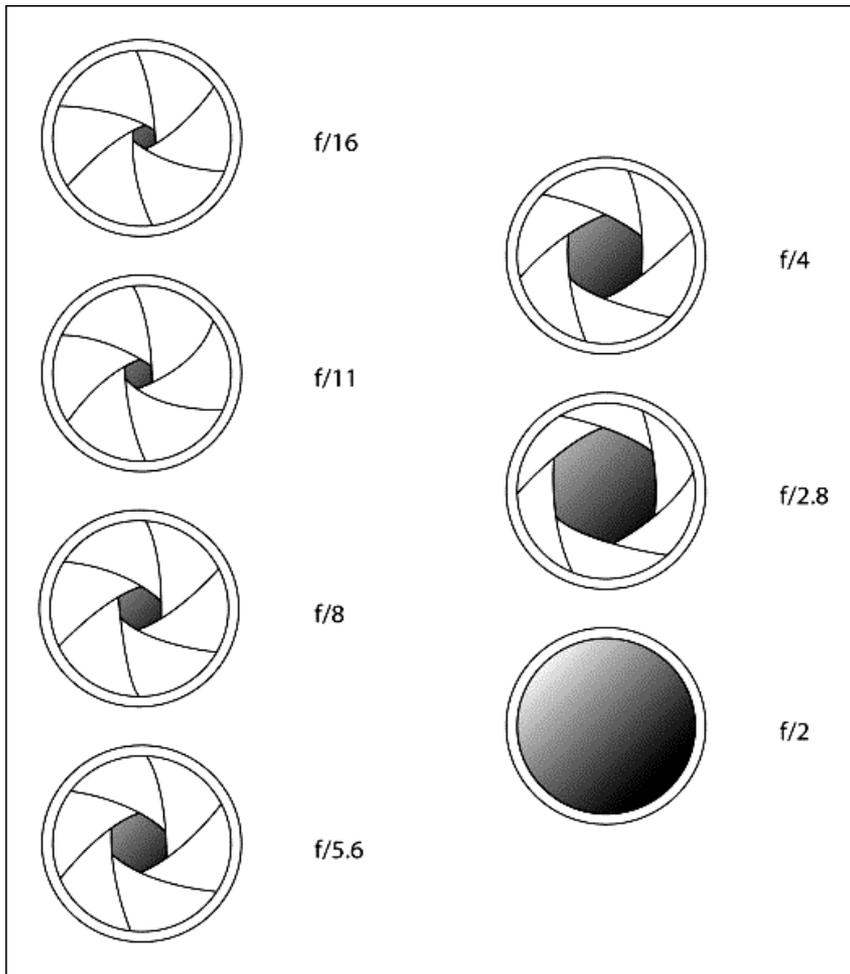
4.3. Exposure

- Know your histograms
- Make sure your images are correctly exposed on-site
- Hoodman LCD viewer (bright sunlight) (\$80)

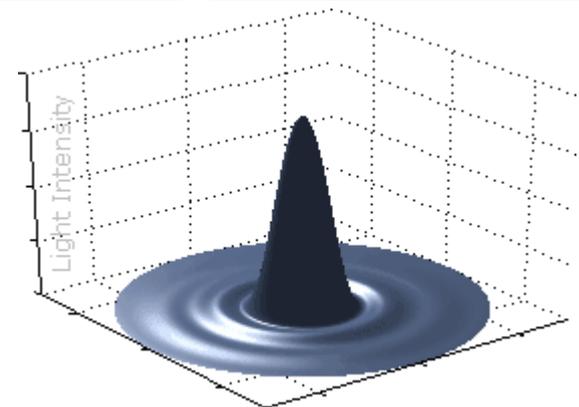
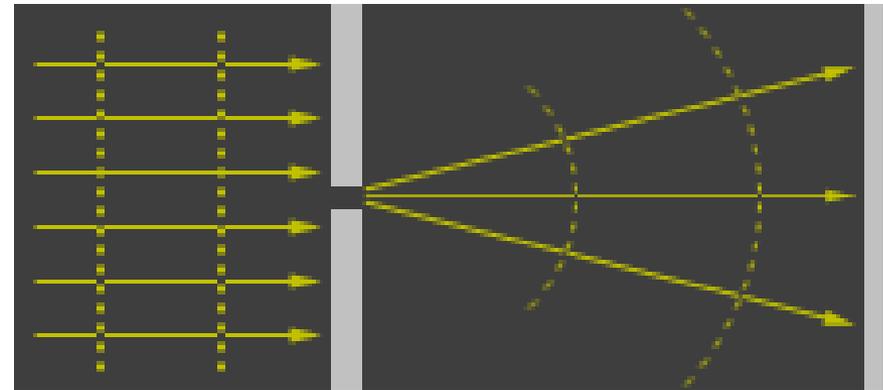


4.4. Depth of field—changing f/stop

- A smaller aperture is not always better, and can be substantially worse.



<http://www.cambridgeincolour.com/>



Gain of depth of field with
decreasing aperture...

F/2.8



F/4.5



F/7.1



F/10



F/14



F/18





F/22



f/10, f/14, f/18, f/22

4.5. Add life, action, humor







5. Where to go from here?

- I propose a GSA publication on Geophotography, and I welcome all to participate with contributions.
- A short course for the next GSA? (contact me if interested)
- Educational resources for undergraduate & graduate students.
- Theme session in the future on the subdisciplines of geophotography & how to do better (again, contact me if interested)

You might be a geophotographer if...

- Your camera bag weighs more than your backpack.
- You have the 'Nikon rumours' website bookmarked.
- You use the term 'good glass'.
- When you go 'shoot some rocks', there's no gunpowder involved.
- Your first instinct while falling down a hill is to break your camera's fall.
- You're familiar with Tokina, Tamron, Sigma, and Vivitar.
- You have a line of credit with B&H Photo in NYC.
- You have more obsolete cameras than obsolete computers.
- The insurance policy for your camera gear would pay out more than your life insurance policy.
- You've broken at least 3 UV filters.
- You have an mental debate over which tripods to bring on your next hike.
- You look out on a landscape and mentally crop using different focal lengths.
- You have an instinctive feel for the directions that would yield maximum polarization.
- You consider 'Photoshop' to be a verb.
- You remember trips based on what new photo equipment you got to use.
- "Getting ready for the field" means cleaning your lenses and filters, and clearing your memory cards.
- You've seriously thought about trading your car for a new camera.
- An ISO of 100,000 seems like a good start.
- You effortlessly speak f/#, SLR, ISO, CS5, RAW, NEF, LCD, CF, CMOS, FX & DX, RGB, VR, OIS, and FPS.

End