MUENCH WORKSHOPS

The Art of Luminosity

Understanding light to improve your photography

by Marc Muench

Muench Workshops Premier Series

Contents

Published by Muench Workshops LLC, 2020.

All photographs and text are copyright of their respective photographers and authors.

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means without written permission of the publisher.

Introduction: Light Is Magic

In nature, magical light is fleeting. It can transform a scene from ordinary to unforgettable, only to vanish into thin air. Will you be ready for it?

Most of us can recognize good light when we're paying attention. For me, watching the quality of light is a full-time obsession. I can't tell you how many times I've watched spectacular light shine on a shopping mall, shipping yard, or some other location I have zero interest in photographing. I watch it because I enjoy it, and for me, it's a challenge to find interesting light, even in parking lots. The question is, what makes the light so magical?

I judge light in two ways, first admiring the light that is obviously beautiful, that anyone would admire, even a non-photographer. And second, I especially admire the light where beauty is hidden and more challenging to recognize. What can make light more difficult to recognize is understanding how it can be properly edited to enhance a particular scene, something that requires post-processing skills. It also challenges me to learn more about complex atmospheric systems like the weather. Finally, it compels me to go somewhere new, to a different point of view in the hopes of finding inspiration. Moreover, I'm inspired to use all these skills to recognize and locate light.

We're all limited by what our eyes can actually see, the visible light spectrum. Visible light is only a specific range of the electromagnetic spectrum. Every other part of the light spectrum is invisible to humans. Within the visible light, we are able to see all the colors of the rainbow or—as we were taught to refer to them—ROYGBIV for red, orange, yellow, green, blue, indigo, and violet.

I believe we all have a natural sensitivity to light and the quality of it. Bright light lifts our spirit and low light can do the opposite. Contrast pulls our attention, while pastel colors make us contemplative, and the list goes on. Photographers have the opportunity to use this aspect of human nature as a powerful tool when creating images to tell stories or simply command attention.

What makes light especially challenging to photographers is when it is not what we had hoped. The shadows are too dark or in the wrong place. The color is wrong or the contrast is too high. When things finally get a little better and shadows form in just the right location and the highlights are striking the subject, but it's too dark, what will your camera settings be?

In these situations, you may struggle to select the correct camera settings, and as a result, your image may not match what you envisioned.

To help you improve your images through a better understanding of the effects and use of light, I want to share my knowledge and experience in three parts. I'll begin with the technical and end with the creative and fun.

Part One covers the technical aspects of light and your camera's ability to record it. I introduce you to the greyscale, histogram, and light meters, all important topics to review even if you've studied them previously.

Part Two helps you with one of the most challenging aspects of photography: seeing the picture before you capture it. This is where the creative process begins, long before you snap the shutter. I explain the different qualities of light in the natural world, noting that capturing perfect light in your photograph does not require perfect light in the field. However, it does require you to have the ability to see the light as your camera will record it. I also describe how to pre-visualize the dynamic range of the scene so you can capture lighting conditions and process the photograph to make the most of the light.

Part Three dives into post-processing your images to perfection. This is when you take all that you've learned in the previous two sections and shape your image with your own artistic vision. We review in detail how I processed several images, with increasing complexity, and including black and white processing.

I began my photography career when the world was using film. Back then, our final accomplishment was to deliver a perfect sheet of film, either to the printer or client. Then and only then, was our job complete. When digital imaging arrived, photographers had the tools to complete the entire circle, allowing us to learn and master the final step, post-processing. I have learned over the years that one must dive into the deep end to truly master the art of luminosity, and that's what we're going to do together. And once you do, you'll know how to make good light look great—and great light inspiring.

But before we get into all that, I want to share a story with you…

Where It All Began

I had been using digital technology for years without having any idea how or when the very first digital image was created. I first read a fictional account of what I thought might be the inception of digital imaging in the book "Space" by James Michener. He told of a young scientist working at the Jet Propulsion Laboratory (JPL) who created an image from small printouts of ticker tape. Later, I had a chance meeting with the marketing director of the JPL and asked him about the scientist from Michener's book. Did such a character and process exist? The director's eyes lit up, and I knew he understood what I was referring to.

He then shared a fantastic story with me.

The first digital image was made in the late sixties for NASA, as a way to record images of Mars. A scientist at JPL had invented a device that could scan a scene by recording it in tiny square segments. Each square was represented by three numbers, corresponding to the varying color densities of red, green, and blue. Those numbers were mapped to specific coordinates in the image. Because the squares were simply a mix of numbers, they could be transmitted back to Earth and reassembled. This eliminated the need to ship the film back to earth, which would have been a nearly impossible feat. As you might imagine, this process was highly classified at the time, and as a result, that young scientist's name has still not been released. However, his invention was the start of modern digital imaging technology. The director of marketing at JPL shared this image—still hanging in his office today—of the first digital image from Mars being assembled.

Each square of information contains three numbers: a value between 0–255 for each of the red, green, and blue color densities. These numbers were sent back to earth, then hand-painted on ticker tape to create this image of a Martian sunset.

Part One: The Range of Light

Current digital sensor technology works on a similar principle to those early attempts captured in the sixties while exploring Mars. The squares used to capture a color image of Mars are now called pixels, which is a word derived from "pic/pix" for picture and "el" for element. Pixels are also used to describe the light-emitting dots of a display.

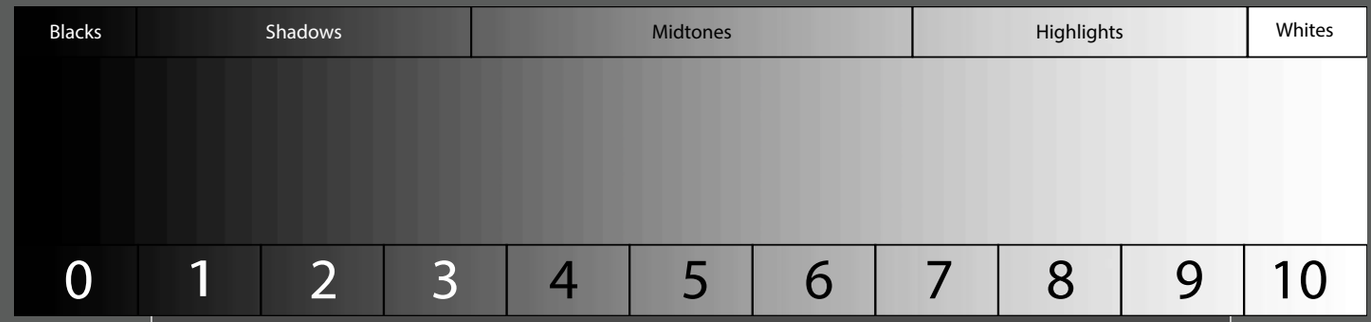
A pixel can have different meanings in different contexts but for our purposes we refer to the context of digital imaging. A pixel is the smallest point on a digital imaging sensor, also known as a sensor element. Firmware built into your camera combines data from every pixel to create the final image.

Every pixel in an image file contains three numbers called density values. Each density value describes the density of the primary colors: red, green, and blue (RGB). The density value for each color is a number between 0 and 255, where 0 is absolute black and 255 is absolute white. This is counterintuitive because the lower numbers represent darker values and the higher numbers represent brighter values. This system was designed to describe light transmission—the greater the density the less light transfers through a pixel. The darker the value the smaller the number.

One way to understand the system is by looking at the numbers on a grayscale. There are two purposes of the three density values in each pixel. One defines density and the other defines color.

Red	**0**	**Red**	**128**	**Red**	**255**	**Red**	**128**
Green	**0**	**Green**	**128**	**Green**	**255**	**Green**	**128**
Blue	**0**	**Blue**	**128**	**Blue**	**255**	**Blue**	**138**

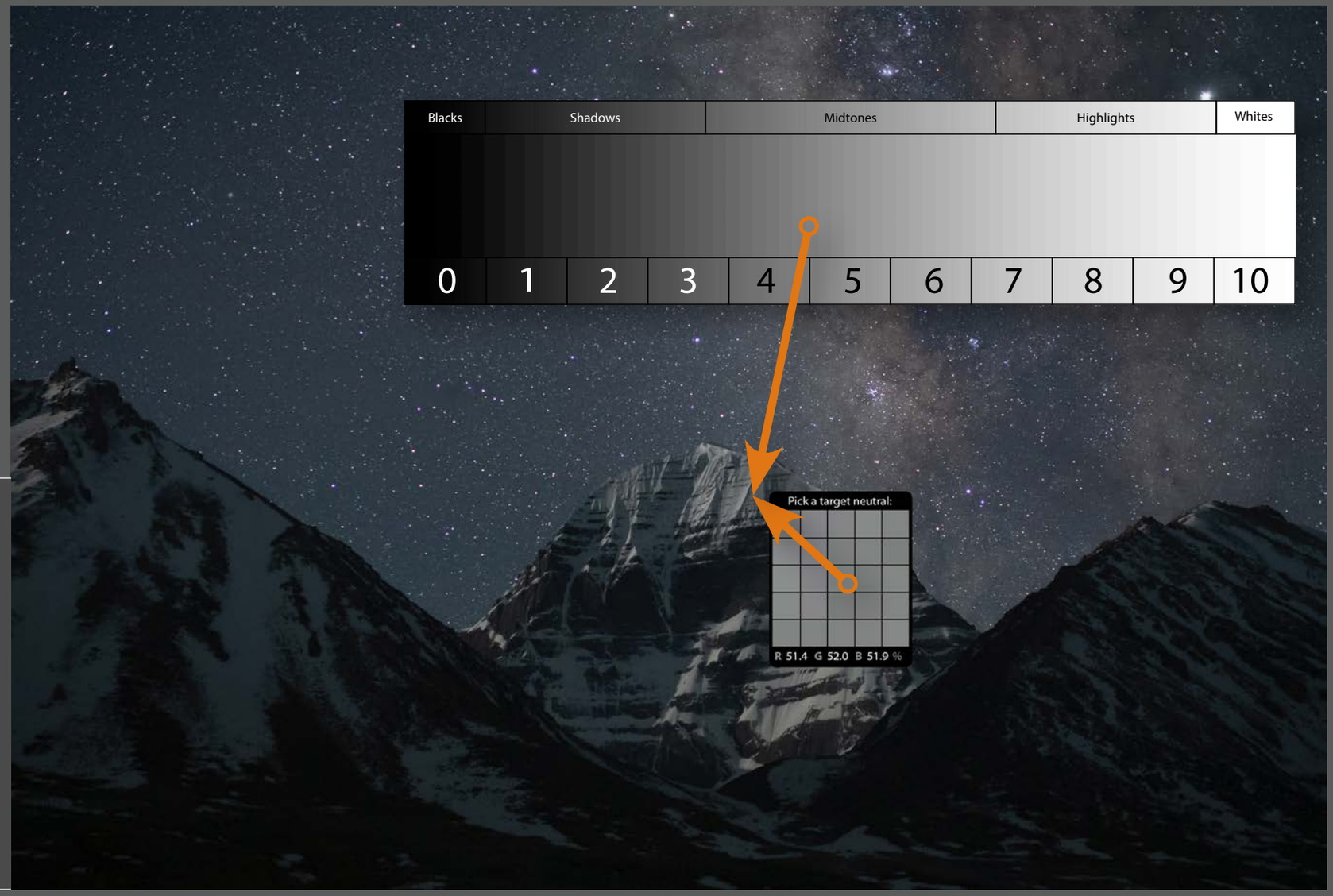
Notice that if all three color values are the same, there is no color cast and it is referred to as neutral gray. If one of the color densities has a different value from the others, then there is a color cast. For example, if a midtone pixel had a value of R128, G128, and B138, there is a blue cast. A 5 to 10-point shift in one of the three colors is typically perceivable.



This is a 55-step grayscale, with each gradation separated by five points. It also compares the Ansel Adams Zone System, which has 11 steps. On the top are the terms we use in Adobe Lightroom. You'll notice that black, shadows, highlights, and whites are all sliders in Lightroom. There is no midtone slider in Lightroom, rather it is called exposure.

Luminosity density values in each pixel are represented in a range from 0-255 in all digital imaging. Lightroom represents these values in percentages ranging from 0-100%. 0% equals 0 (black), and 100% equals 255 (white). In Lightroom, you can view the color density values for a given point in your image by using the White Balance Selector, located in the Basic Panel (keyboard shortcut W). Activate the White Balance Selector, then hover your cursor over the image. The grid that appears displays the numbers for the selected pixel, plus many surrounding pixels.

In this image, I selected a point with a density of 50%. This density is a midtone and in Lightroom is controlled by using the Exposure slider. This spot in the image is a snowfield in Tibet lit by the full moon at midnight on a very clear evening. I marked it on the grayscale below to illustrate how it applies to the density in this image. If you practice viewing these numbers in your images and plotting them to a grayscale chart you have a powerful method to begin understanding how that density will be displayed, in print and on digital displays.



Sunlight is sunlight, all around the world, making life a little simpler for photographers. Of course, there can be haze or clouds that block some of this light, but if it is a clear day, the luminosity is the same. Yet landscape photographers face a dilemma because there is often a difference between what is seen with the eyes in sunlight and what is captured by the camera as usable detail. The problem? Not all data captured by the camera is usable because of digital noise. You need to understand this limitation if you want to capture the best light in the best way to create the best images. Because the sun is the brightest light in our world, we need to understand how to use its luminance to effectively manage the dynamic range of an image sensor.

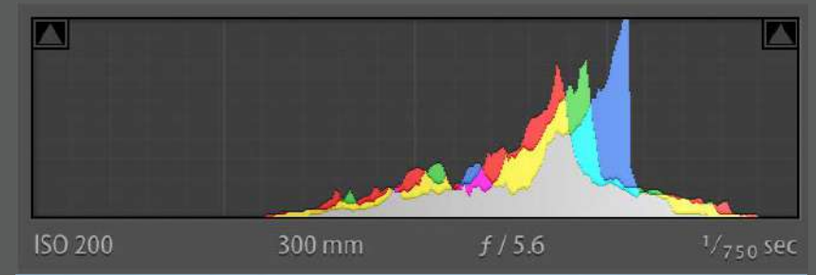
Dynamic Range is defined as the number of stops of light—from pure white to pure black—that a digital camera can record without creating digital noise. Each stop halves or doubles the amount of light in the exposure. When you increase the exposure by one stop, you double the amount of light in that exposure.

When it comes to dynamic range, don't believe everything you read. Sales media may claim that a camera's dynamic range is 14 stops, but details in the 3 darkest stops may be unusable because of excessive digital noise. While marketing efforts make the camera sound amazing, in reality, it may have a much smaller dynamic range than claimed.

When you point your camera at a scene, a specific contrast ratio must be captured. If your camera does not have the dynamic range to capture the required contrast ratio, it will not reproduce the scene as well as you had hoped. While the technology for all sensor sizes continually improves, larger format sensors typically exhibit greater sensitivity to light than smaller sensors. Larger cell sites are struck by more light, giving the sensor a greater dynamic range.

Sensors convert incoming light (photons) into an electrical signal used to generate an image file. The sensor chip contains pixels made of microlenses, micro-electrical components, and light-sensitive elements. A larger pixel gathers photons more efficiently than a smaller one, allowing for a wider dynamic range. However, larger pixels consume more space on the chip and require larger sensors, which increases the cost of producing the chip. So, while the increased dynamic range is nice, it comes at a price.

For cameras with a limited dynamic range, you can take a bracketed set of exposures and combine them. Bracketing means that you vary the shutter speed with each shot until the entire dynamic range is captured—use a fast shutter speed for the brights and a longer shutter speed for the shadows. This method is often referred to as high dynamic range (HDR). The HDR method increases the amount of light each pixel in the blacks and shadows receives so it decreases the amount of digital noise. Most full-size sensor cameras are similar in the amount of dynamic range offered. Although sensor sizes are equal, each manufacturer controls how the captured photons are used to create the final image we see. With the improved dynamic range of my camera's full-size sensor, I now use HDR less frequently because I often capture scenes with the appropriate contrast ratio in a single exposure.



Not all the scenes will push the dynamic range limits of our cameras, and there are many that will fall well within several stops of the available contrast ratio. This scene of Mount Everest was shot from 20+ miles away when the atmospheric haze combined with the distance softened the light and made it fit well within the dynamic range of a full-frame sensor camera.

The bracketed set of images above was shot with varying shutter speeds. Exposure times range from ⅛ sec to 8 seconds at ƒ/19. Below is the final image after merging in Adobe Lightroom. The seven images offered plenty of data to create a file with detail in every region of this image, and with a very high dynamic range.

Perfecting Your Exposure

Recording a perfect exposure for any scene is quick and easy using the histogram built into your digital camera.

The histogram is simple to understand. The left side of the histogram represents the darker values, and the right is the lighter values. The center of the histogram shows the midtones. The height of the graph indicates the number of pixels with values in that tonal range.

If your image is dark, then the majority of the data appears on the left (dark) side of the histogram. If your image is very light, then the majority of the data appears on the right side.

There are no "ideal" histogram shapes because many different looking histograms can represent perfect exposures. To determine if your histogram indicates a correct exposure, you must understand three terms:

» **Clipping:** This is when data "climbs" either edge of the histogram. Clipping indicates that you have exceeded the dynamic range of the sensor and some detail is lost.

» **Overexposed:** When data is clipped on the right side of the histogram, the image is overexposed and detail is lost in the whites.

» **Underexposed:** When data is clipped on the left side of the histogram, the image is underexposed and detail is lost in the darks.

While clipping should be avoided as much as possible, the good news is that today's modern sensors allow a little bit of clipped data to be recovered. Capturing the original file in RAW format simplifies the recovery of data in post-processing software such as Adobe Lightroom.

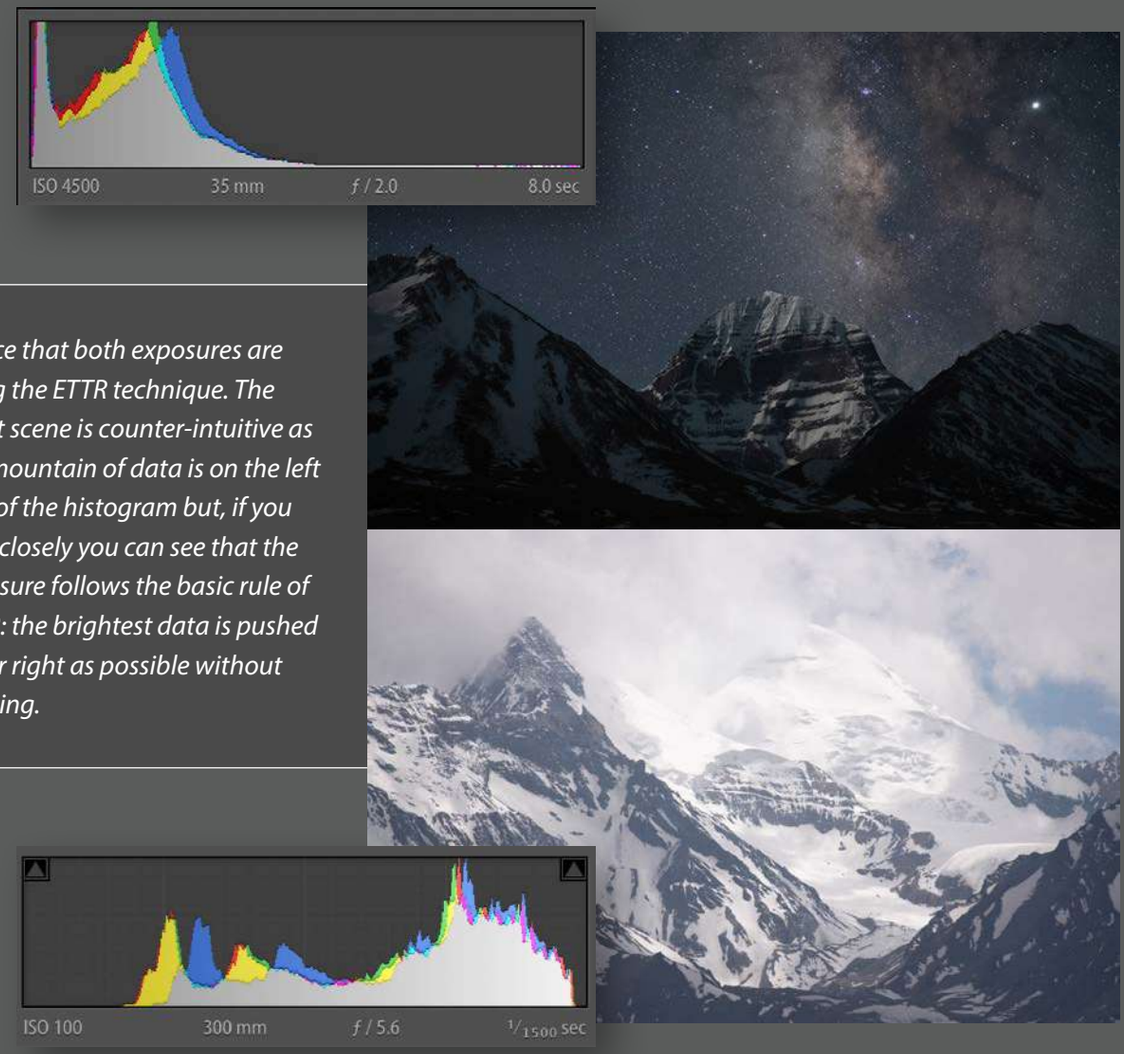
This scene of a killer whale breaching was captured at 1/350 sec, ƒ/5.6, ISO 800. This exposure was a compromise of settings to achieve a shutter speed which was fast enough to stop action while keeping the ISO low enough to obtain as much of the natural early morning color as possible.

Expose To The Right (ETTR) is a technique used by photographers to maximize the amount of data captured in an exposure. The right side of the histogram contains more data, and the more data you capture in an exposure, the better the end result will be. If your exposure is on the right side of the histogram without clipping highlights, then you have successfully exposed to the right. This will make your image look too bright most of the time, creating the necessity to post-process it to your intended luminosity. In addition, you do not want to simply increase your ISO or open up your aperture. Increasing the ISO creates additional digital noise, while changing your aperture affects depth of field and diffraction, making your image less sharp.

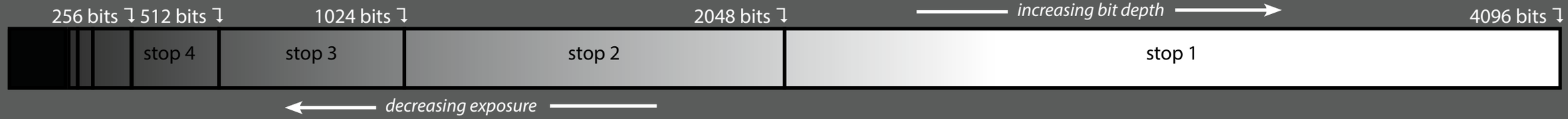
ETTR allows for several improvements in the final RAW file: greater signal-to-noise ratio, fuller color gamut, and more latitude during post-production.

The best way to understand the benefits of ETTR is to look at the bit depth of various areas of brightness in an image. The bit depth of the brightest value is 4,096. If you reduce the exposure to one *ƒ*-stop darker, then the brightest value in the image is reduced to 2,048, or one-half of the previous exposure. Move another *ƒ*-stop darker and the brightest value is reduced by another one-half to 1,024.

While there is no perceivable difference between 4,096 and 2,048 bits, reducing the bit depth by 50 percent increases the potential for digital noise and banding, narrowing the editing options. The issue is with shadows, where a difference between 64 to 32 bits is a significant decrease in data. When you lighten dark areas in post-processing, you also significantly increase digital noise. Dealing with shadows is what creates a balancing act between keeping your exposure to the right while maintaining a fast-enough shutter speed to capture action. By exposing as far to the right or as bright as possible (without clipping the highlights) your image—especially in the shadows—is the best result from the camera.



Notice that both exposures are using the ETTR technique. The night scene is counter-intuitive as the mountain of data is on the left side of the histogram but, if you look closely you can see that the exposure follows the basic rule of ETTR: the brightest data is pushed as far right as possible without clipping.



A handy camera tool when practicing ETTR is the highlight clipping warning function (commonly called "blinkies"). When activated, the camera LCD flashes a color or pattern over areas where data is clipped. It's a great reminder to adjust exposure. Note that even with the clipping warning turned on, there is no similar warning for underexposure. So, a scene can be captured with a low-contrast subject that does not show any clipping in the darks or whites but is still substantially underexposed.

There are two ways to achieve optimal exposure in your digital camera: using a histogram preview in your live view or digital viewfinder, or taking an exposure and previewing the file with the histogram displayed. I prefer the second option, as I do not like the histogram showing in my viewfinder while I'm composing because it overlaps important subject matter. When I have the time to do so, I prefer to record a file and then adjust for the second image.

Most digital cameras can present the histogram in two formats, either as a single graph representing all three colors or as three separate graphs, one for each color (red, green, and blue).

For the best results, use the three-color display, which is more precise, especially if only one color is clipped. Typically the red channel will clip while photographing the sunrise or sunset and the blue channel will clip when photographing during blue hour.

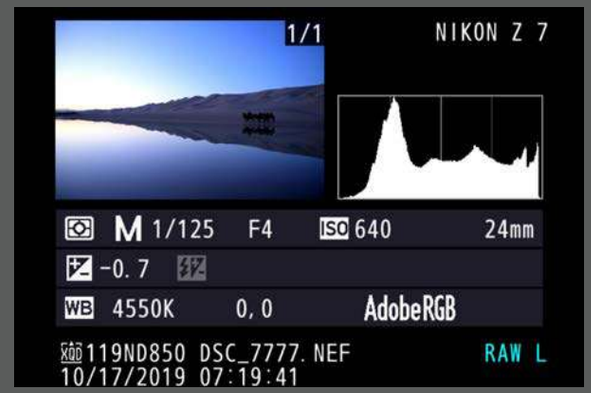
Remember:

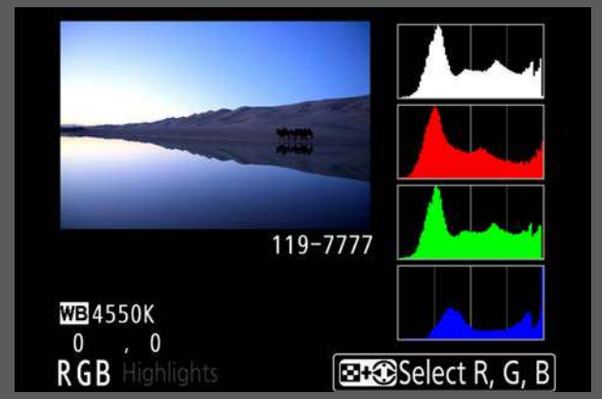
» ***Keep the data from clipping at either end.***

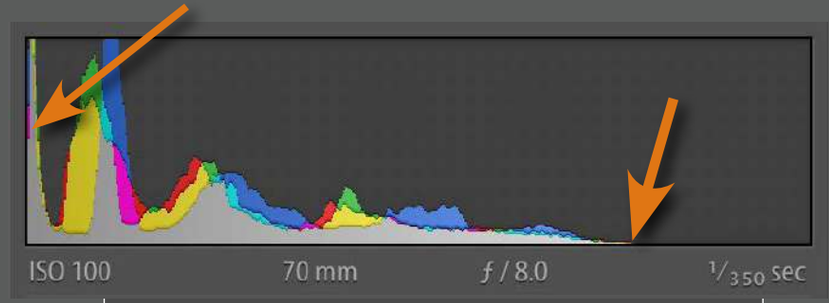
» ***Keep the data as close to the right/bright side of the histogram as possible (except for low-light exposure).***

» ***View your histogram in red, green, and blue (RGB), to know when specific colors are clipping.***

Exposing to the right is very helpful when optimizing your exposure for the scene especially when you do not want to use the HDR technique. The images on the next few pages display histograms you may see from typical landscape scenes captured throughout the day.

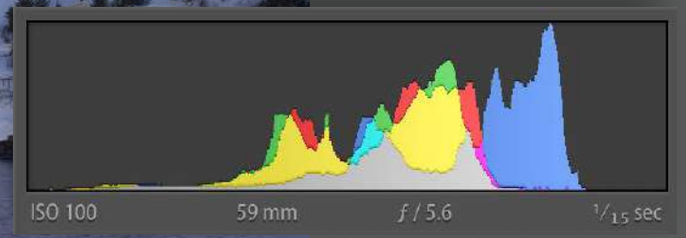




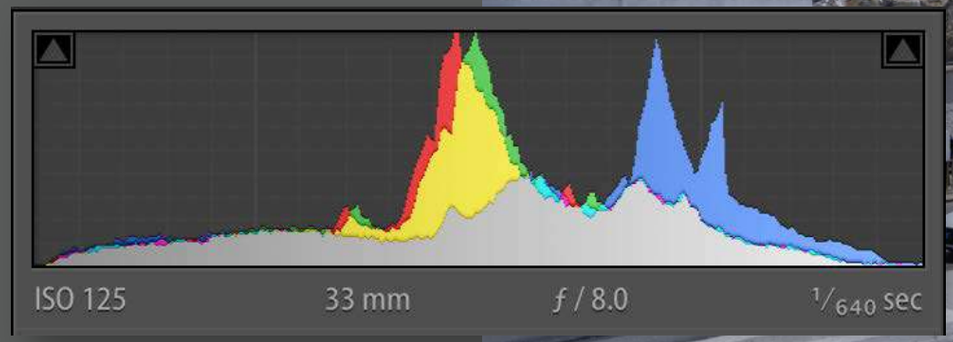


This histogram is clipped on the left side, indicating that the blacks are missing data. You can also see that the right side of the histogram is closer to the center or midtones. The highlights region of the histogram contains more potential information than the shadows or midtones.

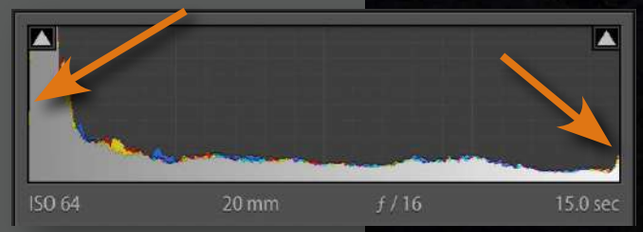
Low Dynamic Range. *This scene was captured in low light, before sunrise. Without direct sunlight, the only contrast in this scene is being created by the reflected light from the atmosphere.*

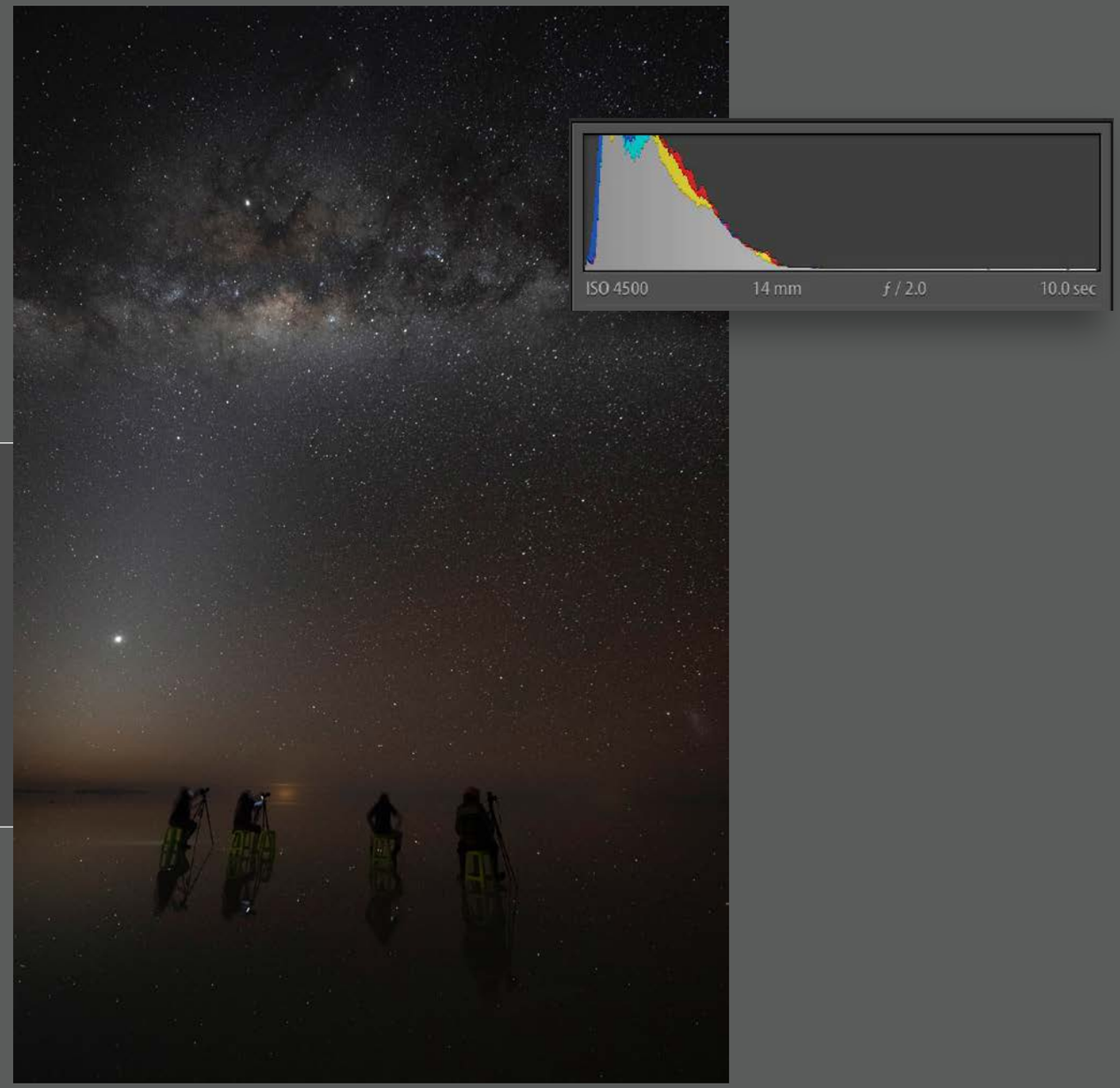


Average Dynamic Range.
In an average daylight scene, enough data exists to stretch from the left/dark side to the right/bright side, even with a little data clipped.



High Dynamic Range.
Most sunrise/sunset scenes looking into or towards the sun have more dynamic range than a single camera file can record. In these situations, it is best to capture the scene in more than one RAW image file, then combine them in post-processing. This is called ***bracketing****.*





Low Light. *When it comes to dynamic range, night or low light photography presents a unique challenge. There is actually plenty of dynamic range in most nighttime scenes, but our eyes aren't capable of seeing it. A digital camera, fitted with a large aperture lens, is capable of capturing the entire dynamic range. This is also a great time to view the histogram on the back of your camera. This will reveal how dark the file will appear at home on your computer, since the back of your camera is not an accurate preview of the image, especially when viewed in the dark.*

How It Measures Up

Before digital cameras, light meters were used by all film photographers. Some types of handheld meters are still used today, especially in a studio. There are two types of light meters available, incident and reflective. The incident light meter measures the direct/illuminant light from a source such as the sun or a strobe. The reflective meter measures the reflective/luminous light bouncing off the subject. All digital cameras now have built-in reflective meters. However, because an incident meter is always used away from the camera and held near the subject, its use is impractical for most photographers and impossible to build within a camera.

Incident meters are typically used in studios to measure the exact light from a source such as a strobe. This tells the photographer just how much light is striking any subject regardless of its surface reflectance. A reflective light meter measures the amount of light reflecting off a subject and bouncing back into the camera. The advantage of a reflective meter is that it accounts for the loss of light due to fall off or scatter between the subject and the camera. The potential problem with a reflective meter is that it is affected by a subject's reflectance, for example, a snowfield. If you were to take a reflective meter reading from a white subject such as a snowfield, the resulting meter reading would turn that snow to gray, or what is known as middle gray.

All light meters are created to measure light consistently. They are calibrated to measure what is referred to as neutral gray or middle gray. Middle gray is halfway between pure black and pure white. Middle gray is represented on a grayscale by the number 128, halfway between 0 and 255. Another way to understand middle gray is the way the printing industry measures it. For example, an 18% grey card reflects 18% of the light that hits it. This number is the geometric mean between white paper (95% reflective) and black ink (3.5% reflective). Gray cards are used in the field and studios to help obtain the best exposure settings.

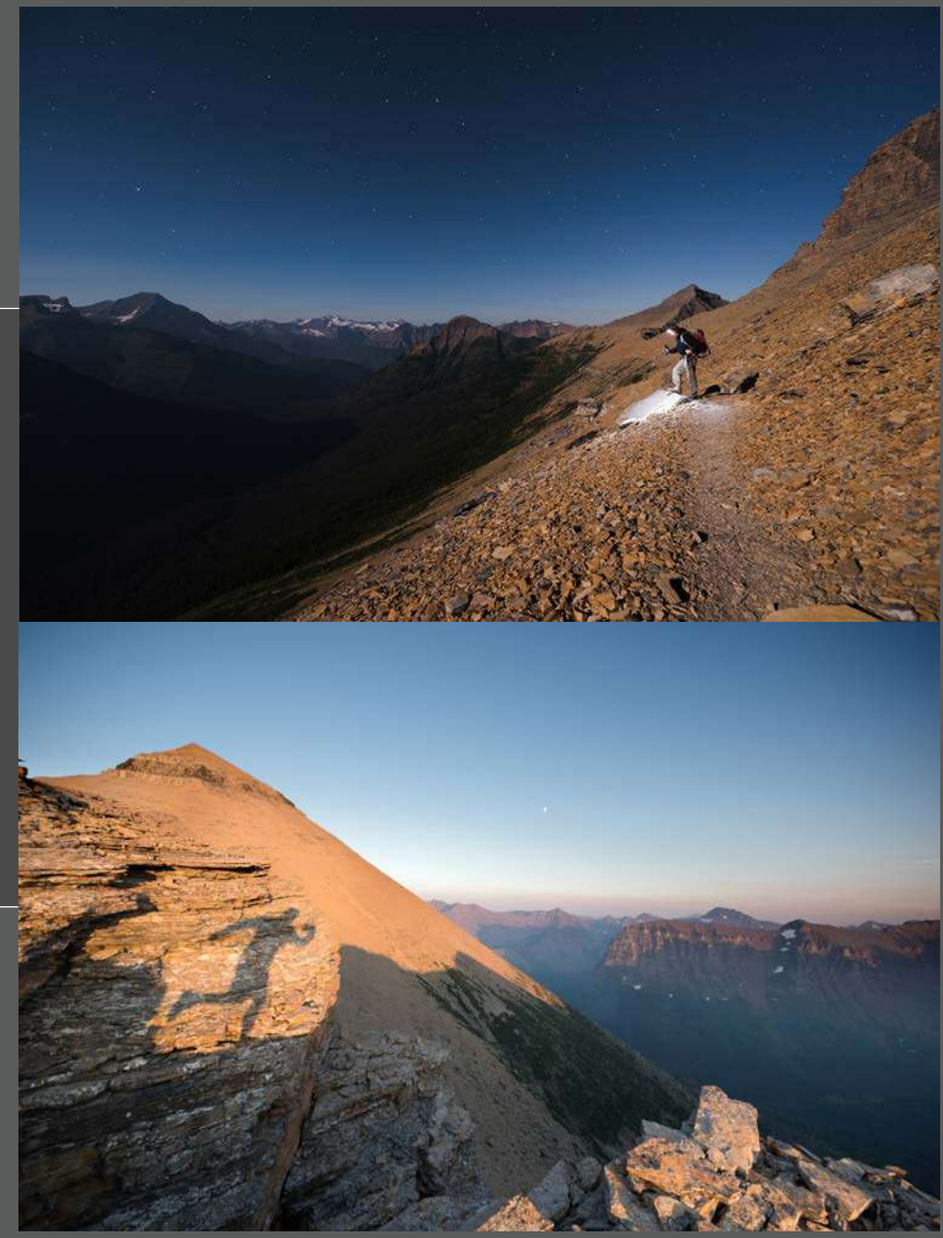
The darker version of the snowfield image was captured with a normal meter reading from a Nikon Z7 camera using the matrix meter setting. Exposure info: 1/1000 sec ƒ/7.1 at ISO 100. The brighter image was captured at 1/500 sec ƒ/7.1 at ISO 100.

To understand dynamic range, let's compare digital imaging with film. The average dynamic range of a sheet of film is between 5–6 stops. In today's digital cameras the typical dynamic range is between 8–12 stops, with some larger format sensors capturing up to 14 stops. The greater the number of stops between dark and light, the greater the dynamic range.

We often hear phrases such as "that photographer has an eye" or "that photographer can see a picture." These phrases refer to one's ability to pre-visualize the final picture before it is taken. First, you must be able to see the subject. Then you must be able to see the light. Then you must be able to see the composition. And finally, you must know exactly what you plan to do in post-production. Only then are you able to turn that golden nugget into a beautiful work of art. This section is about what it means to "see" the light. As I mentioned previously, making good light into a great image requires three skills:

- ***Recognizing the quality of the light in any scene, especially the contrast ratio.***
- ***Capturing the light for your camera with the optimal settings for the light in the scene.***
- ***Post-processing the file to achieve the artistic vision you set out to achieve when you took the picture.***

Acquiring these three skills takes years of experience observing light in the natural world and then reproducing it into a printed or displayed image. No matter how your work is displayed, your understanding of the light, your camera, and post-processing will improve over time—but only if you work at it!



Glacier National Park
Top:10 sec, ƒ/2.8, ISO 1600

Bottom: 1/180 sec, ƒ/8, ISO 400

Here are two examples of how many stops of light are present in recognizable scenes. Direct daylight is one stop brighter than the light in the shadow of a cloud. The light in a night scene recorded during a full moon with no manmade light is 15 stops darker than daylight.

Exercise: Seeing The Light

The following exercise will begin to train you to recognize the light's contrast ratio by constraining you to the limits of your camera's capabilities. Being able to determine the contrast ratio of any scene with your own eyes is the key to exponentially improving your photography. The tools we will use for this exercise are the histogram and the JPEG file.

A histogram can be used to show you the contrast ratio of the light in any scene, and if your camera has the right dynamic range to record it. If you work at it long enough, you will develop the ability to look at a scene and determine the contrast ratio on the fly.

The JPEG file is useful because of its limitations. If you develop the ability to create a beautiful JPEG image that doesn't require post-processing, then you are well on your way to seeing the light. The first step is to set your camera with these parameters:

- ***Program Mode***
- ***JPEG file format***
- ***Monochromatic picture style*** *Note that when you shoot in RAW+JPEG mode, the RAW file will still contain all the color information for later use.*

Once this is complete you can begin by looking for the perfect histogram. You must find light that fills the histogram from left to right—in other words, you want to use the full dynamic range of your camera—without clipping, of course! You are in Program mode so that you needn't be overly concerned about calculating the exposure. You can either capture the files and review them on your computer or simply capture and review them on your camera's digital display. It's also helpful to turn on live view with the histogram open, then begin framing scenes to notice when the histogram fits well within your camera's dynamic range.

As we discussed earlier, digital cameras are built to record the largest contrast ratio possible. The limit of the contrast ratio that a camera can record is called its dynamic range. If you learn to visualize the dynamic range of your camera when you are shooting, you'll be able to identify great light that fits within its own luminance range. If you're attempting to capture an image with shadows as dark as the moonlight and highlights as bright as daylight, you would lose a great deal of detail in either the shadows or highlights. Over time you will learn to assess the light in the shadows without the distraction of the highlights, and vice versa. With the ability to identify these characteristics of dynamic range and visualize them without the camera you will be well on your way to pre-visualizing your images.

Part Two: The Light

"It's all about the light!" How often do we hear this refrain when discussing photography? But, there are many times we don't see the light for what it is. This chapter is about seeing the most important aspect of luminosity—the light.

Capturing perfect light in your images depends on two things: your ability to see it accurately, and your ability to capture the light within the limits of the dynamic range of your camera. The light falling on a landscape can be a complex mix of direct and indirect light. It is critical for any photographer to understand how to balance complex lighting patterns into a single image. Including the light source in a scene increases the contrast ratio, makes it more difficult to calculate an accurate exposure, and often results in a photograph that is less appealing to our eye. Trained photographers often work with reflected light or "luminance" light, excluding the source in their compositions.

In nature, the atmosphere enhances the quality of the light. Clouds and moisture in the sky scatter the light, breaking it down into soft light. This scattered soft light results in lowering the contrast in the scene, typically creating the ideal dynamic range for your digital camera.

Capturing light isn't just about how much light exists, but also about considering the source and quality of light. Light comes from three directions, which are called:

» ***Direct light***

» ***Backlight***

» ***Sidelight***

In addition to these types of directional light, there is the quality of light, often described as soft, hard, and low light.

Soft light *is light with minimal contrast, or less difference between the brightest and darkest points. High thin clouds create very good soft light.*

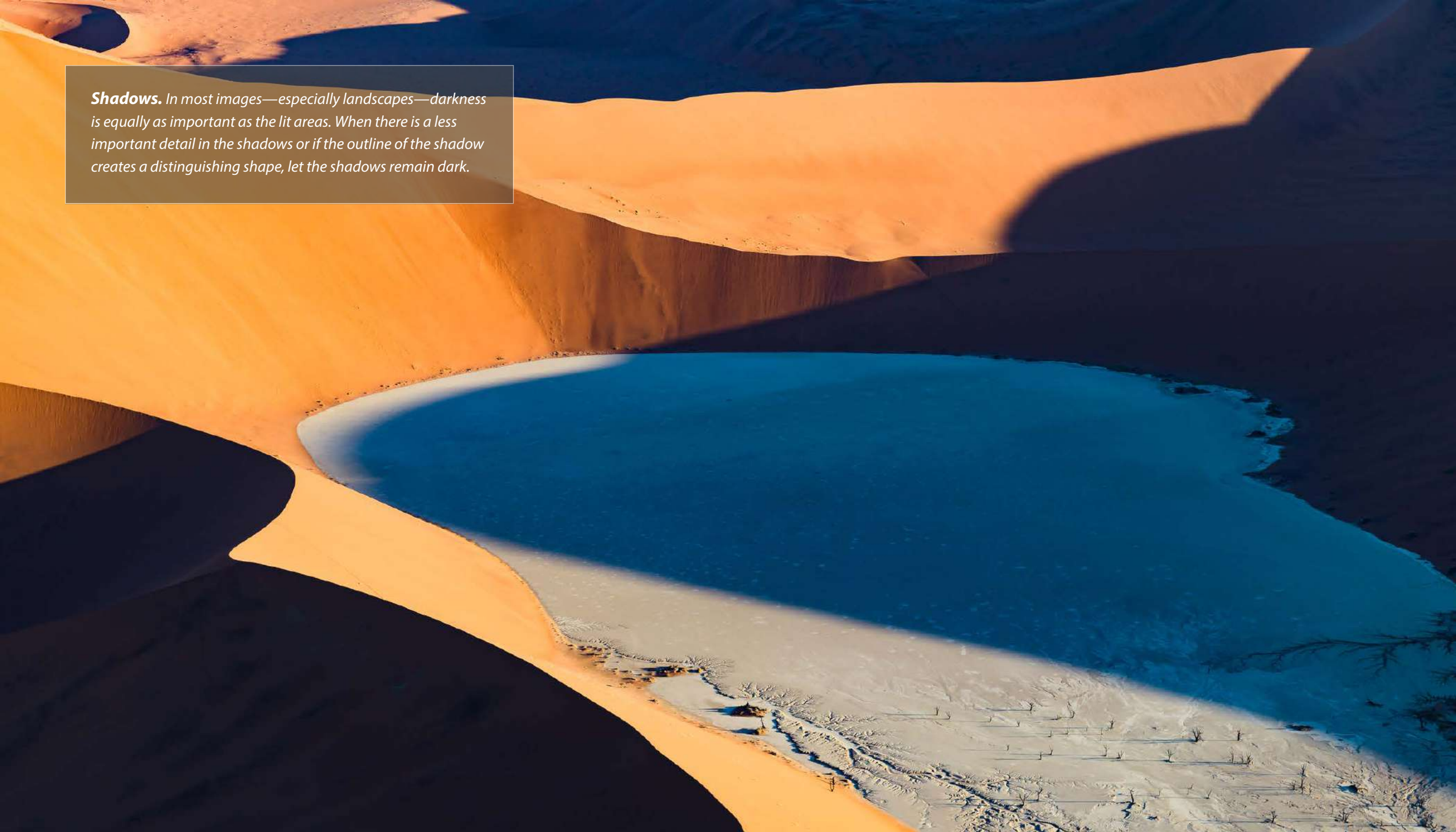
Hard light *is typically direct sunlight from about two hours past sunrise to two hours before sundown. However, this rule of thumb varies based on latitude. As you move away from the equator, the angle of light becomes lower, and that can make it softer.*

Low light *is very dim light at the limit of what our human eyes can perceive. Most low light occurs at night. The best way to see into dim light is to use your camera to capture it with a long exposure.*

Specular highlights *are regions that are too bright and will never hold detail, because they are outside of the dynamic range like the sun. In nature we often see direct sun reflecting off water, and most of these highlights are specular. Specular highlights are not to be considered when evaluating a histogram because there is no way for them to contain any detail. This scene of the crocodile in backlight shows how hard backlight with many specular highlights can create interesting images, even though some detail is lost in the specular highlights.*

Natural lighting effects. *Two of my favorite natural lighting conditions are spot and accent light. The only way to see these conditions is during mostly cloudy days. When holes in cloud layers open up just enough to reveal a beam of light, this becomes either spot or accent light.*

Transitional light. *The moment between sun and shade can occur quickly, requiring you to anticipate this particular light and click the shutter at just the right time. There are two ways this occurs. The sun must be obscured by a cloud or a distant mountain. If the clouds are moving fast, the timing is even more critical. This can be quite exciting on a spring day when small cumulus clouds are blowing by. This image was captured while the sun partially illuminated the foreground. I had more time to calculate this moment because I could watch the shadow line approach for 15 minutes before capture. This partial sun created nice soft shadows from the bushes in the foreground while lighting up the distant dunes with bright direct sunlight.*



Shadows. *In most images—especially landscapes—darkness is equally as important as the lit areas. When there is a less important detail in the shadows or if the outline of the shadow creates a distinguishing shape, let the shadows remain dark.*

Fill or bounce light. *These tall cliffs are being lit from behind by direct sunlight. The sunlit cliffs are also bouncing back that same direct light onto adjacent cliffs. Look carefully at the darker cliff on the left. You will see a nice warm glow on the angled faces of rock catching that bounce light from the opposite side of the canyon.*

Starlight. *Because of the amount of light pollution typical in most locations, there are very few places in the world where you can notice starlight. Light from cities as far away as 100 miles affects the atmosphere, causing a color cast on the horizon. One dark sky location is the salt flats in Bolivia, a remote location surrounded by hundreds of miles of rural Quinoa farms and high arid desert. On a moonless night with no interfering light sources, your eyes will begin to observe starlight. Created millions of years ago, this ancient light will be all you see.*

Drama. *In this scene of the Antarctic Peninsula, I've darkened the shadows above the sunlit ice to create drama. It adds an ominous feel to the scene, helping to create a scale for the massive size of the mountains.*

Silhouette. *This image is more about the dark steep slope the Mongolian eagle hunter is standing on than the sunlit background. The eagle hunter and eagle are silhouetted against the sky directly behind, creating the separation needed.*

Haze. *In nature, most contrast is created by subjects within the first 100 yards of the camera. Beyond that distance, atmospheric haze causes the contrast to be minimized. This haze can also be used to create depth. Subjects farther away from the camera are typically obscured in haze or moisture in the air.*

Pre-Visualization

Let's face it, the light is not always perfect. In these more common conditions, there are still many pictures to be created, and with an understanding of editing, you will be able to pre-visualize the potential. What helps me understand the light in these situations is to divide the scene into regions of similar densities. I first consider all the darker regions, then the midtone regions, and finally the highlight regions. Any value between 30%–70% is a midtone. Above those values are highlights and whites, below are shadows and blacks.

In this scene of the Dolomites, I have marked the various luminosities which helped me decide how I was going to edit during post-processing. Red indicates highlights where I will add contrast. Yellow indicates the region I plan to leave alone because I want the atmospheric haze to make the mountains appear farther away. Green indicates shadows where I will add a bit of contrast. White marks the region of shadows where I plan to increase luminance and turn it into a midtone. The white region will reveal the most noticeable edits.

The changes you see processed into this final image were actually in my mind when I clicked the shutter. You can see how the foreground is brighter, becoming more balanced with the light in the sky. The distant mountains are left with a little haze, creating some natural depth, and the sky is darker. The additional contrast to the sky helps clear any haze and highlights the dramatic clouds.

Most landscape photography occurs during sunrise or sunset. When I plan to photograph either, I sometimes break the rules and include the sun itself. But, I carefully capture the moment when the sun is barely showing above the horizon. I capture this exact moment for three reasons. First, the sun will create a special type of lens flare (called a "star") with all the rays pointing downwards rather than pointing in all directions. Second, the sun will add less contrast to the scene of the landscape in front of my camera when it is partially obscured by the horizon. The focal length is the third consideration when photographing a sunrise/sunset. If I use a very wide-angle lens, 24mm or wider, the sun itself will be tiny. By using a wide-angle lens, I am revealing more around the sun than the sun itself. It reveals a combination of the backlight, reflected light and soft shadows. Over the years that I've photographed the sunrise and sunset, I've become more interested in this light surrounding the sun itself. Eventually, many of my favorite scenes captured at sunrise or sunset were looking away from the sun.

As I became more intrigued with reflective light, I found myself working on cloudy days. The cloud cover forced me to observe non-directional light and color. We acknowledge color the way our eyes perceive it, and moreover, the way we personalize it. Not only do many of us see a particular hue of color differently than others, but this also has an effect on our perception of the image we're viewing.

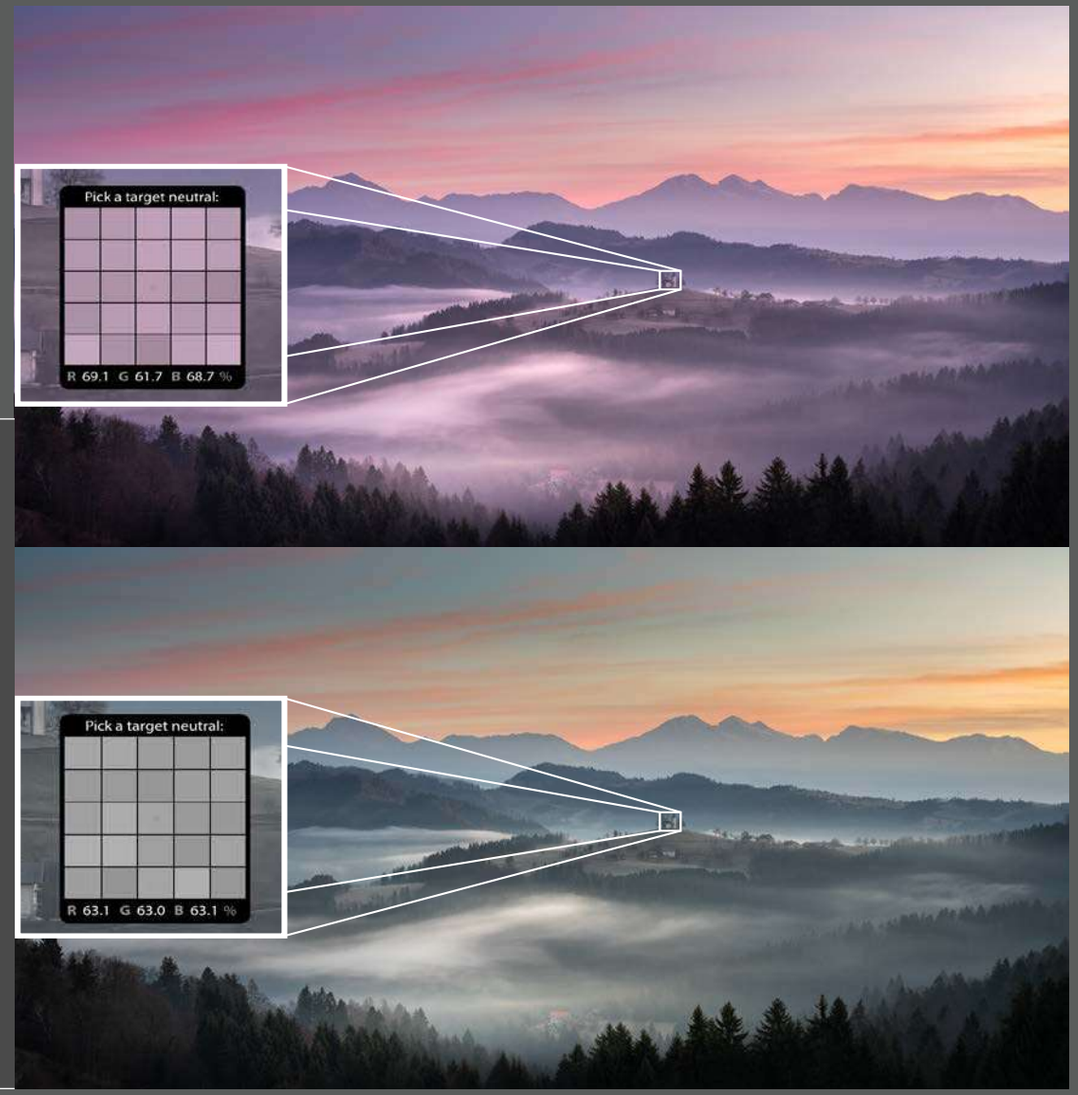
Contrast has a way of overshadowing color. For example, if you look at a grass lawn on a sunny day, it looks green. If you look at that same lawn on a cloudy day you will most likely notice all the different shades of green, some with yellow and some with darker greens. This low contrast light helps us acknowledge subtle nuances in colors. Acknowledging subtle differences in the color of light, especially ambient light, is critical to understanding light itself.

On this cloudy day in Svalbard, a fog bank arrived scattering the harsh sun into a soft cast. Notice the blue light in the fog being reflected up from the surrounding ocean. Also, notice the yellow in the bear's coat. Polar bears often get seal oil stuck in their coats. This seal oil grows algae and gives the coat a yellow-green cast. All these colors would not be as apparent in full sun and the coat of the polar bear would appear white.

Blue hour is a great example of a natural color cast. During this time of dawn and dusk, the sun is just far enough below the horizon that the sunlight's blue wavelengths dominate the spectrum because the longer reddish wavelengths are absorbed in the earth's ozone. This blue cast of light is natural and must be acknowledged. And once you do, you see that it's creating a blue cast on everything around you.

When you become aware of color casts, you'll begin noticing similar subtle differences throughout the day, for example at sunrise versus an hour later. As the sun rises through the earth's atmosphere, the color of the sunlight becomes closer to white and less red.

However, you can determine how much of that blue cast you want showing in your final image by setting a manual white balance in your camera or changing the white balance in your post-processing software. The color cast can be described using the Kelvin color scale, in which the higher numbers are bluer and the lower numbers more yellow. You can reference a Kelvin color scale to view all the potential options. The temperature on a sunny day is 5,500 Kelvin. The temperature of an incandescent light bulb is 2,700 Kelvin, and the temperature of a blue hour is around 10,000–15,000 Kelvin, depending on your latitude. Most editing software includes a tool to adjust the Kelvin white balance in an image. The tool in Lightroom is in the Develop module, and is located at the top of the Basic Panel and called Temp and Tint. These two sliders are designed to compensate for a color cast. For example, if you move the slider to a lower Kelvin number, you are compensating for an image captured in a setting with a much higher Kelvin setting. There are two sliders giving you the opportunity to move the white balance point within a color sphere. This allows you to move that point up and down as well as back and forth.



This image was captured in the early morning during a pink cast. The sun was still below the horizon and reddish sunlight was striking the high clouds, which were reflecting that same reddish cast onto the entire scene. The image above was captured using the auto white balance in the camera. The image on the bottom shows what happens when a manual white balance is set on the white wall of the church on the hill. Notice how much pink is removed from the scene. The bottom version has an accurate white balance set for this scene. The subjective decision every photographer must make is how much of this natural cast they should leave in the final image.

Direct, middle-of-the-day sunlight is difficult to photograph. Shadows are dark, and there's usually little contour in the landscape and lots of haze. There's often so much haze that it's difficult to see through. These conditions are definitely not something I look for, but in spite of all that, there can be some interesting photographic opportunities. First, I often think in black and white. I do this because the colors are typically oversaturated with all of the light, and the haze is easier to remove in black and white processing. This all depends on where you are and if there is enough visibility. Wildlife, interesting geology, and dynamic shadows can all have photographic merit.

During these times I find several aspects of the light intriguing. A cloudless sky becomes a blank canvas to be used as a background. Subjects can be placed compositionally against this backdrop and profiled. Shadows can be used as graphic elements to lead the eye, where no detail is needed.

Nikon D850, 70-200mm ƒ/4 lens, 1/3000 sec, ƒ/4.8, ISO 400

A profile of a Rocky Mountain sheep ram with a commanding view towers over the Colorado River in the middle of a 100°F day.

Nikon Z7, 24-70mm ƒ/4 lens, 1/125 sec, ƒ/7.1, ISO 64

Desert date (Balanite) tree growing in the grassy fields of the Maasai Mara National Reserve in Kenya. At one point these trees must have created a forest, but over the past 20 years, elephants and wildfires have thinned that forest into what is left today, the spotted plain of the Maasai Mara.

Part Three: Processing For Perfection

We've discussed the best ways to recognize great light, the best camera techniques to capture it, and understanding when an image needs to be post-processed. Now it's time for the last step.

Over the years I've developed a method for producing images that have the correct contrast ratio for printing or publishing to the web, and also incorporate my own style. This mostly subjective part of producing your personal work links with your pre-visualization and camera technique. Think of this method as adding furniture to your home to make it yours. Post-processing is not just a technical function but rather a blend of technical and creative skills required to create the final image. When editing an image I consider it a performance that combines my previsualization, editing skills, and passion for my art into that very moment in time. Future edits of the same file might vary, not just because of my improving skills, but also changes in my focus and emotions.

In this part, I illustrate how I work on a scene to tell my intended story. Each location is different and affects the way I feel. Similarly, each person I meet during my global travels has their own story and is always part of my thought process when editing their portraits or images of their home country. I consider all this, plus the technical aspects of the process when editing. It is important to consider all of these factors before making any actual edits. I describe my method for making some edits globally and leaving others for a masked region where you can control the color and density to help lead your viewer's eyes through the scene.

Adobe Lightroom Classic is the tool I use most often and is the focus of what I want to show you in this book. While I still use Photoshop and have invested 10,000 hours in it over the last 20 years, I am quite pleased with the improvements in Lightroom and find that I can complete most of my editing without Photoshop. Masking is the main reason I focused on Photoshop for so many years as it allows me to create more intricate masks and gives me the opportunity to combine multiple images together manually, something Lightroom is incapable of doing without the aid of automatic HDR or Merging. Lightroom tools have progressed significantly, allowing me to feel confident in showing you all that can be done with them.

Before we get into my processing method, we need to discuss contrast. Lightroom offers several tools to change the contrast of an image, each having dramatically different results. You may be using some of them already without realizing you are adjusting contrast.

When you change the contrast of an image, you alter the luminance of all affected pixels. And any tool used to increase or decrease the density of a pixel changes the contrast. Some tools apply contrast globally, while others use masks to affect only a specific region.

The effect of adjusting the contrast of an image is essential when working with RAW image files. RAW image data is designed to look flat and lacks contrast. This gives you, the photographer, the opportunity to apply the contrast to your preference, rather than the camera doing it for you. Editing in Lightroom uses an RGB color space that allows the editor to manipulate contrast and color simultaneously. This means that when you change the luminosity of pixels, you also change the color. After making dramatic contrast changes, you will notice changes in the saturation. Typically, as you add contrast, you also increase saturation. Each tool we're going to discuss has a unique way of adjusting contrast, with some having a greater impact on color than others. The trick to applying contrast adjustments is to apply them region by region; do not apply them globally. If you sharpen your file in Lightroom, use the Masking slider within the Details Panel, as I explain below.

Sharpening

It is important to understand that sharpening tools adjust contrast to change the apparent sharpness of an image, even though it is not normally considered contrast to be a contrast tool. The top two sliders in the Detail Panel under Sharpening are Amount and Radius—these sliders are by far the most critical. The Amount slider allows you to increase or decrease the contrast ratio along the edges of all detail. The Radius slider allows you to increase or decrease the number of pixels affected by the Amount slider—when you increase Radius, the area affected is larger. If you increase the radius too much and the viewing distance to your final image is too close, a halo becomes visible. If viewed from a greater distance, the halo appears as a sharper edge. These sliders work on what is called a Kernel, which is a special type of mask which determines what is an edge (and therefore should be sharpened) within the image.

Because sharpening tools should not be applied globally, Lightroom offers a slider within the Detail Module called Masking, which alleviates potential problems caused by global sharpening. This slider creates a mask of all the regions within your image that hold very little detail and are outside of the kernel. When you increase the value of this slider, more and more of the image is masked away, allowing only specific regions to be affected by your sharpening settings, or what is within the actual kernel of data around all the edges of your image. If you hold the option key (Mac), or alt key (PC) while dragging this slider to the right, Lightroom reveals the masked areas in black, leaving the region in white that will be sharpened. Slide this right until the regions like a sky go black. I rarely go past 50, as this will create a visible edge to the mask or kernel.

Texture

This tool is used to adjust the amount of contrast in detail similar to edges but larger in size. A sharpening kernel of data might hold edges with 1–5 pixels. Texture affects edges that are even larger, such as all the limbs of a tree. This tool can also reveal halos when overused.

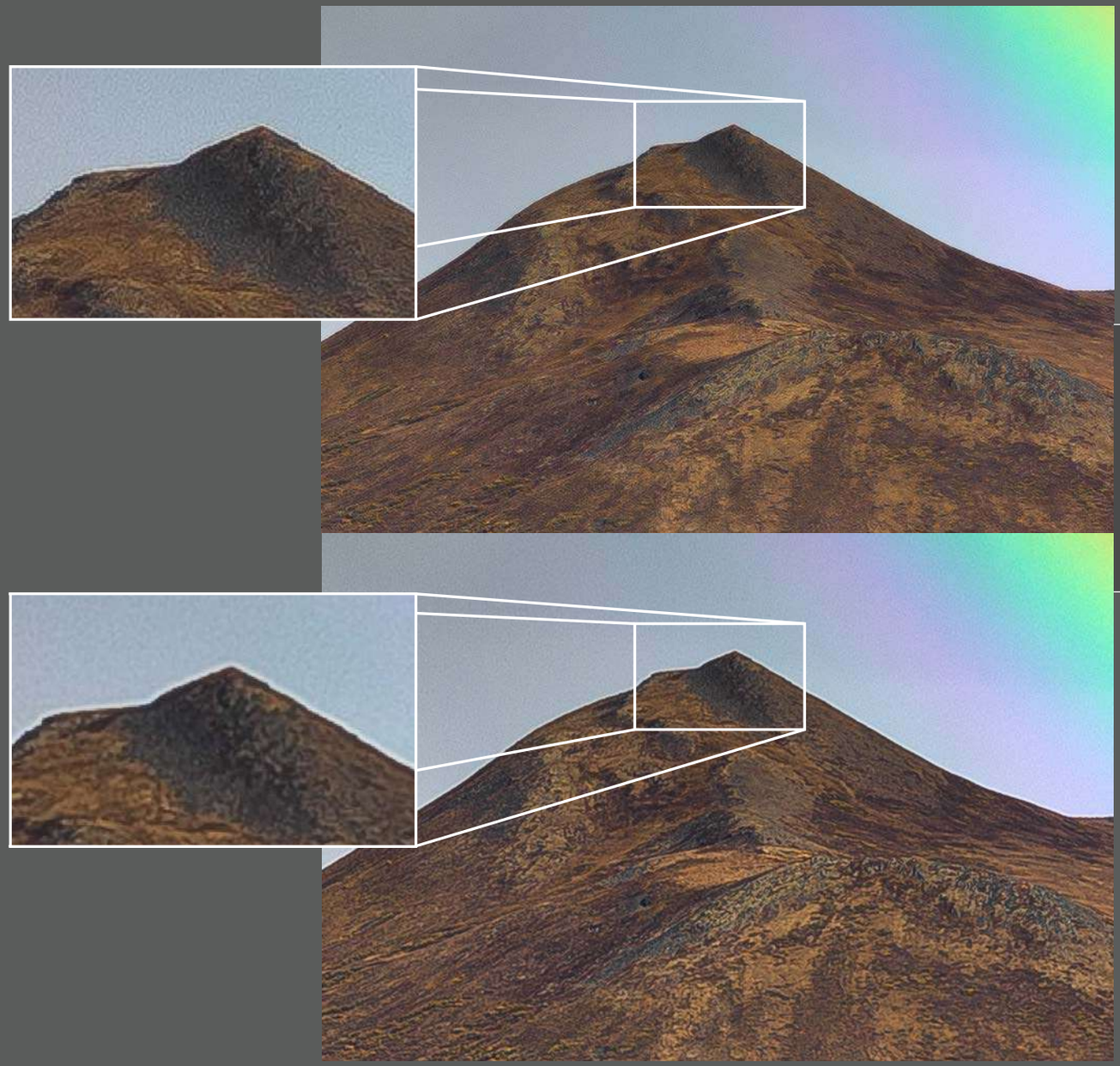
Clarity

This is used to adjust the amount of contrast in subjects closer to midtones. It is often used to add more contrast to cloudy skies. This tool rarely creates halos, but if used to extremes, it does reveal digital noise.

Contrast

The Contrast slider affects regions that are large in size; it is typically used when affecting the entire image or making global adjustments. This tool controls much larger regions of darks and lights, making everything that is brighter than a midtone even brighter, and everything that is darker than a midtone darker. There are several other ways to adjust and refine contrast in an entire image, including the Tone Curve, Highlight, Shadow, Blacks, and Whites sliders. The Contrast slider is a basic tool that I rarely use because it does not offer the control I prefer.

One other tool—Dehaze—affects contrast but is so different from the other tools that I left it out of our discussion on contrast. Dehaze is a combination of contrast and color saturation. Yes, it's true that when you increase contrast, color becomes more saturated, but Dehaze also increases the density of the color as well as the saturation. Increasing Dehaze adds contrast and darkens colors, like using a polarizing filter on your lens.



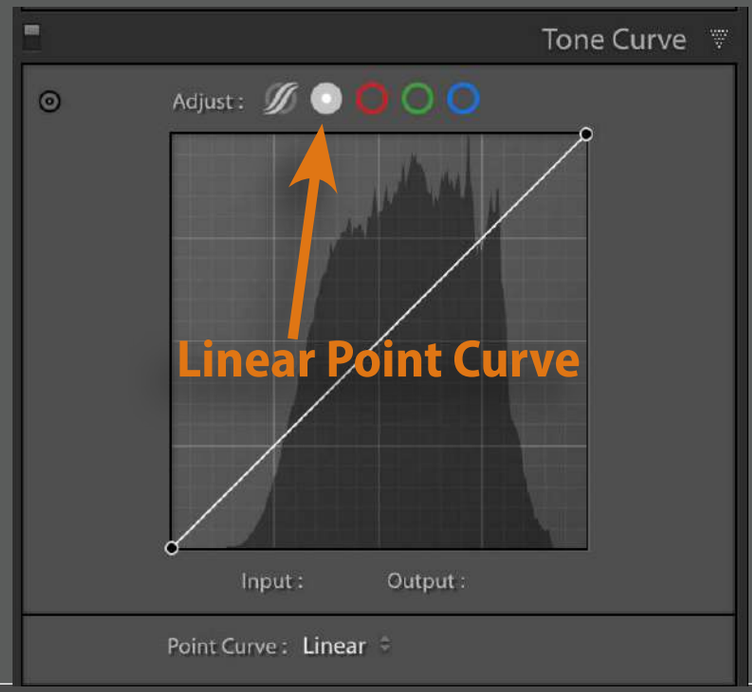
The top image shows what the 2:1 detail of an image looks like with the Amount set to the maximum of 150. The bottom image shows what happens when the Radius is increased to its maximum of 3 pixels. Notice the halo around the horizon.

The Infamous Tone Curve

Using the Tone Curve takes practice and is less intuitive than a simple slider, so many new users avoid it. I learned how to adjust contrast with a tone curve and still believe it is a very powerful tool and thankfully it is now available in Lightroom and not just Photoshop. The Tone Curve is a global editing tool and can be compared to the Basic Panel luminosity sliders. There are a few differences between the Tone Curve in Lightroom compared to Photoshop, but the basic function is the same. It gives you complete freedom to adjust all the contrast in any image.

You can add points to the curve at any given density between black and white, then adjust that point by dragging it up to make it brighter or down to make it darker. This is all done on the RAW data on a linear scale. The Targeted Adjustment Tool (TAT) can be used to reveal where the density in your image is on the Tone Curve, and then edited accordingly. In the upper left corner of the Tone Curve module, look for the small circle and click it once to activate it. Now scroll over your image and you'll notice the appropriately linked dot appearing on the Tone Curve in the exact location of the density that density is linked to in your tool.

One of the reasons I prefer to use the Tone Curve for larger, more invasive edits is that the tool is not adaptive based on your image data, but rather independent, and capable of moving the data the same on any image file. When you use the sliders in the Basic Panel such as Shadows, Highlights, Blacks, and Whites, it is possible to adjust them too far and create halos between areas of greater contrast. While you also can adjust the Tone Curve too far, it does not create those same halos because it does not create masks when applying the adjustment to the image. The Basic Panel sliders are adaptive to your RAW image data and vary based on those values. Using the Basic Panel sliders may look better on certain images, but there are plenty of times when it is not the superior method to set the contrast range, adjust the midtones, or to add contrast. Without the masking effects, the Tone Curve offers a very powerful editing solution.



The Tone Curve offers a very powerful method of setting your contrast ratio to the data in your image file—in other words, setting your bright and dark points. There are two ways to edit the Tone Curve: Parametric and Point Curve. These are both located at the top of the module next to "Adjust". The Parametric option does not allow you to set the bright and dark points so I always use the Point Curve. If you wish to set your bright point and dark point activate your Highlight and Shadow warnings located at the top of your Histogram Panel. These will warn you of just how far to adjust the whites and blacks in the Tone Curve. If you move too far the colors will appear on your image (red for whites and blue for the blacks). Make these adjustments by sliding the very top/white point, left until the red warning appears. To set the black point, slide the very lower-left corner right until the blue warning color appears. Back off, so only a tiny amount of warning color is visible. Note—Keep these points pinned to the top/whites or bottom/blacks.

This scene of Cimon della Pala in the Dolomites reveals how imperfect light can be handled with the aid of post-processing. The soft shade of the morning and the atmospheric haze were important aspects of the light in this scene that inspired me to create a final image. I used two techniques in camera to accomplish what I had in mind: focus stacking and ETTR. If done just right, I could then complete the process in post-production by increasing the brightness of the flowers in the foreground from a shadow to a midtone.

Notice the flowers are in shadow.

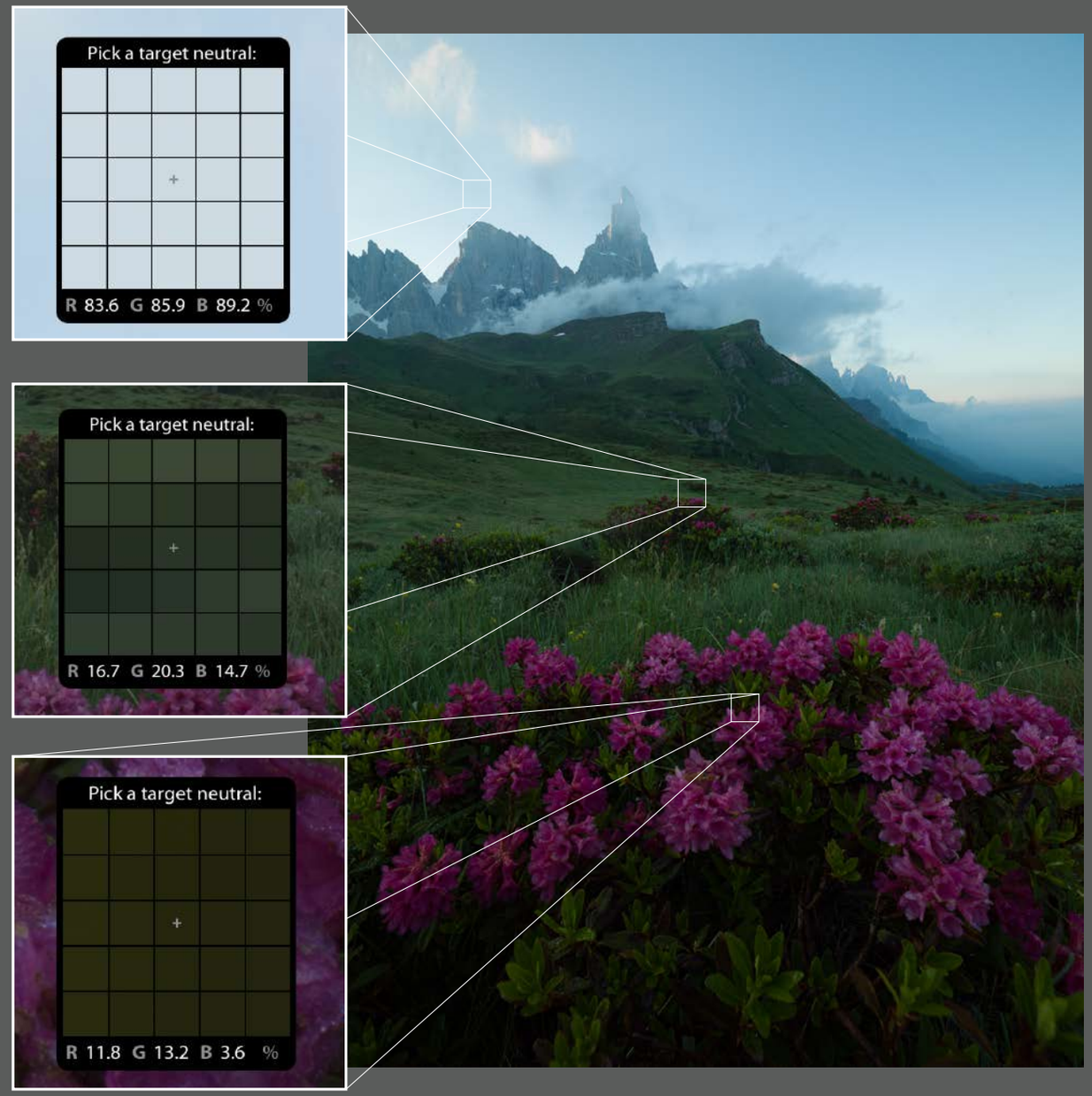
Notice the sky is a highlight.

Notice the soft, low contrast light on the meadows in the middle.

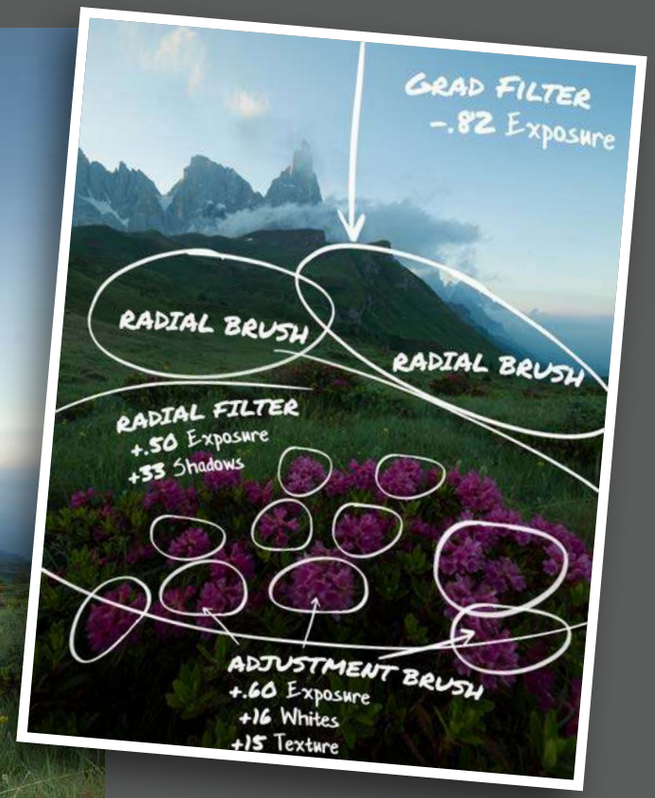
These are all aspects of the time of day and position from which the image was taken. The light in the sky is a highlight and the foreground is in shadow. Because the light was not optimal, I was inspired by my understanding, or pre-visualization, of what this scene would become.

After finding the right composition, my camera was only three feet from the beautiful flowers, so I decided to use focus stacking. When the camera is this close, stopping down would not provide enough depth of field. I then used an aperture of *ƒ*/8, allowing just enough depth of field to carry the focus deep enough to allow me to manually focus four times to capture the entire depth.

I used ETTR for the exposure, giving me the most shadow information possible for the post-production work ahead.



The exposure used for these four focus-stacked files had to be very accurate, placing the very right edge of the data at the very right of the histogram. This allowed for maximum brightness in the foreground shadows while not clipping the highlights. I used masks to bring up the shadows in the foreground to midtone values.



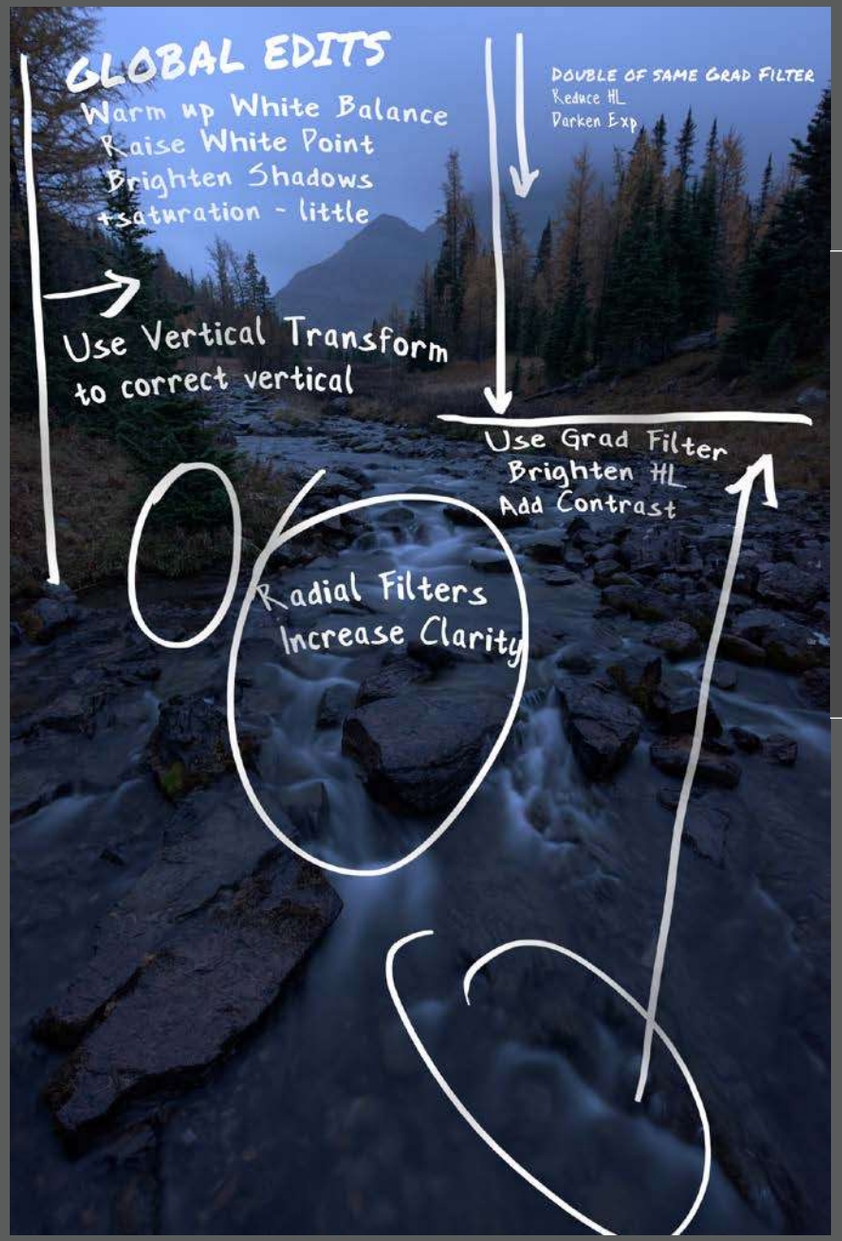
In this scene taken moments later, the sun is beginning to strike the flowers in the foreground. Because the flowers are brighter, there are no shadows to manipulate in post-processing, and the haze in the sky is bouncing even more light back down. This is a better distribution of light to be captured with one single exposure. The bright light on the foreground contains far more contrast, eliminating the soft blue cast of the early morning glow. The big difference is that the early soft blue light is luminous light after bouncing off the earth's atmosphere and back onto the flowers. The light on this second scene in full sunlight is direct light from the source. Capturing this scene in either light is a subjective choice and one that the photographer must make. Now that you know that the soft morning light is up to 4 or 5 stops darker than the sunlight, you know how to deal with it in camera and post.

Dark and Moody

Editing images can be just as exciting as photographing them. Wild weather in remote locations and memories of favorite cinematic Hollywood features have influenced the way I portray my landscape images. The lighting created for movies like "Lord of the Rings" reminds me of times I've spent in the wilderness. Hollywood is full of examples of movies that portray dark and moody scenes that can influence us in various ways. A big part of what we remember about times in our lives is the mood. Moods are created by influences we might not understand, but direct us in the portrayal of the stories we tell. In the dark of a storm that lasted for days, I remember feeling comforted not by the fury of the weather but by the subtle nuances of what was left to observe, the little things, and the stillness. Places where the quiet is loud and reveals an almost motionless and sublime world. I started looking for scenes where darkness comforted me, rather than making me nervous, and settled in over me like a warm blanket.

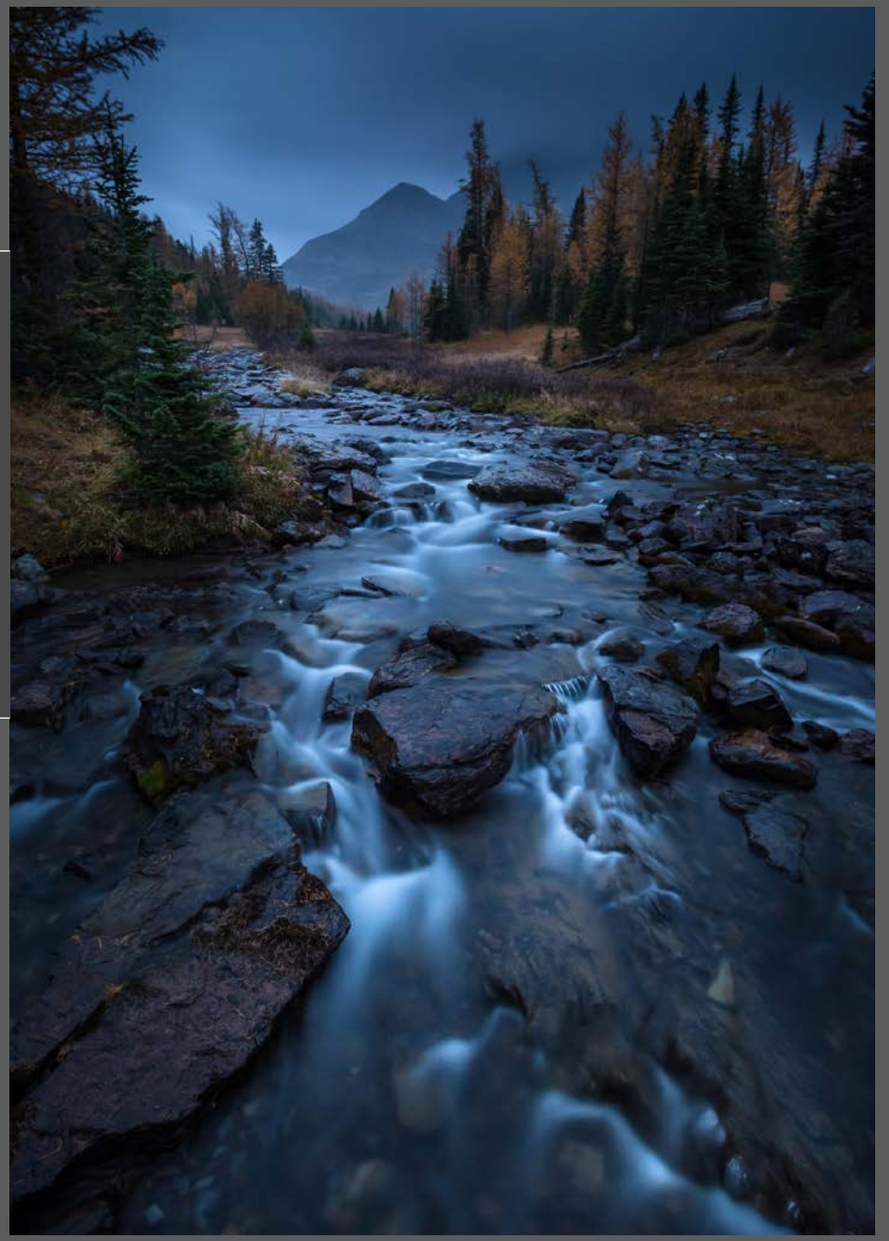
Hasselblad H5D, 90mm lens - 30 sec, ƒ/8, ISO 100

This image was captured with a 10-stop neutral density filter which extended the exposure and softened the edges of the clouds.



Nikon D810, Nikon 14-24mm lens, 30 sec, ƒ/8, ISO 1600

This image was taken before sunrise under a thick layer of clouds. I used this dark light to create a mood and a long exposure to soften the water and clouds. I used masks to lighten up the darker midtone regions in and around the brighter water, as well as lighten the forests on both sides of the stream.



Light and Bright

Bright images convey happiness and warmth, and can bring back good, positive memories. Sitcoms in television used high key lighting in most productions to convey the very same upbeat mood. It was originally used back in the film days to control contrast by simply limiting shadows to fit onto the limited dynamic range of the film. I suppose the technical requirement to lower the contrast ratio determined the light, bright look. This very same method can be used in landscape photography as a powerful tool to create the mood of a scene.

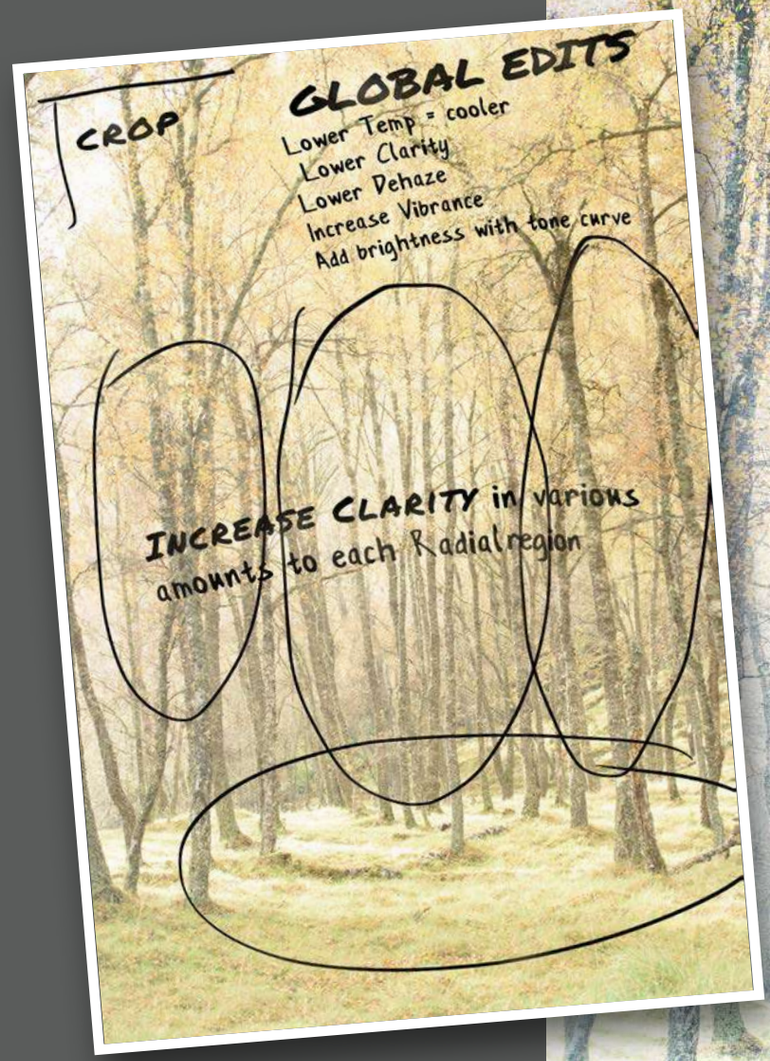
This technique works well in nature if you focus on compositions with structure. Good examples of structure include a dead tree skeleton against a bright sky, patterns of rounded boulders separated by dark shadows, and layers of ridges wandering off to the horizon. Each example is a graphic composition with bold lines. I use ETTR on many subjects during the middle of the day to accomplish this look.

Remember, a larger format camera has the dynamic range to capture the highlights as well as enough bit depth in the shadows to lighten without introducing digital noise.

Brightening an image begins with understanding what you're doing. Many of the shadows become midtones, and most of the midtones become highlights. The highlights might even get blown out or clipped. You create this look when you brighten all your luminance values by about 25%.

Nikon D800, Zeiss 15mm lens, 1/200 sec, ƒ/10, ISO 100

In an effort to reveal the softness of windswept dunes and lose any bold colors, the Tone Curve was the perfect choice for making these edits. By removing contrast and color saturation from this scene, this image reminds me of the location. It is unusual for me to remove contrast and color in any scene, but this image became more welcoming when the pastel colors were revealed.

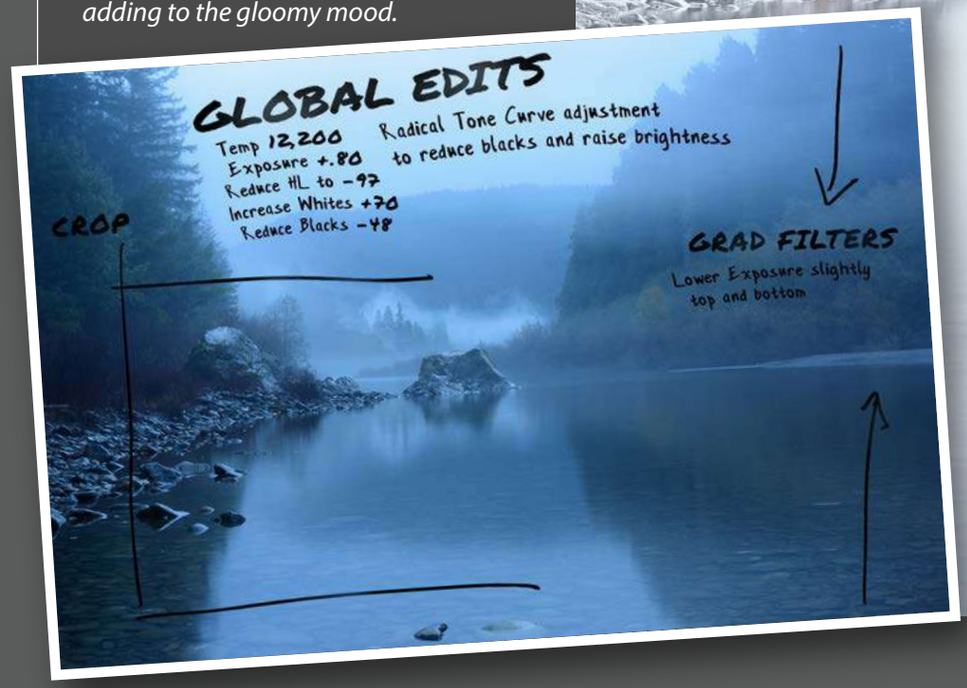


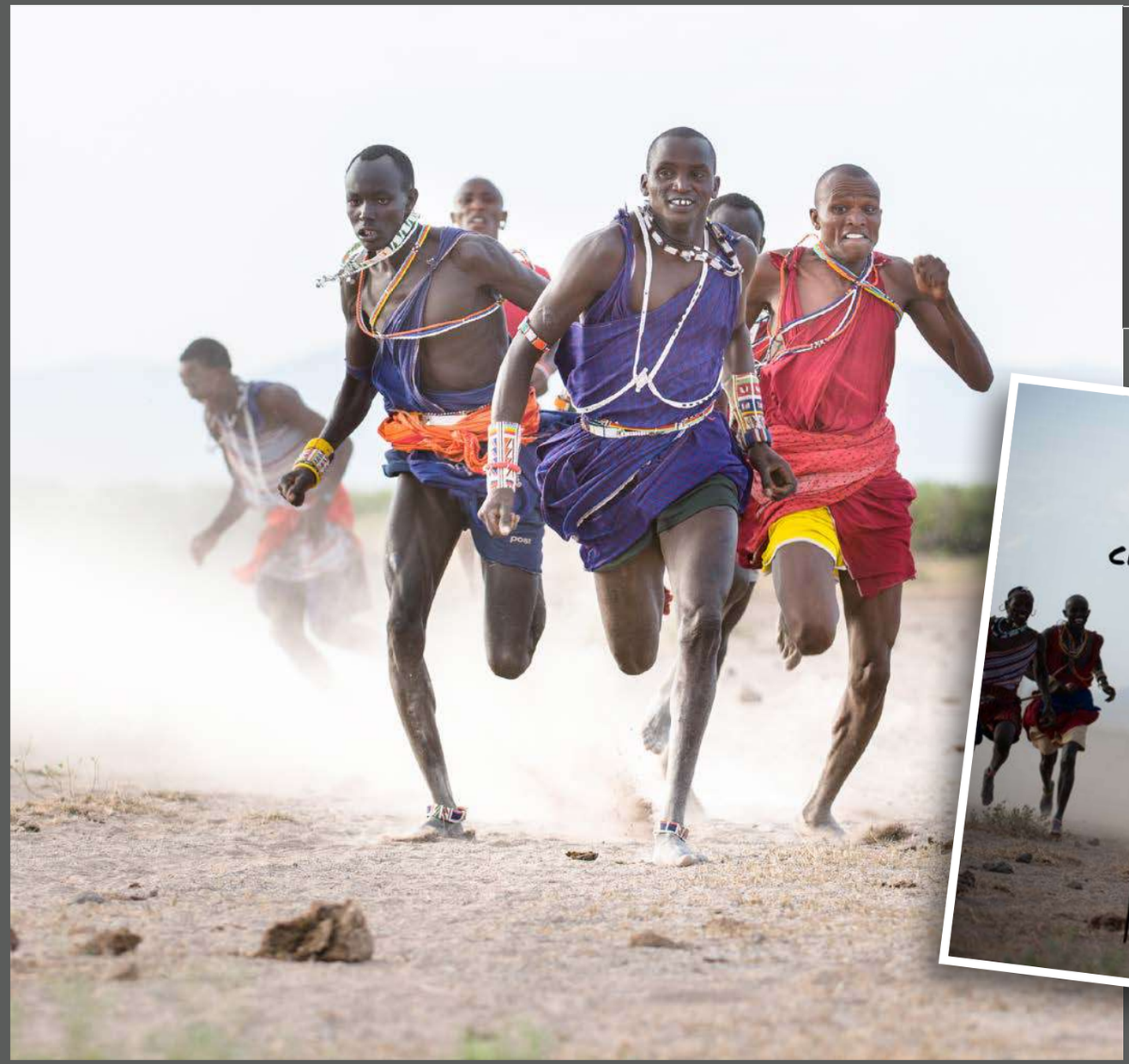
Nikon D810, 70–200mm lens, 1/6 sec, ƒ/8, ISO 200

These tree trunks offered a great structure of darks in an interesting pattern, that when made brighter still show their true form. I used the Tone Curve, sliding the bottom left point of the curve upward, to remove the blacks. This reduces the contrast significantly. I then added Clarity back into certain regions where the trunks needed additional contrast. Because Clarity does not turn any midtone black, I just added contrast to these midtones. I used Radial masks to add Clarity in some locations, to remove the yellow cast from the leaves, and to lighten up the center of the composition. This cooler color and lighter center complemented the warmer edges of the composition.

Nikon D810, Zeiss 50mm lens, 3 sec, ƒ/11, ISO 100

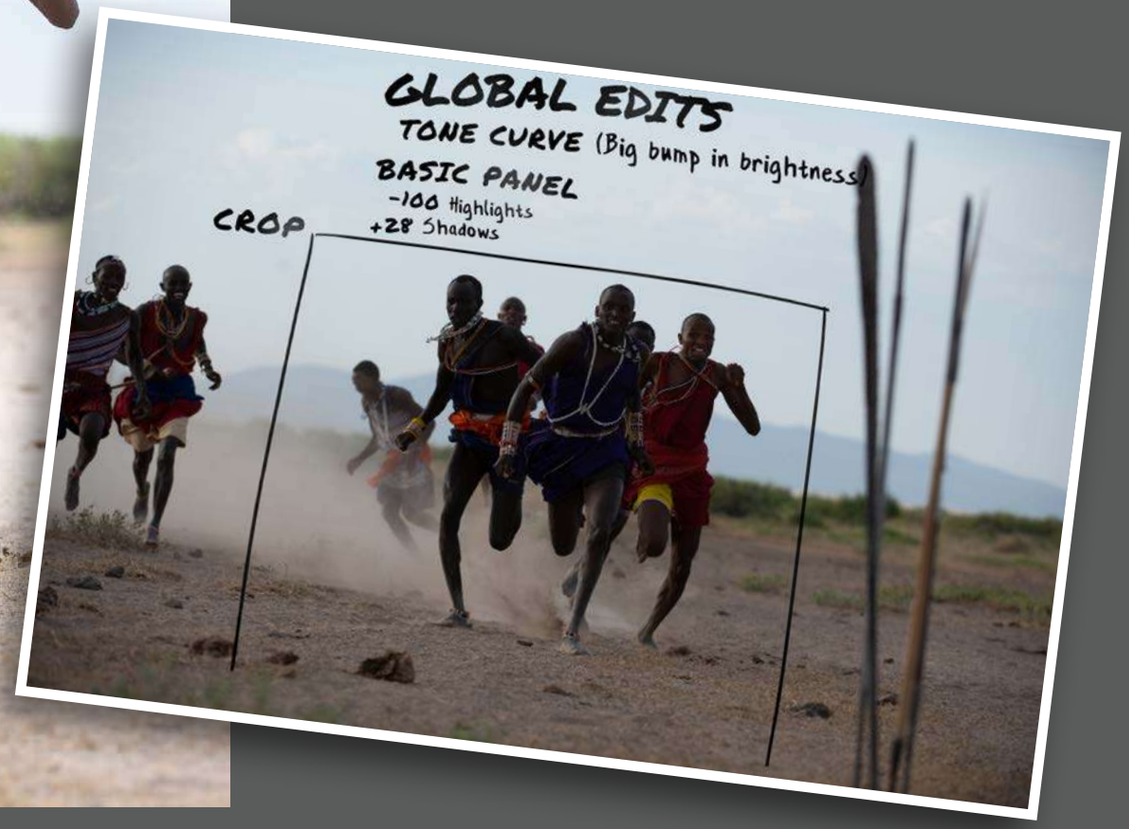
This is another scene where morning mist inspired me to lighten up the mood. It was a dark, rainy morning, everything was dripping wet, and the rocks were slippery. The color cast was blue because the sun had barely risen. The mist made this scene easy to transition into bright as I was able to color balance on the mist to eliminate the blue cast that was adding to the gloomy mood.





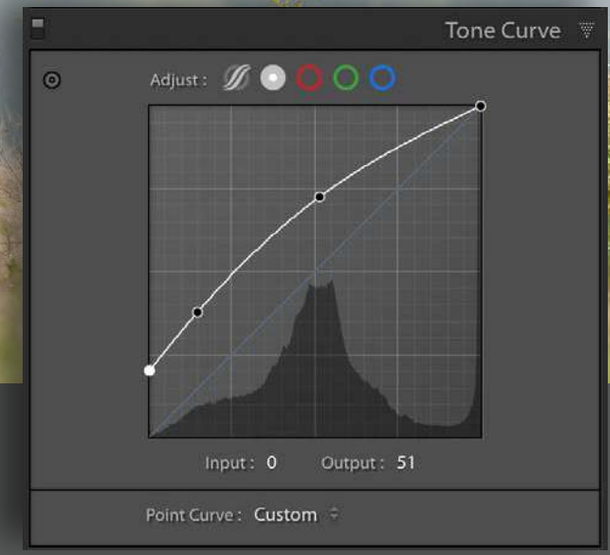
Nikon D800, 200-400mm lens, 1/640 sec, ƒ/5.6, ISO 200

Originally, I did not envision this image being light and bright, but after carefully studying the details in the flying dust and facial expressions, I changed my mind. When I brightened the faces from shadows to midtones, it revealed a nice simple white background to help focus the viewer's eyes on the runners.



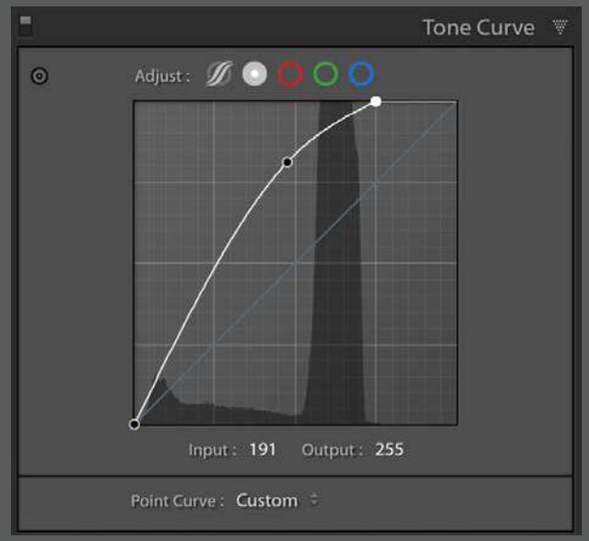
Nikon D800, 200–400mm lens, 1/3200 sec, ƒ/4, ISO 400

This scene of two greater kudu antelopes was captured in transitional light exactly when sunlight emerged from a passing cloud. The faint sun cast light on their backs and revealed the full sun on the grass in front of them. With this brighter background, like that typically created in a studio, I quickly decided to make this image light and bright. Again, the kudus are profiled against all that light, also adding to the bright effect.



Nikon D800, 200–400mm lens, 1/3200 sec, ƒ/4, ISO 400

In this scene of a lilac-breasted roller taking off, the backlight created a profile of the bird from its underside. Unfortunately, I was unable to capture the optimal exposure for this scene, but my post-processing edits brightened up the belly by adding color and contrast. My exposure was dark by about 1 ½ stops. This was caused by the bright sky above the bird that my camera adjusted for while in Aperture Priority Mode.



Painterly

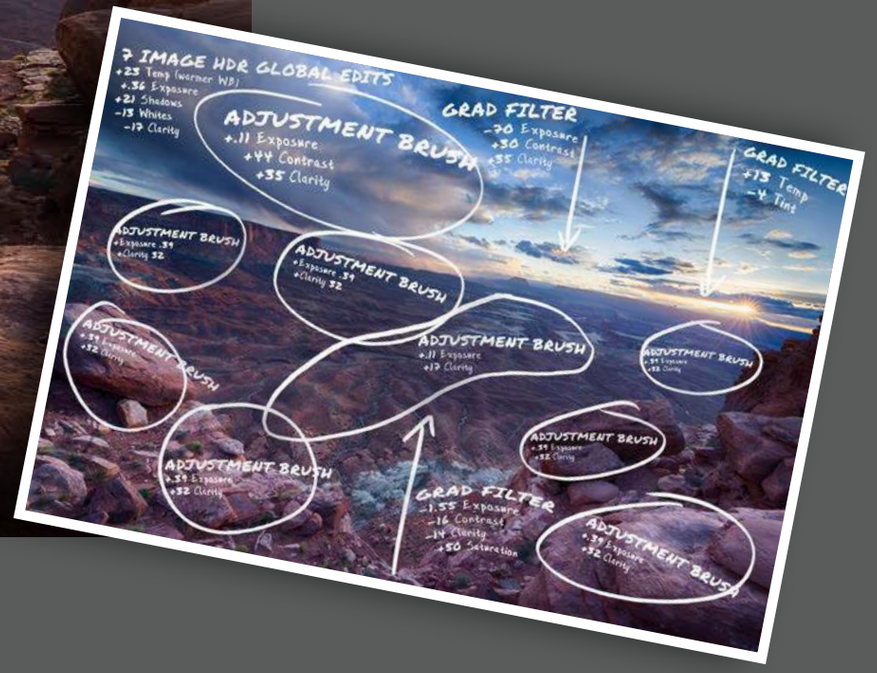
I am influenced by the romantic painters of the American West, such as **Albert Bierstadt** and **Charlie Russell**. Both of these painters created drama with spectacular light to embellish the scale of the immense grandeur of the west. The scenes included many vibrantly colored clouds, and some paintings used atmospheric haze to create depth and add scale. What made these paintings compelling was the dappled light. Often the subject would be highlighted by a shaft of light, resulting in a luminescence that was enhanced by the surrounding shadows. This luminescence is very difficult to achieve when photographing a grand scene. Being in the right location to view such magnificent landscapes with a similar light as the paintings became intriguing. Here are a few examples of the very deliberate way I process with this painterly style in mind:

Hasselblad H6D, 24mm lens, 1/60 sec, ƒ/16, ISO 64

The scattered clouds created some dappled light that cast shadows on Lake O'Hara below. These light and dark areas *inspired me to attempt a painterly approach. I knew I would need to brighten the shadows from my first exposure but with a large sensor, I had the dynamic range in the files to brighten the shadows to a midtone.*

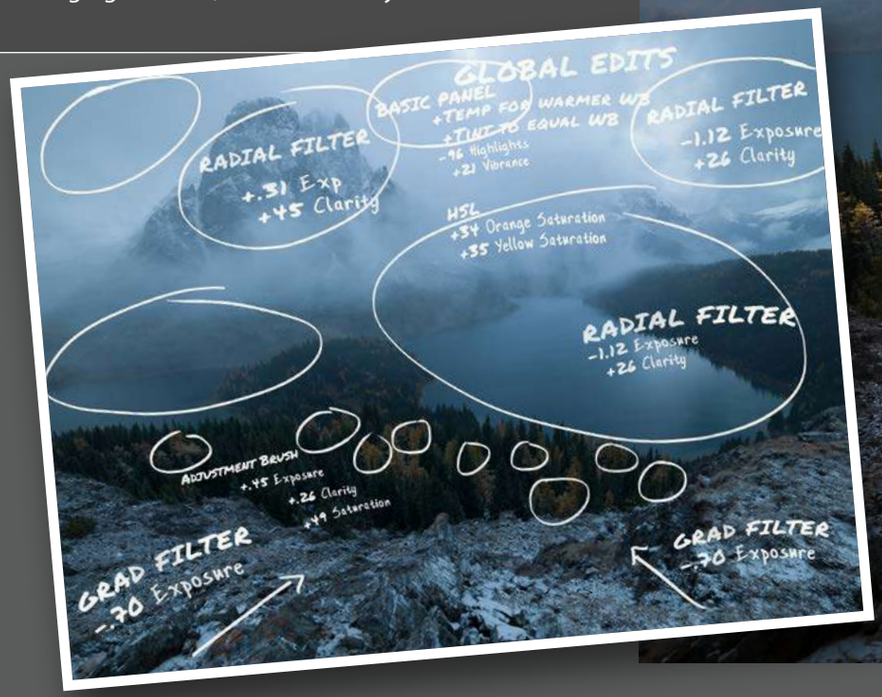
Nikon D800, 14-24mm lens, 1/60 sec, ƒ/13, ISO 200

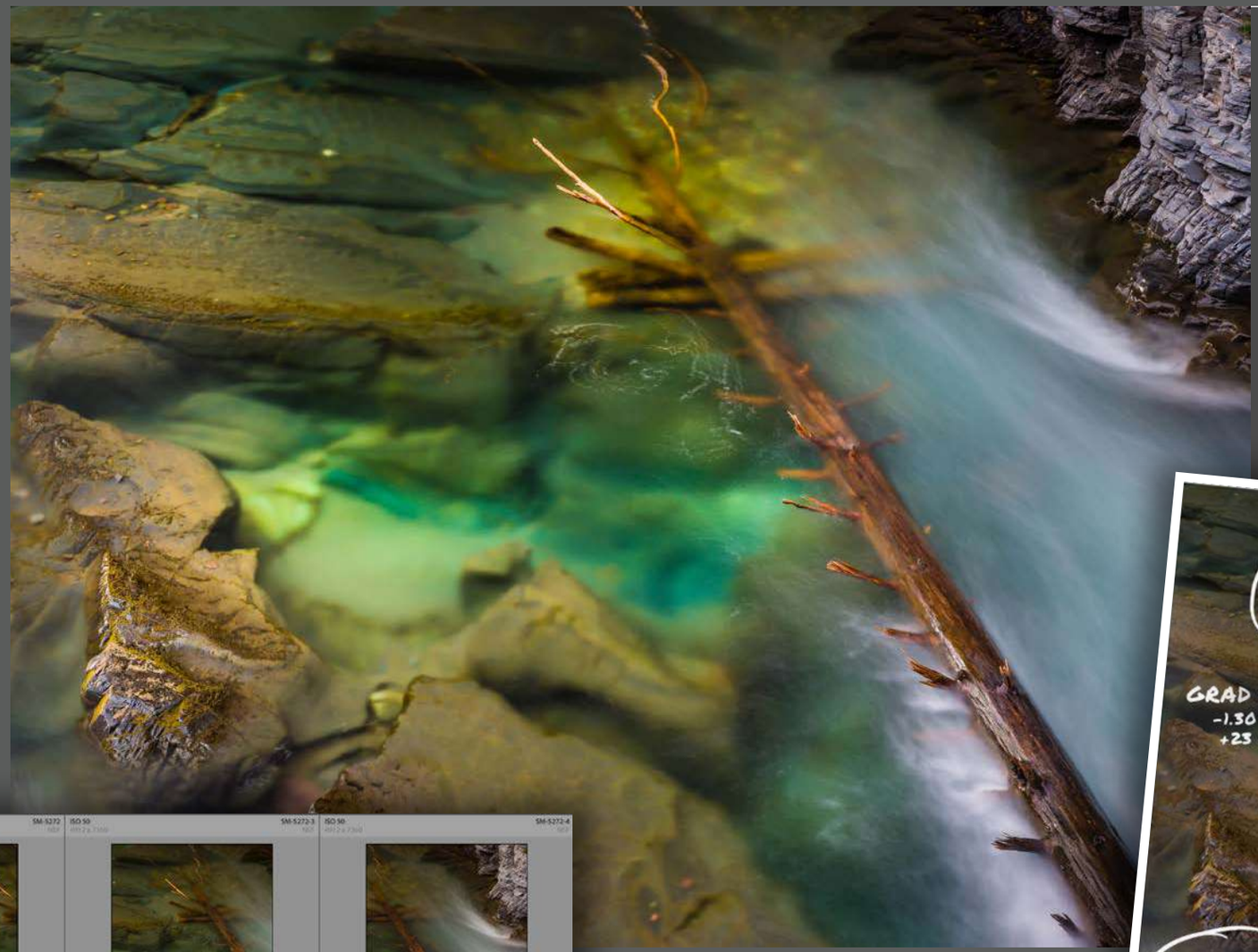
The setting sun was sandwiched between clouds on the horizon, creating natural dappled light that was warm in color. Other clouds in the sky bounced additional light into the foreground, giving more detail to the shadows. Because I was pointing the camera into the sun, I had to shoot a seven-image HDR bracket to capture enough good shadow detail in the foreground rocks.



Hasselblad H5D, 24mm lens, 3/4 sec, ƒ/8, ISO 200

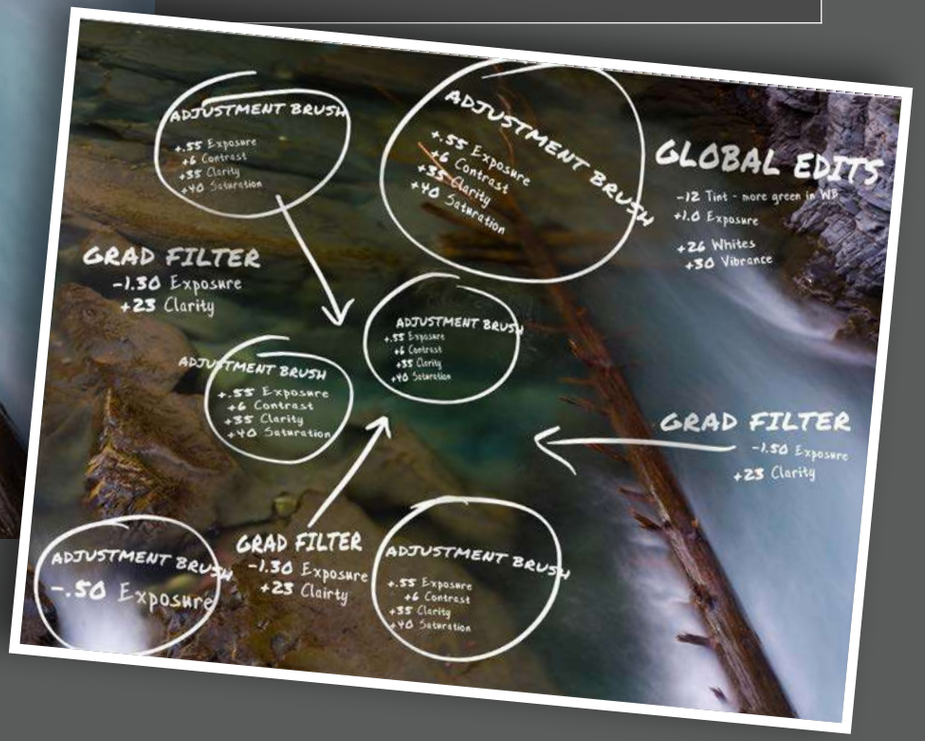
Have you ever hiked many hours only to find poor photographic conditions such as high winds or clouds blocking the view, or even both at the same time? Such conditions require patience. There are often signs of changing weather that offer some hope. On this morning I had hoped for dynamic pink clouds swirling above Mount Assiniboine. Although that image was not to be had, fast-moving breaks in the clouds revealed glimpses of another nearby mountain with a lake below. This is when I realized there was much more intrigue and mystery with the changing weather, that lasted only moments.





Nikon D800, 85mm Tilt-Shift lens, 6 sec, ƒ/19, ISO 50

This is a panoramic stitched file, created with a tilt/shift lens. I captured three files and merged them together to generate more resolution. The handy aspect of using this lens for this type of image is that the camera remains stationary while just the lens slides back and forth. By keeping the camera stationary, the image files merge perfectly. The contrast in the light was soft and even, but in this scene, I added additional highlights with a big soft brush to create a more intriguing mood.



Textured

I've always been inspired by the amount of detail in nature. The shapes of geologic rocks, ancient icebergs, and 3,000-year-old trees all have so much to study. Much of this small detail forces me to capture it with as much resolution as possible. Over the years, I've used many different types of cameras to capture high-resolution images. I've stitched multiple files from full-frame sensors, as well as from high-resolution medium format sensors. Capturing this much detail is fun to look at and post-process, but it is not the only way to highlight and display nature's details. This section of edits will use all the great tools Lightroom has created: Sharpness, Texture, Clarity, and Contrast.

Hasselblad H5D, 28mm lens, 1/350 sec, ƒ/8, ISO 100

Icebergs are a good example of a multi-surfaced subject that requires different tools for different sides. The sky behind the ice needs contrast, requiring a mask. The sunny side of the iceberg requires Texture and the shaded side requires Clarity. I preferred Clarity on the shaded side because of the lack of fine detail and smooth surfaces. I made a separate mask for the sky and used Contrast and a bit of Clarity.

Hasselblad H5D, 35–90mm lens, 1/800 sec, ƒ/11, ISO 100

The backcountry in the interior of the southern island of New Zealand is full of poplar trees, ridges, and rocks—all requiring various types of contrast and texture. With a bright sky backlighting this scene, I had to use a faster shutter speed to capture all its detail but also maintain some shadow detail in the landscape below. Before I captured it, I knew I would be masking the foreground to make it brighter in regions. I ended up adding a combination of Clarity and Exposure to much of the grassy hills. I then added a mask to the road and used the Texture slider, adding what I believe was more grit.

Desaturation

While traveling to remote parts of the world, I'm moved by the faces I see—they are filled with character that tells of their experiences and untold stories. I only wish I could afford the time to hear them all. The faces of these people have left an impression on me, not just of the place where they live, but of the culture, hardships, and happiness they've experienced. By removing most of the color from these portraits, I maintain the features and just enough color to reveal a bit of our modern times.

Hasselblad H5D, 100mm lens, 1/180 sec, ƒ/6.8, ISO 100

This portrait was captured on a sunny morning under the shade of a tarp. Notice I've used the "light and bright" technique here. The only soft light available was the open shade. I made the exposure fast enough to capture some detail in the highlights behind her and maintain just enough detail in her shadowed face. I double-checked my histogram to be sure I did not clip the highlights. Because I was using a medium format camera, I felt confident that I would have plenty of detail in the shadows *to reveal all the character and tonality of her face. This young girl's hair is braided in a traditional manner to reveal that she is not married.*

Nikon Z7, Nikon 70-200mm, 1/250 sec, ƒ/5.6, ISO 250

I had no lighting equipment in the middle of this sunny hot afternoon. I did not have the time to create open shade, as the woman was in this position only momentarily. I chose to capture her in the softest light possible, facing away from the bright light. As I captured this image I realized she was feeding the placenta of a baby Llama to some puppies that she was raising. A sign that nothing was spared in her hometown, which was situated along the shores of the salt flats of Bolivia, at 12,000 feet in elevation.

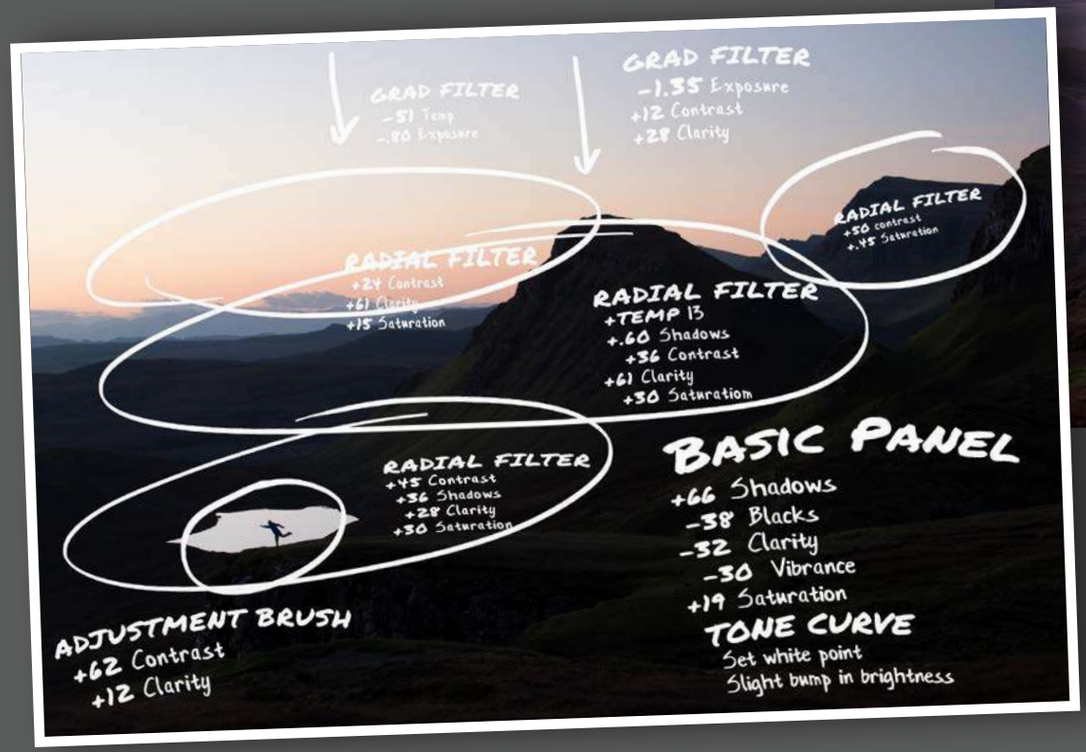
Hasselblad H6D, 50mm lens, 1/2000 sec, f/5.6, ISO 400

I typically would not capture a portrait in full sun, but in Mongolia where the eagle hunters live, I figured the light should match the location. It was a rugged land much like the state of Nevada, full of arid vegetation, sand, and expansive views. In addition, the full sun cast harder shadows that exaggerated the textures in the man's elaborate clothing. The detail of his outfit needed more light to reveal its texture, and this was late afternoon, giving a slight warmth to the colors. I later processed this image with what I like to refer to as "speedy HDR". Slide the Highlights slider to the left and that Shadows slider to the right, thus revealing more detail in both regions. When you decrease the contrast, you lose color. I also reduced the Vibrance slider to further desaturate the colors.

Radical Edits

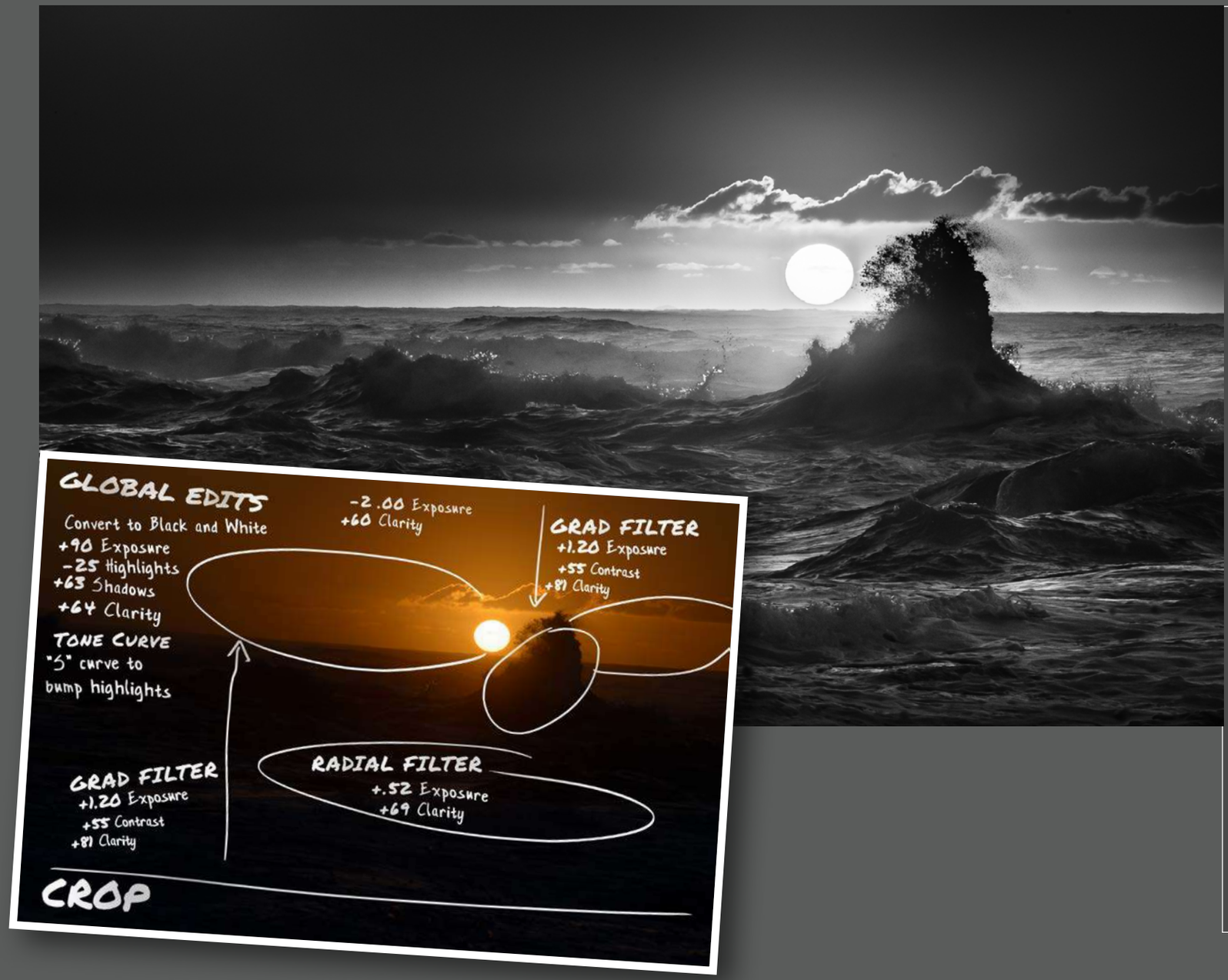
Out of the shadows!

The light that is hidden in the shadows can be amazing. Our eyes do not see everything and if we don't squint or specifically look at the light in the dark areas of a scene, we might miss it. As I mentioned in my introduction, light changes quickly, subjects can be moving, and sometimes you only have a split second to capture an image. The two images in this section are examples of just that, a quickly captured scene with no time for fancy camera techniques. For these scenes, I practiced ETTR and hoped that I had enough information in the shadows to allow me to edit to my heart's content.



Nikon D810, 70-200mm lens, 1/3 sec, ƒ/8, ISO 560

This image was made with a single file and multiple masks in Lightroom. At this time masking in Lightroom was new and I was testing its capabilities. I exposed this scene for the highlights so I would have enough detail in the cloudless sky to capture the morning colors. The shadows were less important for the success of the image because I would become a silhouette.



Nikon D800, Nikon 70-200mm lens, 1/500 sec, ƒ/16, ISO 200

As you've probably noticed, I've shown only a few black and white images in this book. While I love working in monochrome, I believe that color is more challenging when working on luminosity. When you no longer need to consider color during post-processing, it's a simpler process because color limits each edit by adding the issue of color bit depth. Once you understand how to process color images, the transition to editing black and white is more straightforward. I was confident that I would convert this image to black and white when I captured it. Why? Because I was inspired by Japanese block carvings. When you study these works of art, you notice strong shapes created by unusual subject forms. The outlines become the compelling subject, which is exactly what these crazy splashing waves were creating. I chose to convert this to black and white to focus the viewer's eye on the graphic shapes of the water and sun. The bright sky behind the waves helped delineate the wave profiles to create the necessary contrast. Because it was sunset and the sun was on a hazy horizon, there was much less contrast than during the brighter times of the day. There was very little detail in the shadows but as you can see here, I used many masks to reveal enough detail to give the water texture.

Conclusion

It takes time and dedication to improve the quality of your art. This book was created with all the love and enthusiasm I have for photography in the hopes of sharing valuable information I've learned along the way. Understanding light and the impact it has on an image significantly improves the quality of your photography. By observing the characteristics of light, you become experienced in deciding how to visualize light and how it contributes to your art. When you create an image in this light that you've pre-visualized, it becomes unforgettable. As you put this information into practice, I hope you feel more prepared to capture those fleeting moments.

Over the past few months, the world has shut down because of a pandemic, giving me the time to complete this book. I became laser-focused on sharing my knowledge on some of the science behind the art of photography. During this time at home, I also realized how much I miss observing "light." I found myself looking out my window with an intense yearning to practice what I was writing.

High in the Santa Ynez Mountains near my home is a rock feature that I've always wanted to explore. It is surrounded by a natural barrier of chaparral that covers our Mediterranean geography. Many years ago, I had attempted to climb the rock with ropes, but the density of the chaparral was too much to overcome. During the past few years, a narrow steep trail was constructed to reach the rock. With extra time and social distancing rules keeping me from seeing other people, I decided to explore the local mountains and that trail. If all went well, I would find myself at the base of this feature in a large cave, looking out over the Pacific Ocean. What I had pre-visualized was a scene captured within the cave. At the same time, a layer of low fog covered Santa Barbara's city lights below, giving enough darkness during a new moon to see the Milky Way over the Pacific. If I timed it right, I could make this shot happen. I've observed the fog roll in over Santa Barbara throughout my life, especially in the spring. If it happened during a moonless night, then what I was pre-visualizing would occur.

I watched and waited for the best time over many weeks. Then, after observing a fog bank arrive consistently night after night, I realized it was time. I arrived at the rock just as the sun set and the fog bank was caressing the shore. The moon was setting by 11:00 PM. I scrambled down the cliff to the cave I had remembered. In the following hours of darkness and supreme beauty, time flew quickly. I created panoramic compositions over and over, observing the quality of light. Finally, one of my pre-visualized images occurred—the Milky Way arrived from the far eastern edge of the cave window. I had a couple of small light panels to bounce illuminant light off the walls behind me in hopes of creating a soft glow on the arch of the cave's entrance. I rested the lights on a small ledge just a few feet behind me and pointed them in the opposite direction. It's moments like this when you realize that all the practice to understand light and how it affects your camera and digital file, and how it will appear in print on a wall finally pays off!

This book was created by a team. I want to thank David Rosenthal for helping me mold my lessons into the appropriate order to be clear, and laying it out graphically to make more sense. I want to thank Lisa LaPointe for continually questioning my writing until I shared what's in my head. And I want to thank many of you who helped me along the way with some very helpful tips.

Following Page:

Fujinon GFX 100 camera, LAOWA 17mm lens, 20 sec, ƒ/4, ISO 5000

This is a panoramic scene created by focus stacking four images. One image captured with the focus on the stars and the other on the cave. During the exposure for the cave, I used a small light panel for illumination. The four images were stacked manually before merging the entire scene.

Glossary of Terms

aperture. A variable space through which light enters a camera. The term aperture is also shorthand for the size of the space. For example, we may refer to a "wide/large" aperture of ƒ/2.8 or a "narrow/small" aperture of ƒ/16. Also, see ***ƒ-stop***.

backlight. Illumination from behind an object.

bounce light. See ***fill light***.

bracketing. Taking a series of images with varying exposures, for one of two purposes: to obtain the optimal exposure, or to be combined into an HDR image. Also, see HDR.

clipping. This occurs when the range of tonal values in an exposure exceeds the camera's ability to record it.

color cast. A uniform color bias to an image, or area of an image.

contrast ratio. The ratio between the brightest and darkest tones in a scene.

density. A measure of the "blackness," or light absorbance, in a region of an image.

depth of field. The zone of acceptable sharpness in an image. Depth of field is generally controlled by three factors: focal length of the lens, aperture (ƒ-stop), and distance from subject to the camera.

direct light. The light falling on an object from a single primary light source

DNG. A file format developed by Adobe for the storage of digital images generated from multiple proprietary (camera manufacturer) RAW image file formats.

dynamic range. The ratio between the darkest and lightest tones a camera is capable of recording.

exposure. The total amount of light allowed to reach the camera's electronic sensor or film. Exposure is generally controlled by changing shutter speed, aperture, and ISO.

fill light. A form of supplementary light used to lessen the amount of shadow created by a primary light.

focal length. The distance between the optical center of the lens and the camera's sensor (in mm), when the camera focus is set to infinity. The longer the focal length, the narrower the angle of view as seen through the lens.

focus stacking. Creating multiple images w to create a new image with a greater depth of field.

ƒ-stop. A measure used to express the size of a lens aperture, defined as ƒ = focal length/aperture diameter. The smaller the ƒ-stop number, the larger the size of the aperture.

grayscale. A chart containing a series of (typically 56) graduated intensities from pure black to pure white.

hard light. Light which creates distinct, sharp-edged shadows.

HDR. Acronym for ***High Dynamic Range***. A photography technique that uses bracketing and post-processing to create an image with a greater dynamic range than could otherwise be captured in a single image.

highlight. The portion of an image that falls between the midtones and whites, with a density between 70% and 95% on a grayscale.

histogram. A graphical representation of the various tones contained in an image.

illuminant. A source of light, or the quality of giving off light.

illuminate. To light up.

illuminance. The amount of light per unit area.

incident light. Light (direct or indirect) that is falling on the subject.

indirect light. Light which comes from all sides, ambient light.

JPEG. A form of digital image format that contains a degree of lossy compression.

light meter. A device used to measure the amount of emitted or reflected light.

lumen. A unit of measurement for the brightness of light.

luminance. A measure of the amount of light that is emitted from a source or reflected from an object.

luminosity. The perceived brightness of a light source by a human observer.

luminous. Full of or giving off light.

masking. A process used in digital image processing software to select some portion(s) of an image for the purpose of making alterations to that portion.

monochrome. An image style that uses varied tones rather than colors. Black and white. photography uses a range of gray tones, and so is considered monochrome.

neutral color. Produced when all of the colors in a color profile are present of equal values. Generally used to describe black, white, and various tones of gray on the grayscale.

picture style, picture control, picture profile, etc. A set of terms used by different camera manufacturers to all describe a given set of parameters that can be applied to an image in order to create a specific effect. Picture styles are applied in the creation of JPEGs, and cannot be undone.

pixel. a tiny area of illumination on a display screen, one of many from which an image is composed.

post-process. To alter an image after capture. Post-processing is generally done to bring the image closer to what was originally envisioned, or to add artistic interpretation.

RAW. A form of digital image format that is unprocessed. RAW files allow the photographer to make adjustments to exposure, saturation, white balance, etc. after capture in a lossless fashion.

reflective. Providing a reflection or capable of reflecting light.

reflective light. Light that has been reflected from one surface onto another.

RGB. Acronym for Red, Green, Blue. In our camera, and in an RGB profile, all colors are a derivative of red, green, and blue mixed in varying amounts and tonal intensities.

saturation. The intensity of a color.

sensitivity. A measure of a camera's (via digital sensor or film) ability to capture light. A sensor with greater sensitivity would have a greater ability to capture low light.

sensor. The portion of a digital camera that converts photons of light into an electronic signal.

shadow. **1.** A dark area produced when an object comes between a light source and a surface, or the same area as represented in an image, or **2.** the portion of an image that falls between the midtones and blacks, with a density between 5% and 30% on a grayscale.

sidelight. Illumination from the side of an object from the viewer's point of view.

soft light. Light that creates diffuse, soft-edged shadows.

specular highlight. An intense, bright spot that occurs when light is outside of the dynamic range. Specular highlights will generally appear detail-less white in an image, and should not be taken into account when considering clipping.

stop. A relative change to exposure, as controlled by the combination of aperture, shutter speed, and ISO. To change an exposure by one stop is to double or halve the amount of light reaching a camera's sensor or film.

tone. The darkness or lightness of a particular region in an image separated by density numbers.

white balance. A camera setting or develop setting used to compensate for a color cast.

MUENCH WORKSHOPS

The Art of Luminosity by Marc Muench

Copy Editing: Lisa LaPointe and David Rosenthal

Design: David Rosenthal

Want to share this book with friends? Please do not share this PDF file, but ask them to visit **muenchworkshops.com/ebook** and we'll send it to them. Thanks!

Published by Muench Workshops LLC, 2020.
All photographs and text are copyright of their respective photographers and authors.

All rights reserved. No part of this publication may be reproduced or transmitted
in any form or by any means without written permission of the publisher.