

Lecture Notes for Nature Photography

By

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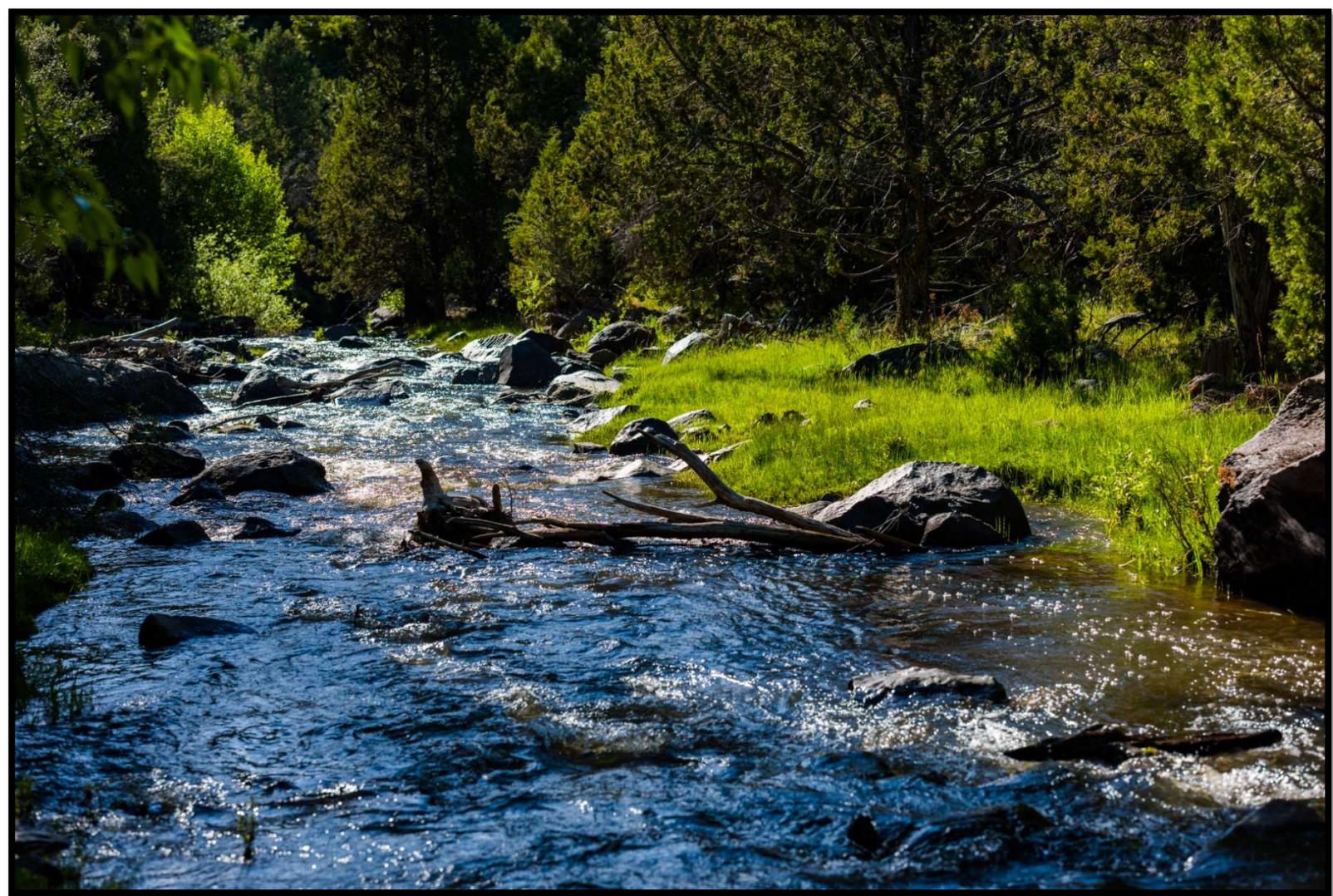
General Considerations

Tips and tricks that are hopefully not camera specific.

I will be using Nikon terminology due to my familiarity.



- 1) If you are shooting in RAW then selecting White Balance makes no sense; set to Auto and be done.
- 2) When using a tripod extend the lowest section an inch or two to keep the joint out of the sand.
- 3) No protective glass; use lens cap, lens hoods. Every physical barrier the light must pass through causes distortion.
- 4) If hand holding the camera use the 3X guideline; 3 X focal length of lens = minimum shutter speed.
 - a) Example: 50mm lens $3 \times 50 = 150$; so minimum shutter speed should be equal to or greater than 150.
- 5) Polarizer used on vegetation, rocks, water or during light rain to saturate colors and to remove glare. Can lose up to 1 – 2 f stops of light.
- 6) Hand hold polarizing filter with the threads facing you and rotate to determine if it will have a desirable effect.



This photo cries out to be polarized

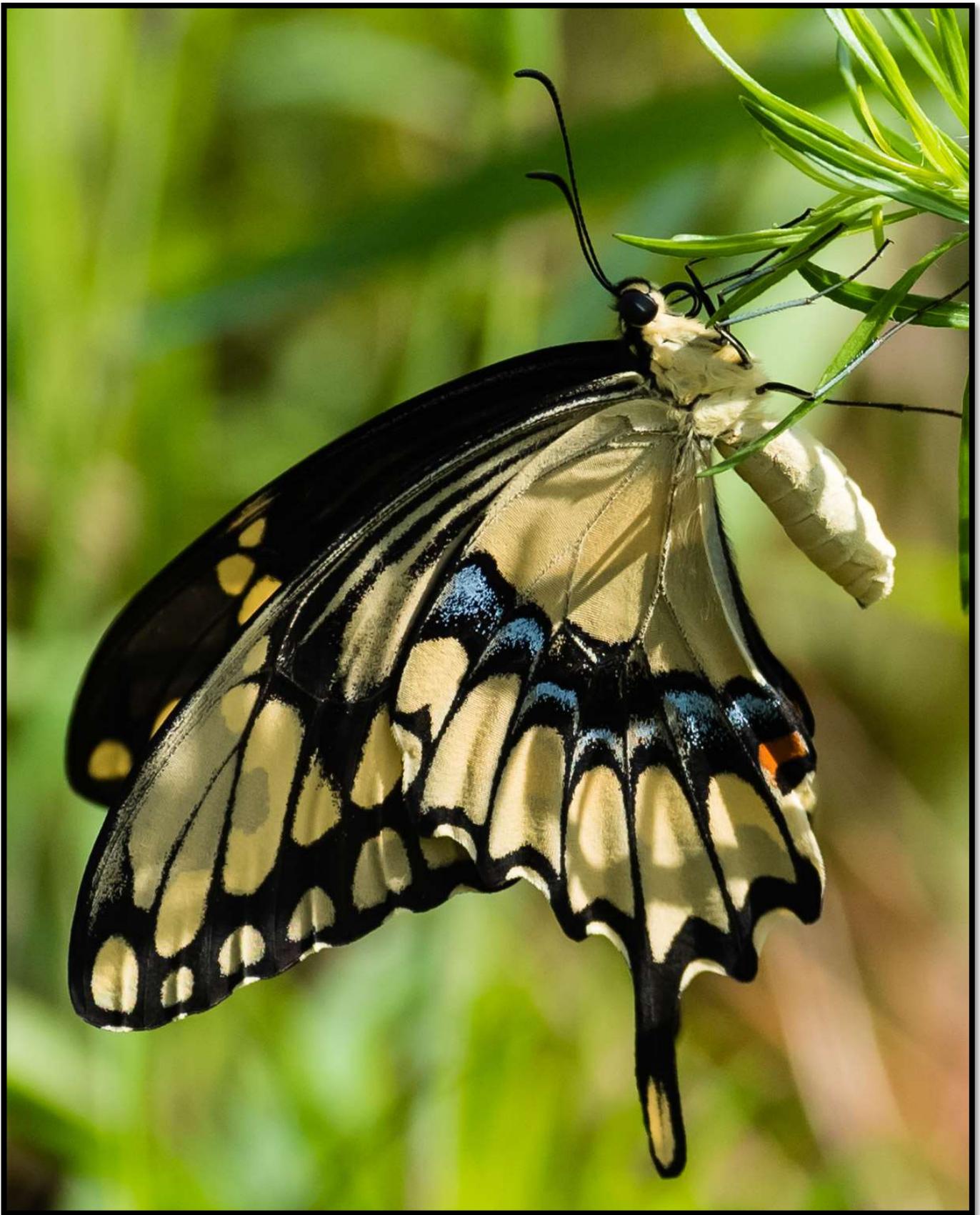


What is wrong with this photo? Hint: unintended effect of a Polarizer.

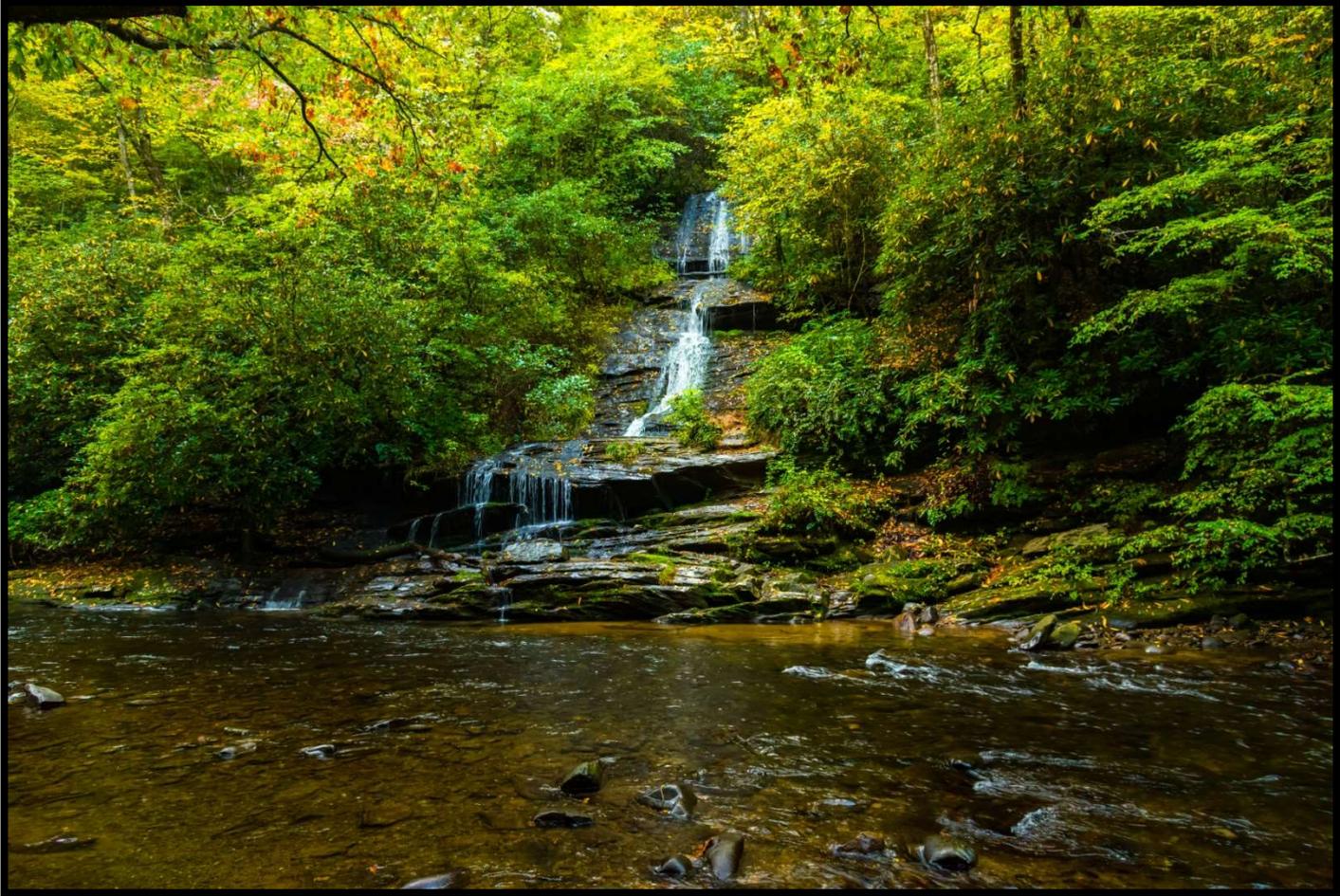


Shoot vertical strips and make a panorama (pano) composite photo.

- 7) Neutral Density Filter – reduces the amount of light into the camera
- a) creates longer exposures (useful for waterfall shots)
 - b) allows shooting with larger apertures for shallower depth of field
 - c) Example: shooting butterfly on a bright day. I want shallow depth of field to blur the background and isolate the butterfly on the flower. However, that would mean a large aperture which is letting too much light in. One way to compensate is to put a NDF on the lens to limit the amount of light in. Hence, I can open up the lens again to compensate for the loss of light and get the depth of field desired.



Could use a NDF to block incoming light which would allow a wider aperture to compensate loss of light

















- 8) High ISO introduces noise and lowers dynamic range of image.
Shoot with the lowest ISO possible.
- 9) Expose to the Right (ETTR) – for a dark subject matter push Histogram to the right to gather more data but do not clip highlights. Can use Exposure Compensation to do this (in Aperture or Shutter Mode).
 - a) Set Histogram on camera to show clipping
 - b) Use clip arrows
 - c) Use “Blinkies”

- 10) ISO 100 – 200 is the unamplified range of data capture (Native ISO); ISO up to 1600 - 3200 is usable.
- 11) Try not to use teleconverters with zoom lens; many optical parts in the zoom add to distortion.
- 12) Try not to shoot with apertures on lens set to maximum or minimum. I start by being “two clicks” away from either extreme.

RAW vs. JPEG

- 1) Every digital photograph is captured in RAW
- 2) Every digital photograph is post-processed
- 3) The only question is who or what does the post-processing
- 4) RAW is the preferred capture method for most professional nature photographers:
 - a) Captures the maximum amount of data, hence file size is larger
 - b) Does not have to be captured in a lossy manner
 - c) Allows for maximum post-processing flexibility
 - d) Does require an investment of time, money and effort
 - e) Photographer must do the post-processing
- 5) JPEG is a popular option
 - a) Less data is captured, hence file size is less
 - b) JPEG is, by definition, a lossy capture method
 - c) Some limitations on post-processing
 - d) Minimal investment in time, money, and effort
 - e) Camera does the post-processing

I shoot in RAW with lossless compression turned on. I capture the data with 14 bits of resolution (vs. 8 for JPEG). My typical file size is 50 Mb. RAW's fourteen bits equals 16,384 levels of quantization vs. eight bits for JPEG which yields 256 levels of quantization. Recommendation would be to use RAW if you have the time, money, and are willing to spend the effort. If you choose JPEG then I would recommend that you make sure that you are using the highest JPEG resolution your camera will allow.

Manual Mode vs. Aperture or Shutter Mode

- 1) Manual Mode gives complete freedom to photographer. You have control over all three critical parameters of a photograph:
 - a) Shutter – can chose to freeze image or allow motion blur
 - b) Aperture – controls depth of field (hence, your background detail)
 - c) ISO – image detail
- 2) Manual mode changes the amount of light into the camera (you can control all three variables and can set the camera up wrong).
- 3) Aperture or Shutter modes allow the same amount of light just a different mix. You control two out of three variables and the camera sets the third for consistent exposures.
 - a) Aperture mode: Set Aperture and ISO, camera adjusts Shutter speed. You may get unintended motion blur
 - b) Shutter mode: Set Shutter and ISO, camera adjusts Aperture. You may get unintended depth of field issues.
 - c) When using Aperture or Shutter can use Exposure Compensation (EC).
 - a) EC effects shutter speed in Aperture mode
 - b) EC affects aperture size in Shutter mode
- 4) EC has no effect on Aperture size or Shutter speed in Manual mode; does effect metering.



Motion blur on wings and feet



Motion blur on wing tips

- 5) Rarely do I use Shutter priority mode. Most keen on wanting to control depth of field.
- 6) I use Aperture priority mode when the control of depth of field is paramount and weather conditions permit (i.e. low winds). Otherwise it is Manual for me.
- 7) Manual mode example – set aperture and shutter speed (f/8 and 2000) then adjust ISO to get exposure correctly. Can use EC to help with metering. This is hard to do in a dynamic environment, i.e. birds flying around.
 - a) Alternative is to “Float ISO”. That is, set your ISO to control to auto-ISO. Camera will select ISO for you in Manual mode based upon Shutter speed and Aperture selected. This is what I typically do.
 - b) Manual mode with floating ISO is analogous to the Aperture mode and Shutter mode where two parameters are set and the camera adjusts the third parameter; in this case, the ISO.

Landscape Photographing



Mist on the Chilkat river

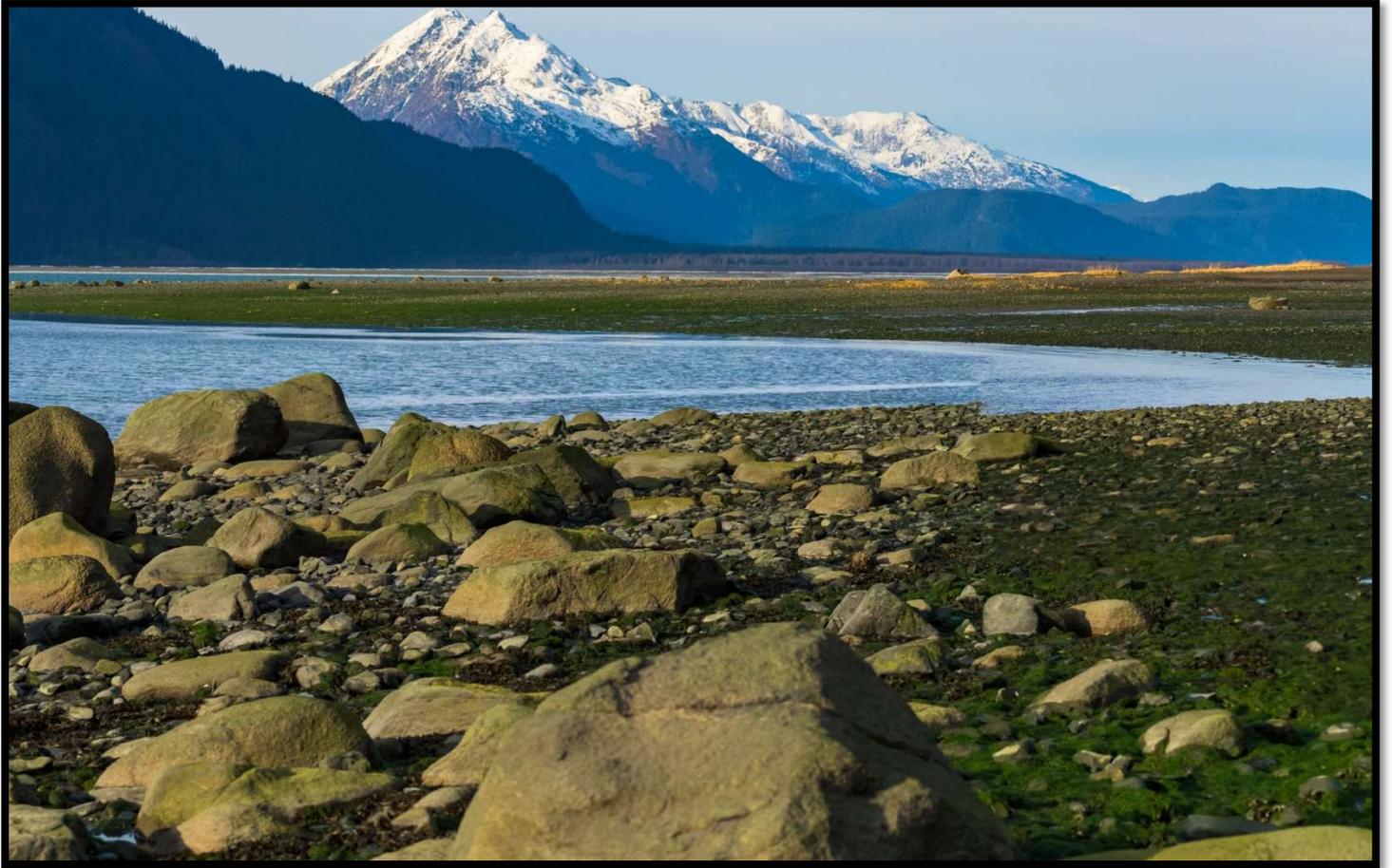
- 1) A tri-pod and cable release is a must. Forgot your cable release?
User timer in camera.
- 2) Shoot mirror up.
- 3) Close eye port after composition and metering. Or keep eye over view port during photo taking.
- 4) I generally use Manual Mode. Why?? Because I care about my foreground. What is and is not within the desired depth of field. A good foreground can make a photo; a bad foreground can break a photo. So, I need control over my aperture to set my depth of field. Also, the Hyperfocal Distance could come into play if there are near object and distant objects that are desired to be in focus. Thus, the aperture of the lens contributes to the placement of the Hyperfocal Plane placement. See below.

Even though it is a landscape photo there is often moving objects in the photo. Wind will be blowing trees, leaves on trees, bushes, grass, flowers, clouds in the sky, etc. in the image. Hence, I need to control the shutter speed. This desire to control both Aperture and Shutter can only be had in Manual Mode.

5) Hyperfocal distance, at its simplest, is the focusing distance that gives your photos the greatest depth of field. For example, consider a landscape where you want everything — foreground and background — to appear sharp. If you focus on the foreground, the background will appear blurry. And if you focus on the background, the foreground will look out of focus. To fix this you focus at a particular point between the foreground and the background, which makes both the foreground and the background elements of the scene appear reasonably sharp. This focusing point is called the hyperfocal distance. The hyperfocal distance of your lens will vary with aperture. Why? If your aperture is wide open, such as $f/2$, you will need to focus quite far away for objects at infinity to appear in focus. However, at a small aperture of $f/11$ or $f/16$, distant objects will continue to be sharp even if your lens is focused more closely. So, in this case, hyperfocal distance moves closer to your lens as you use smaller apertures. I use the 2 x distance rule to help set the focus point. If there is a near field object I will estimate the distance from the camera to the near field object. I then double that distance and set my focus point there.



Capital Reef at dusk

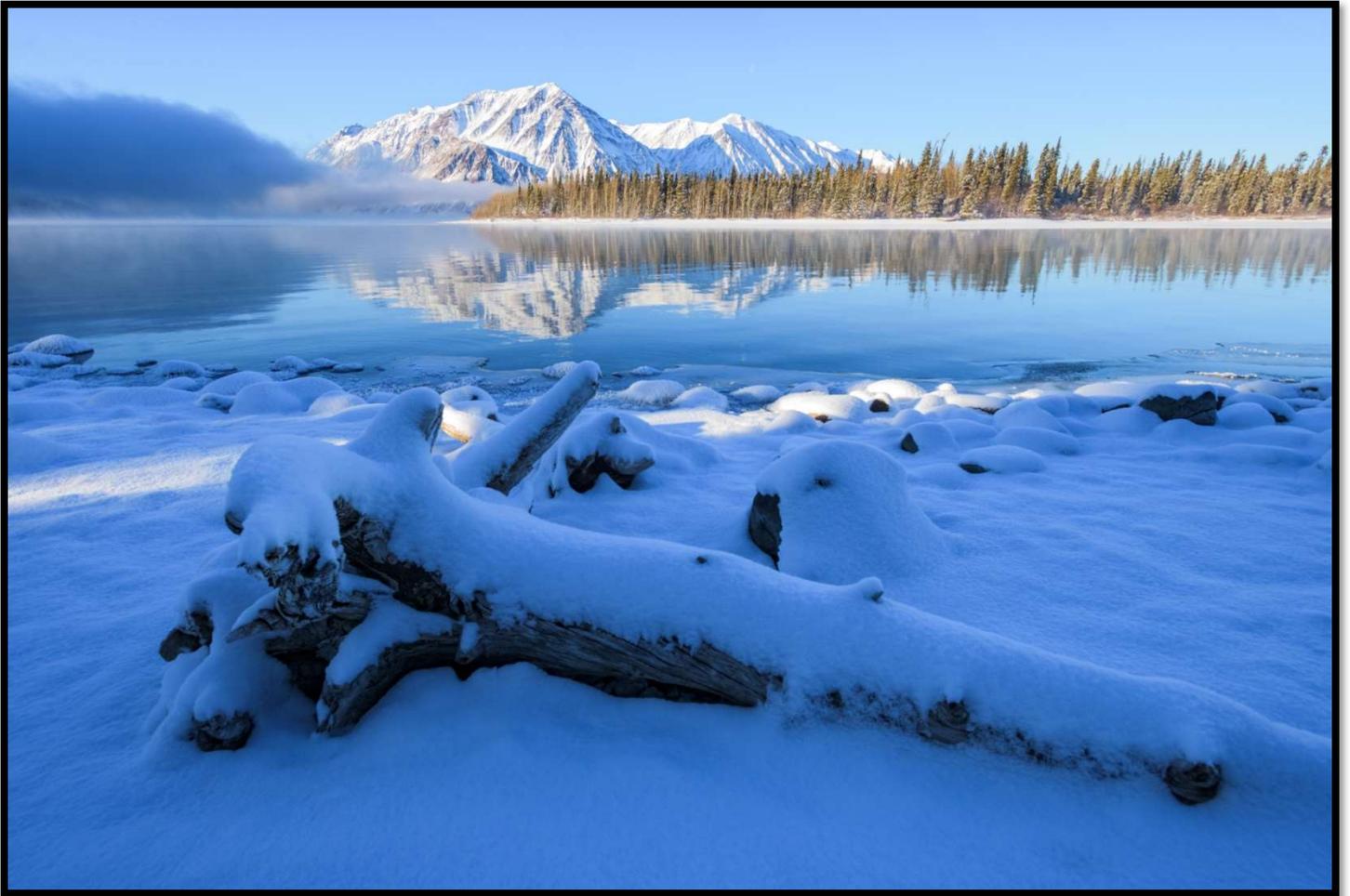








- 6) I use spot metering. This implies spot focusing as well. We are using only one spot out of the entire metering array. But which spot? Some cameras will allow you to pick a spot out of the metering array. It does not always have to be the center spot. I generally select a spot for metering purposes; I then manual focus to set the Hyperfocal Distance. See above.
- 7) Spot metering in Manual mode is generally done by select the brightest area and use that to set the tonality to the desired level (i.e. don't blow out your highlights). Watch for ambient light changes such as clouds moving and changing the light.



8) If you use Aperture mode for landscape I would still use spot metering / focus. Pick a spot in the image where I want to meter and focus simultaneously.



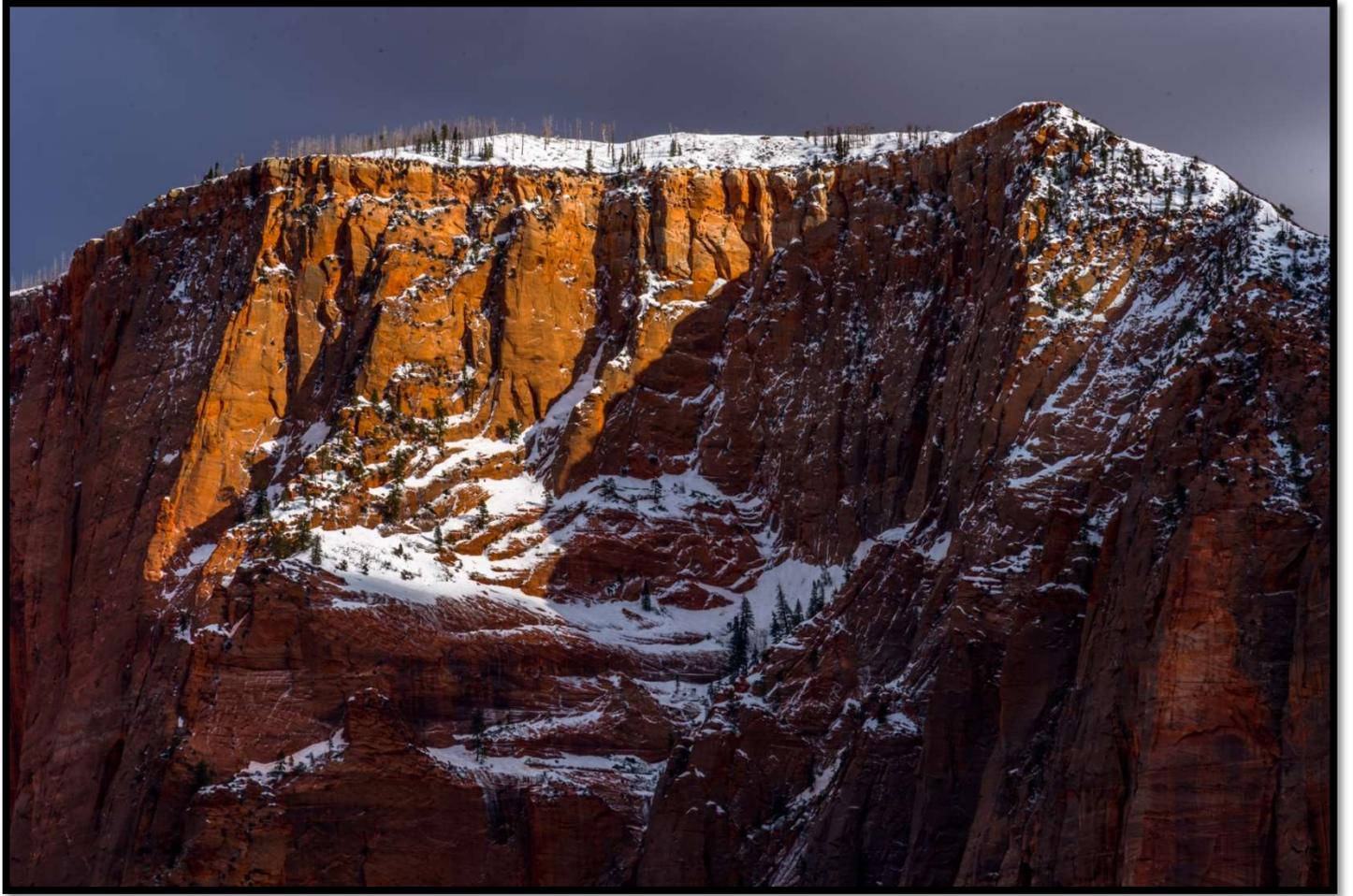


9) Angle of View (FOV) decreases as focal length of lens increases.
Short focal lengths make items in image smaller, longer focal length makes items larger.

10) Long focal lengths appear to compress the scene, short focal lengths (wide angle) to decompress it.











11) Depth of field controlled by four factors

- a. Aperture of lens
- b. Focal length of lens
- c. Size of subject being photographed
- d. Distance between camera and the subject

12) Depth of Field decreases as the focal length of the lens increases. Subject gets larger but depth of field goes down.

13) As you get physically closer to the subject the depth of field goes down. Magnification goes up but depth of field goes down. Macro photographers know this very well.

14) If the sky is uninteresting then tilt the lens down to put horizon line near top of image. Make sure foreground is in focus; distant horizon is less important. The closer to the foreground object the more critical the camera/tripod placement.

15) Landscape composition considerations

- a. Choose one subject, avoid clutter.
- b. Why am I taking this photograph?
- c. What do I want the viewer to see?









- d. Don't be lazy, move you, the camera, the tri-pod, change lenses, etc. to get best composition (Hint: take camera with expected lens and scout the composition site; move around and look through camera at various spots until you find one or two you like; then setup and shoot).
- e. What I like about this scene is _____, so I will use this equipment _____, and these photographic techniques _____.
- f. Good subject?
- g. Good lighting?
- h. Pleasing background?
- i. Good composition (change position, height, distance to object in foreground)?
- j. Good layers (foreground, mid-ground, far ground)?

16) I figure out the composition of the photo (see above). I select a lens which best captures the image. I select Manual Mode. I set the aperture and shutter speed to that which I desire based upon light conditions and wind; I then "Float the ISO" (auto-ISO).

- a. I set my spot meter point for exposure metering.
- b. If the spot metering point is good for my focus point (Hyperfocal distance) I then set my focus point (auto focus) by using the same point. This method is typically used when there is no near foreground to worry about.

- c. If the spot metering point and focus point are not the same (i.e. nearby foreground objects) I will set my spot meter point and then manually focus the lens to the proper Hyperfocal distance.
- d. I take a test shot and view the Histogram for exposure (ETTR if I can / must). I look at test image for composition (unexpected tree branch, rock, etc.) I make adjustments, generally the shutter speed. Sometimes the focus point. Often the position of the shot.

17) Let time pass. You will get different renditions of the same subject with the passage of time.









Action Shots



- 1) Two possible / practical modes of camera operation which are Aperture or Manual mode
- 2) In Aperture mode I set the aperture and ISO and the camera adjusts the Shutter speed. This way I can control the noise on the image but I give up Shutter speed control. I use this mode mostly when I want to blur the back ground of an image by controlling the depth of field using the Aperture and possible allow motion blur of the subject.
- 3) In Manual mode I set the speed of the shutter based upon the speed of the object moving and the focal length of the lens (longer lens = faster shutter speeds to control camera shake). I then set the Aperture for the desired depth of field effect. I float the ISO.
- 4) In either mode I use a small array of focus points; either Group (fixed five points) or Dynamic 9/25 in continuous autofocus mode. These same points are used for metering.
 - a. In Group mode all five points are used at the same time to acquire focus; no priority is given to any point. The closest point wins! So if you are shooting in a cluttered scene, if you put the 5 focus points on the subject of interest then the camera will focus on the chosen subject and ignore foreground and background clutter. I mostly use Group mode.





- b. In Dynamic 9 / 25 mode center point is used for initial focus acquisition; surrounding points are used to help maintain focus for moving subjects. Center point is given priority and the other point only come into play if the center point fails to focus. Good to use in uncluttered scene such as bird in open sky. I would use Dynamic if the subject is very fast and hard to track; I would have more point potentially (9 or 25) to track with.
- 5) I use back button focus; this may not be available on your camera. But if it does you should use it. Sometimes the camera will let you reassign a key function.







- 6) I use Continuous High shutter release (mirror slap be Dammed!)
- 7) Shooting with the lens open allows more light onto the sensor; this helps your Auto Focus system work well.
 - a. You are likely using passive Phase Detection AF
 - b. Phase detection uses contrast in the scene to AF
 - c. Low light conditions do not provide enough light to special AF sensors
 - d. Remedy is to open up the lens and allow more light onto the sensors; this changes the depth of field
- 8) In conclusion I normally shoot Manual mode (for depth of field and shutter speed control; I float the ISO), Auto-Focus C (continuous), Group mode (for declutter feature), back button focus, continuous high shutter release. I will switch to D9/D25 if the subject is fast moving and hard to track (only 5 point to track with in Group mode) or if the subject is in open space (buffalo in an open field).



