THE ULTIMATE GUIDE TO LONG EXPOSURE PHOTOGRAPHY

A CaptureLandscapes eBook written by Christian Hoiberg

Published by Christian Hoiberg
www.capturelandscapes.com / chris@capturelandscapes.com

CONTENTS

CHAPTER 1

Introduction

Introduction

Have you seen an image of a waterfall where the water has a soft and silky, almost unreal, feel to it? Perhaps you've seen an image from within a city where cars lights are turned into long red lines? Many tend to believe that these types of images are heavily manipulated in various softwares but they're not. The truth is that it's a rather easy technique using a slow shutter speed for a longer exposure time.

This eBook will teach you everything you need to know to capture beautiful images using the technique referred to as Long Exposure Photography.

It's split into 6 parts; we start by looking at the required and recommended equipment before moving on to the basics of long exposure photography and fundamental knowledge of your camera, followed by the technical aspects of Long Exposure Photography and, finally, how to capture these images yourself.

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 50 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 90 sec

What is Long Exposure Photography?

Long Exposure Photography is a technique that has become very popular among landscape photographers. This technique uses a slow shutter speed to capture, blur or obscure moving elements. Water takes on a magical silk- or fog-like appearance and clouds will streak across the sky.

It's not only landscape photographers who've grown to love the technique. In fact, it's also popular among other genres of photography such as cityscapes, street photography, abstract and culture. Even though it's more common within certain areas of photography, it's a style that can be used by many; it's only a matter of finding a creative way to use it in *your* photographic style.

Examples of when you can use Long Exposure Photography:

- Urban photography
- Abstract Photography
- Creative Portraits
- Lightpainting
- Startrails
- Cityscapes
- Street photography

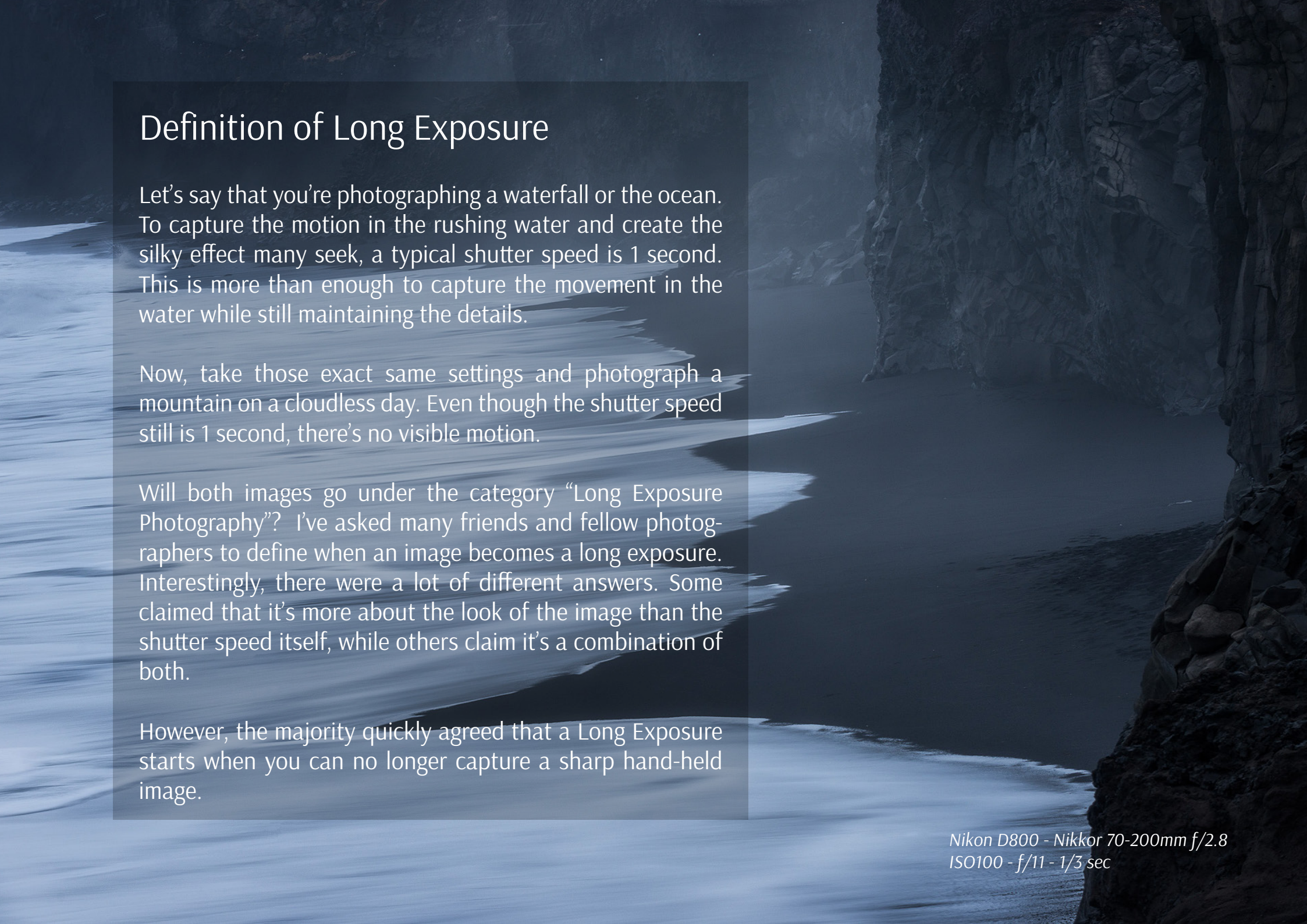
Definition of Long Exposure

Let's say that you're photographing a waterfall or the ocean. To capture the motion in the rushing water and create the silky effect many seek, a typical shutter speed is 1 second. This is more than enough to capture the movement in the water while still maintaining the details.

Now, take those exact same settings and photograph a mountain on a cloudless day. Even though the shutter speed still is 1 second, there's no visible motion.

Will both images go under the category "Long Exposure Photography"? I've asked many friends and fellow photographers to define when an image becomes a long exposure. Interestingly, there were a lot of different answers. Some claimed that it's more about the look of the image than the shutter speed itself, while others claim it's a combination of both.

However, the majority quickly agreed that a Long Exposure starts when you can no longer capture a sharp hand-held image.



Nikon D800 - Nikkor 70-200mm ƒ/2.8
ISO100 - ƒ/11 - 1/3 sec

What is Shutter Speed?

Long Exposure Photography is a technique that takes advantage of a slow (long) shutter speed. To fully be able to understand the basics of this technique we need to understand the fundamentals of our camera, especially of the shutter speed.

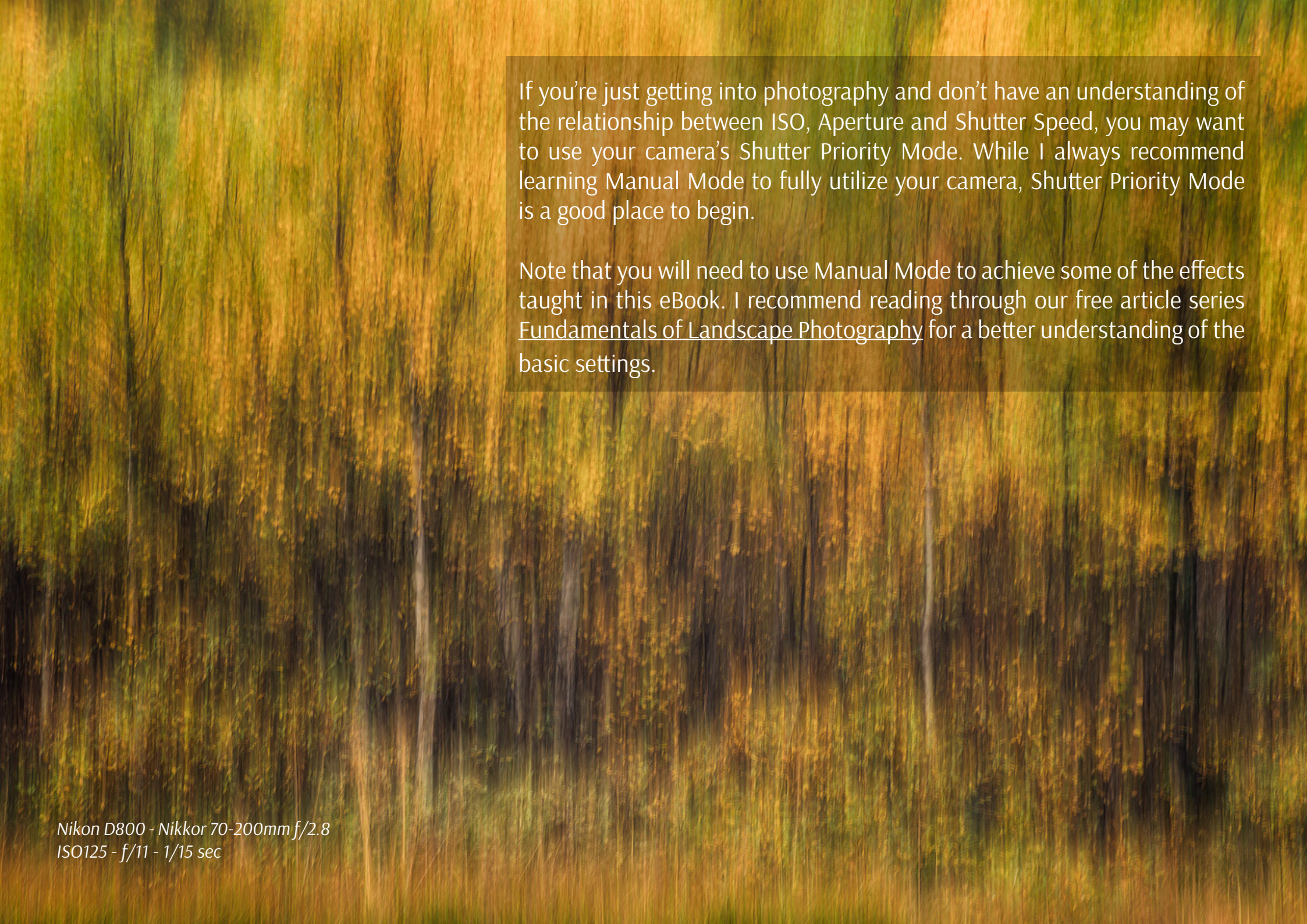
Shutter Speed is the amount of time the camera's shutter is open and is measured in seconds or fractions of seconds. A larger denominator, such as 1/1000, is a quicker shutter speed allowing less light to reach the sensor (ideal for freezing movement). A lower denominator, such as 1/10, is a slower speed where the shutter is open longer allowing more light to reach the sensor (capturing motion).

This means that the camera registers anything that moves while the shutter is open and, as a result, water looks like silk and cars leave a red light trail in certain images.

Nikon D800 - Nikkor 16-35mm ƒ/4
ISO80 - ƒ/11 - 1/8 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 0.6 sec

An easy way to see how the shutter speed changes the picture is to place your camera on a tripod and capture a series of images of a waterfall or a moving subject. Start by using a fast shutter speed of 1/1000 (which is a VERY short exposure) and work your way all the way up to 1 second. When you compare these images, you will see what happens as you decreased the speed, thus leaving the shutter open longer each time, i.e. creating a longer exposure.



If you're just getting into photography and don't have an understanding of the relationship between ISO, Aperture and Shutter Speed, you may want to use your camera's Shutter Priority Mode. While I always recommend learning Manual Mode to fully utilize your camera, Shutter Priority Mode is a good place to begin.

Note that you will need to use Manual Mode to achieve some of the effects taught in this eBook. I recommend reading through our free article series Fundamentals of Landscape Photography for a better understanding of the basic settings.

Nikon D800 - Nikkor 70-200mm f/2.8
ISO125 - f/11 - 1/15 sec

CHAPTER 2

Before Photographing: The Equipment

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 8 sec

Equipment for Long Exposure Photography

To capture images that require a slower shutter speed, you might need to expand your camera gear a little. There is some equipment that is considered essential for this technique and all of the gear mentioned below has a great impact on the overall quality of your final image. Also, it will let you be more flexible when photographing these scenes.

- Camera with a Bulb Mode function
- Tripod (Essential)
- Shutter Release (Essential when using Bulb Mode)
- ND Filters

Use a Tripod

I would go so far as to say that a tripod is necessary for landscape photography. However, it's absolutely *essential* for Long Exposure Photography; without one, you're not able to take advantage of using a slow shutter speed.

You might get creative and use rocks or other objects to rest your camera on but we both know that it's not nearly as reliable as using a tripod. When working with shutter speeds of many seconds, or even minutes, it's simply impossible to capture sharp images handheld.

I always recommend bringing a tripod even if you end up using a faster shutter speed than 1\60 sec.

You can find inexpensive tripods online or at mostly any photography store. While it might be tempting to get the cheapest one, you should consider investing in a solid tripod as it's a very important tool you'll be using a lot. In the long run, you'll save money on purchasing quality; trust me, I've broken some cheap ones!

Having a solid tripod is also beneficial when working in harsh and windy conditions. A sturdy tripod stands steadier in the wind and reduces the chances of it vibrating which would result in less sharp images.

Nikon D800 - Nikkor 16-35mm ƒ/4
ISO100 - ƒ/10 - 2.5 sec

Nikon D800 - Nikkor 70-200mm f/2.8
ISO100 - f/11 - 1/5 sec

Use a Shutter Release

A Remote Shutter is something many of us have heard repeatedly that we need to purchase, especially if you're into landscape photography. One of the main reasons to use a remote shutter is to minimize the vibration when capturing an image, resulting in sharper photos.

What you also might know is that your camera has a Delayed Shutter function, typically of 2 or 10 seconds. So, do you really need to purchase a remote shutter when you can create a similar effect directly in the camera? Let's look at some pros and cons with a remote shutter and a delayed shutter.

You don't need something as advanced as the Nikon MC-36A even though it will be beneficial in many cases

Nikon D810 - Nikkor 14-24mm f/2.8
ISO500 - f/2.8 - 6 sec

Delayed Shutter

Most digital cameras have a built in Delayed Shutter function. In fact, even the majority of smartphones have it.

A delayed shutter is, in simple words, a timer. It tells the camera to wait a specified amount of time before taking an image after pressing the shutter button. This gives you enough time to run in front of the camera and take a selfie but it also avoids being affected by the slight vibration created when pressing the release button.

This function is especially useful when using a slow shutter speed, with your camera mounted on a tripod, making it ideal for Long Exposure Photography. If you use a shutter speed of 0.5 seconds and press the shutter (with no delay), you'll see that the image will come out less sharp than if you use a delayed shutter.

Pros:

- It's a standard function in most digital cameras and smartphones
- It's free
- It reduces vibration and leads to a sharper image
- You manually set the delay to be between 2-10 seconds (on most cameras)
- You have the time to position yourself in the image after pressing the shutter button

Cons

- It's not flexible
- If you're photographing waves or something else with motion, it's hard to time the shutter and you might miss the shot
- In some cameras, the function and its settings are hard to locate and turn on

The image to the right is a good example of when you can use the delayed shutter function. Since you don't need to time a specific movement, such as a wave, you can wait 2 seconds from pressing the shutter until the image is taken.

Nikon D800 - Nikkor 16-35mm ƒ/4
ISO50 - ƒ/11 - 3 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 30 sec

Remote Shutter Release

Remote Shutters can vary in form, shape and price! Some are tiny and inexpensive while others are larger, with more options, but also more costly.

Choosing the right remote shutter can be a hassle sometimes as you might not know what you actually need. Some of you may only need a simple one to avoid any motion when taking the image while others may need something more advanced that lets you do interval timing or perhaps something that has a *Bulb lockup*.

When your need is established, you should consider whether you want a cable release or a wireless remote shutter. I won't get into the topic of which is better, but I recommend that you consider how you'll use it.

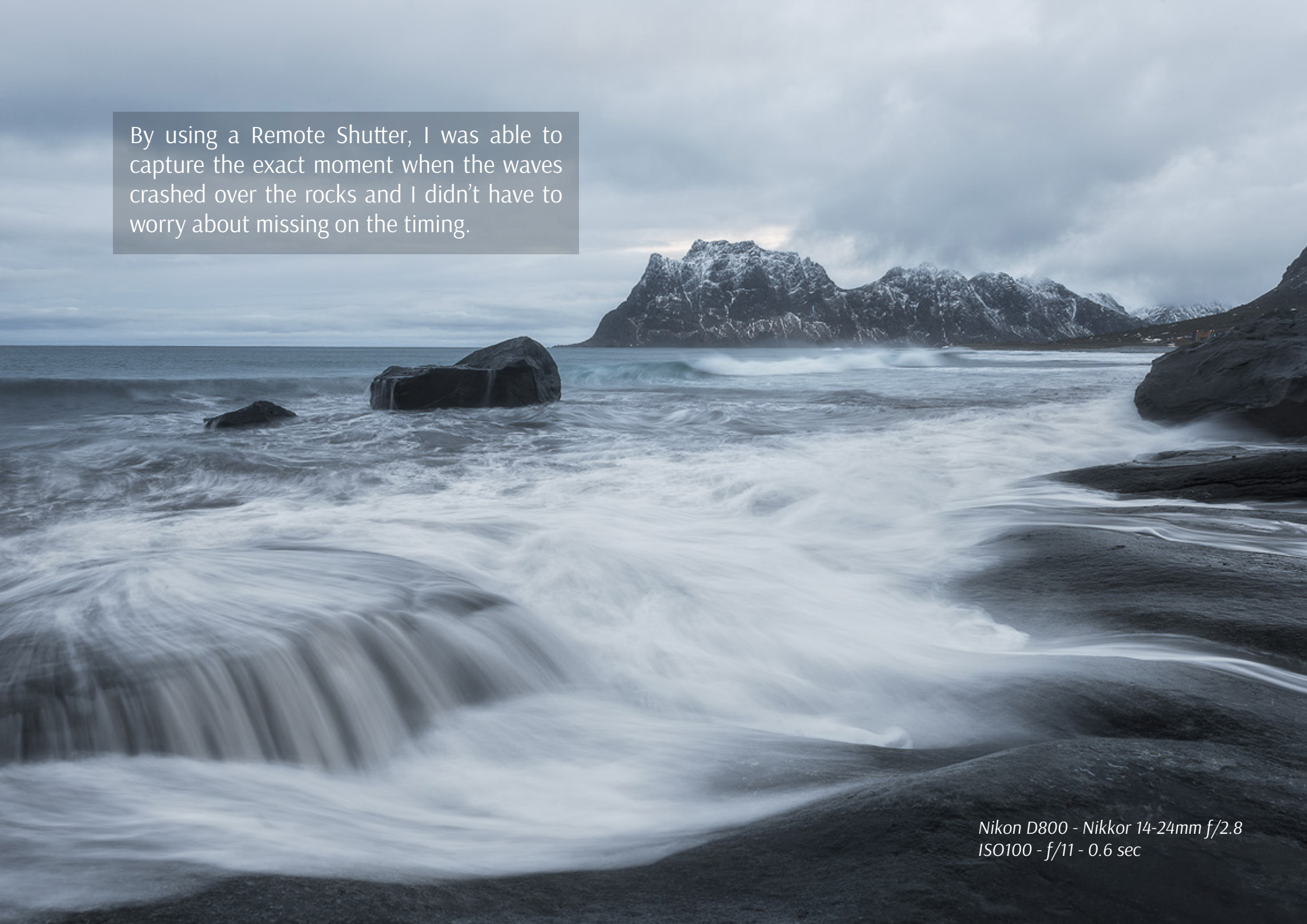
Pros

- Wireless remotes allow you to stand far away from the camera and take pictures
- Advanced models have many options such as interval timers
- You can use “Bulb Mode” without having to hold the camera’s release button and cause vibration
- Many models have LCD screens with a timer
- Take a picture at the exact moment you need

Cons

- More advanced models can be very pricy
- It takes extra space in your bag
- It might be hard to choose the right model
- Low-end cable releases tend to break easily
- Small, wireless remote shutters are easy to lose

Nikon D810 - Nikkor 14-24mm ƒ/2.8
ISO400 - ƒ/2.8 - 4 sec



By using a Remote Shutter, I was able to capture the exact moment when the waves crashed over the rocks and I didn't have to worry about missing on the timing.

Nikon D800 - Nikkor 14-24mm f/2.8
ISO100 - f/11 - 0.6 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 59 sec

For this image I could use a delayed shutter since I wasn't depending on taking the picture at an exact moment, i.e. there was no possibillity to "miss the shot".

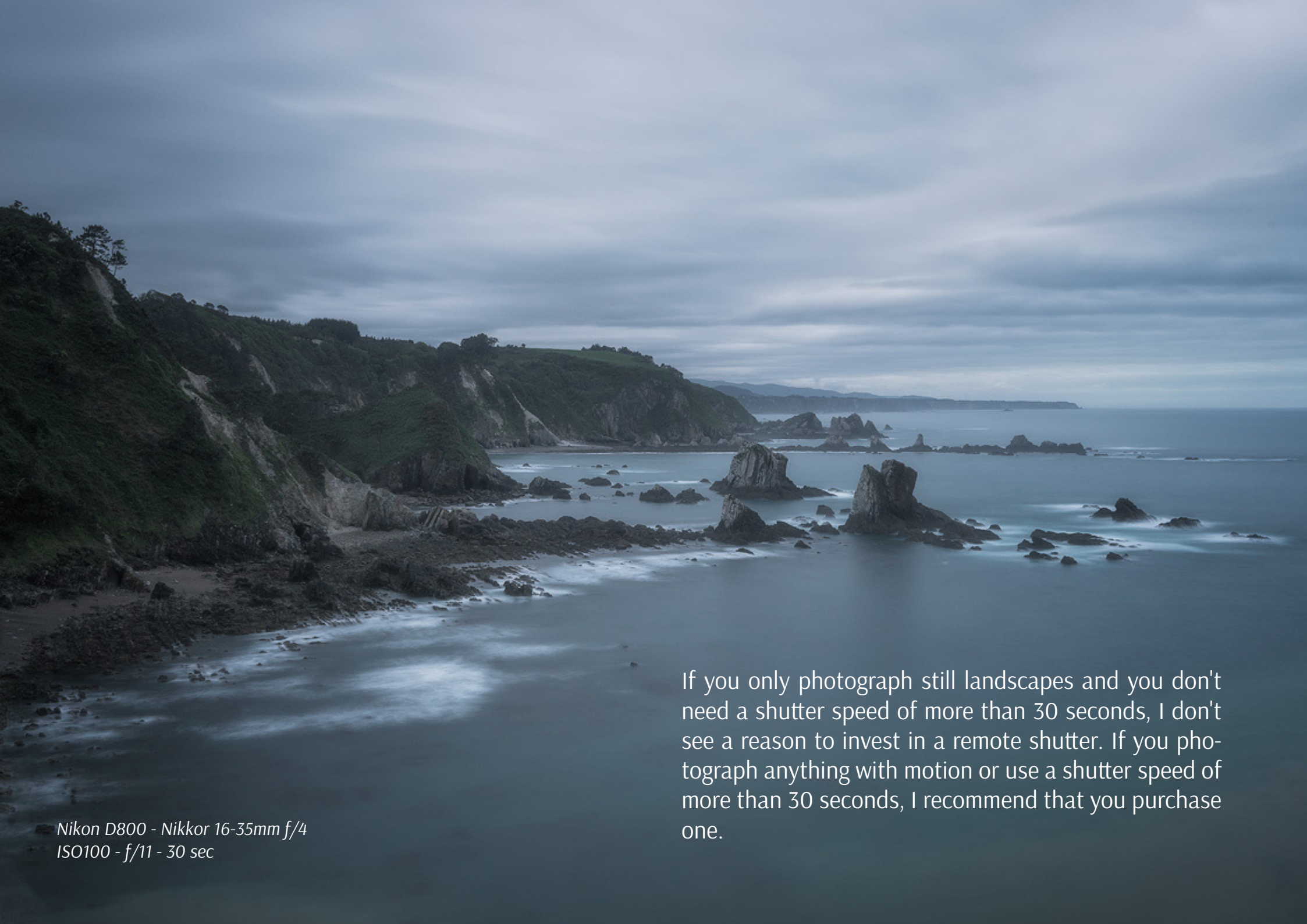
Which is best for Long Exposure Photography?

For traditional landscape photography both have their advantages. For Long Exposure Photography, however, the need is slightly different.

A lot of the time, you can't wait the extra two or three seconds (Delayed Shutter) before the image is taken; you'll miss the moment. When photographing rushing waves, you want to capture the image in the exact moment the wave looks correct or even shoot a burst of images as the wave is coming in; for this you need a remote shutter.

Another reason you should use a remote shutter for Long Exposure Photography is due to the fact that we often work with shutter speeds of more than 30 seconds, which is only possible in Bulb Mode. We will come back to Bulb Mode later on in chapter 4 but to use this mode, you need a remote shutter.

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 0.5 sec



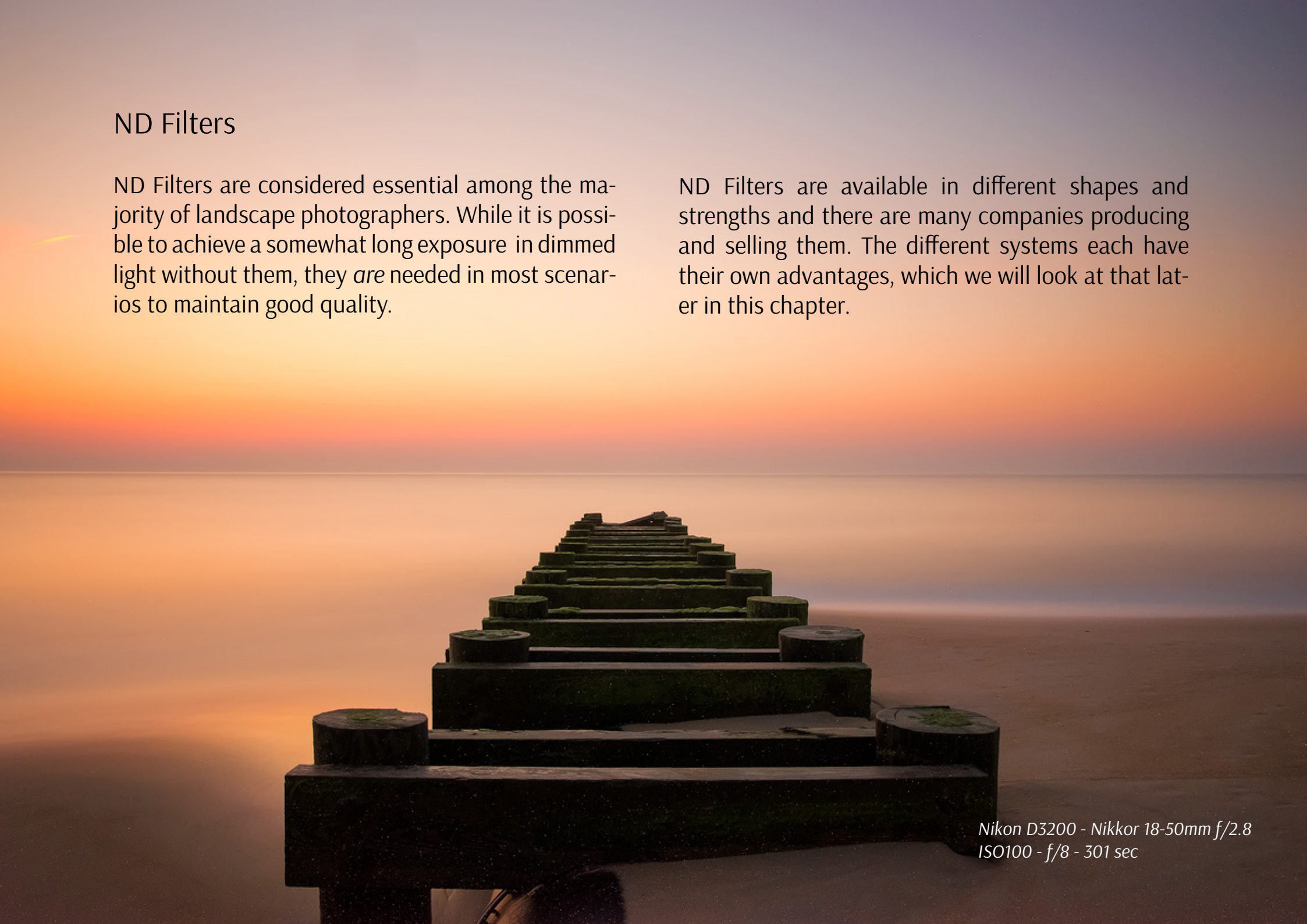
If you only photograph still landscapes and you don't need a shutter speed of more than 30 seconds, I don't see a reason to invest in a remote shutter. If you photograph anything with motion or use a shutter speed of more than 30 seconds, I recommend that you purchase one.

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 30 sec

ND Filters

ND Filters are considered essential among the majority of landscape photographers. While it is possible to achieve a somewhat long exposure in dimmed light without them, they *are* needed in most scenarios to maintain good quality.

ND Filters are available in different shapes and strengths and there are many companies producing and selling them. The different systems each have their own advantages, which we will look at that later in this chapter.



Nikon D3200 - Nikkor 18-50mm ƒ/2.8
ISO100 - ƒ/8 - 301 sec

What are Neutral Density Filters?

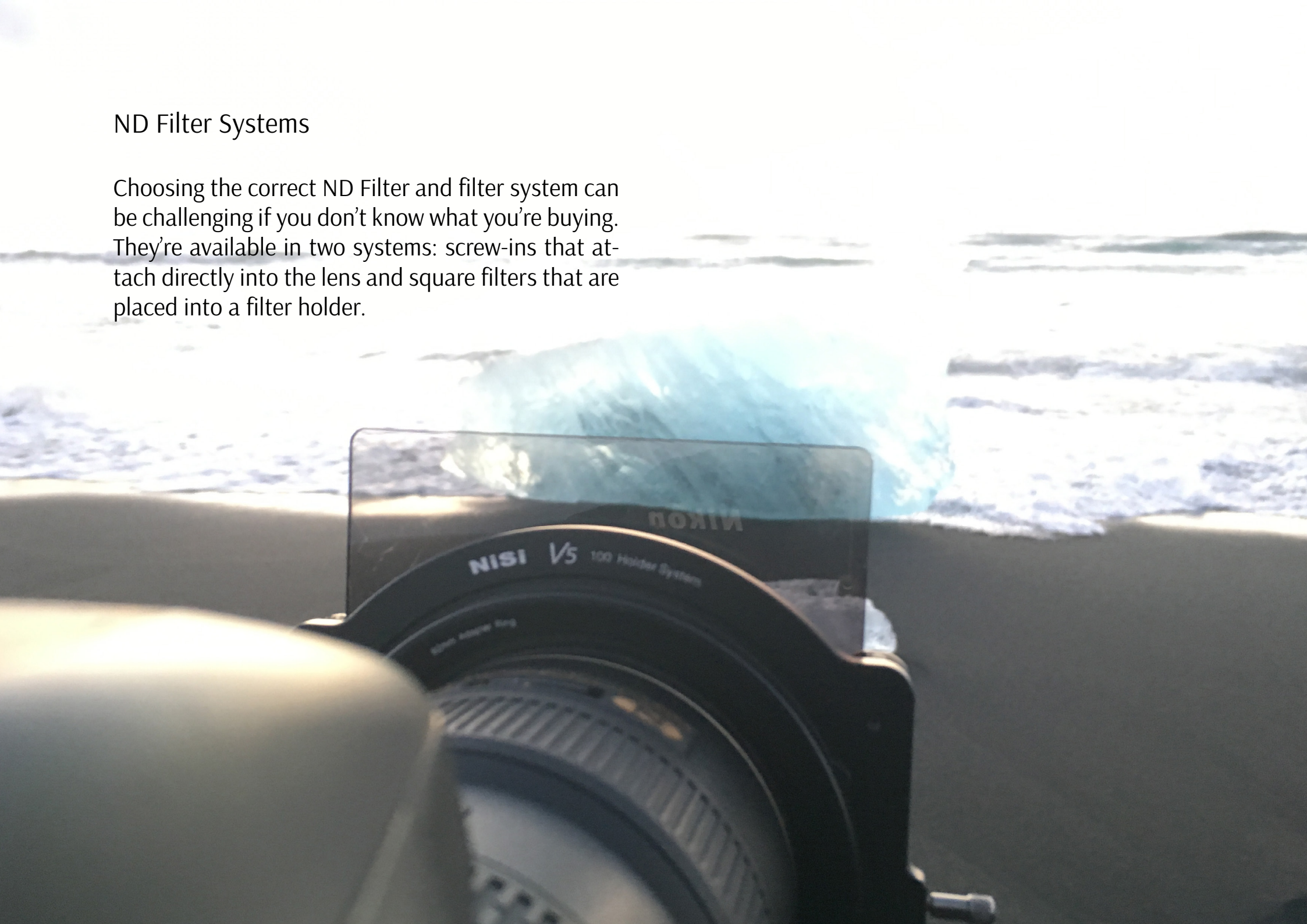
Neutral Density Filters (commonly referred to as ND Filters) are filters placed in front of the lens to reduce the amount of light entering the camera. This allows you to use a slower shutter speed to create motion blur and/or create a shallower depth of field.

Let's say that you're photographing a waterfall. To achieve the effect you want on the water, you prefer a shutter speed of five seconds. It is possible to get a five second exposure in dimmed light by using a narrow aperture but if you want to keep the sharpest/ideal aperture in bright light, it's not possible to get a correctly exposed image with this shutter speed without an ND Filter. The filter reduces the amount of light entering your camera, allowing you to use a longer exposure.


Singh-Ray Reverse Graduated ND Filter used to darken the sky and get a balanced exposure. A Reverse GND Filter is darkest at the transition point and is typically used when the sun is at a low position or just below the horizon. To learn more about Graduated Neutral Density Filters please read my free article Introduction to Graduated ND Filters

ND Filter Systems

Choosing the correct ND Filter and filter system can be challenging if you don't know what you're buying. They're available in two systems: screw-ins that attach directly into the lens and square filters that are placed into a filter holder.



Nikon D3200 - Nikkor 18-50mm f/2.8
ISO100 - f/8 - 131 sec

Screw-in ND Filters

Screw-in filters are screwed into the front of the lens. The benefit of using a screw-in filter, as opposed to a square filter, is that there is no gap between the filter and the lense where a little light can enter. (Personally, I don't find this to be a problem and I'll normally factor it into my calculations for finding the correct shutter speed.)

The downside to screw-ins is the challenge of using multiple filters simultaneously, which you often do. If you want to use both an ND and a Graduated ND Filter to get a specific effect, you'll see an unwanted vignette; the edges of the filters appear in your image creating dark edges around your image. Normally, this is easy to fix in Adobe Lightroom or Photoshop but the more filters you use, the harder it gets!

The image to the left was captured with a B+W 10 Stop Screw-In Filter

Screw-in ND Filter mounted in front of a Nikon 16-35mm

Pros

- Less Expensive
- You don't need a filterholder
- Takes less space
- Easy to use
- It's quick to mount

Cons

- Graduated Filters don't work well
- It's not ideal with multiple filters
- Normally results in more vignetting
- Variable ND Filters have strong vignetting
- Easy to lose on smaller lenses

Nikon D800 - Nikkor 16-35mm ƒ/4
ISO100 - ƒ/11 - 90 sec

Square System ND Filters

The square filter system is quite different than the screw-in filters. It requires an adapter and a filter holder which, normally, are purchased separately.

First, the adapter, not the filter itself, is screwed onto the lens and then the filter holder is clipped onto the adapter. The filters can now be placed in front of the lens in the holder.

This system makes it possible to use multiple filters simultaneously without getting the same amount of vignette as with the screw-in system.

Occasionally you might see a case of darkened edges when you use an ultra wide-angle lens but rarely as much as when using screw-ins. You can also find adapters that let you place a screw-in polarizer filter in front of the square filters; just remember to buy one that is big enough so you don't get the despised vignette.

Brands such as NiSi have also developed systems that let you place the polarizer within the filter holder, which I've found extremely beneficial in my work.

Keep in mind that the diameter of your lenses might vary so be sure to get an adapter for each of the lenses you wish to use. (This is the same for the screw-on system as well.)

What System Should You Use?

I'll start by saying that both filters have their advantages and disadvantages, most of which are mentioned above. Personally, I have been using (and recommending) the square filter systems for the last few years as I find this to be more practical for my photography.

The square system might be a little pricy so, if you're just getting started with Long Exposure Photography and don't yet know if it's something for you, the screw-in filters might be a good place to begin. On the other hand, if you wish to really improve your photography and you're willing to spend a little extra money on filters, go for the square system.

Being able to use multiple filters simultaneously is a winning factor for me. I often combine a Neutral Density filter and a Graduated ND filter. Again, with the screw-in system, this would cause a serious problem with vignettes and you would also be limited in adjusting the GND according to the horizon.

Nikon D800 - Nikkor 16-35mm ƒ/4
ISO100 - ƒ/11 - 151 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/9 - 139 sec

Differences Between ND Filters

2 Stop, 6 Stop or 10 Stop are common expressions among those working with Neutral Density filters. Do you know what they mean?

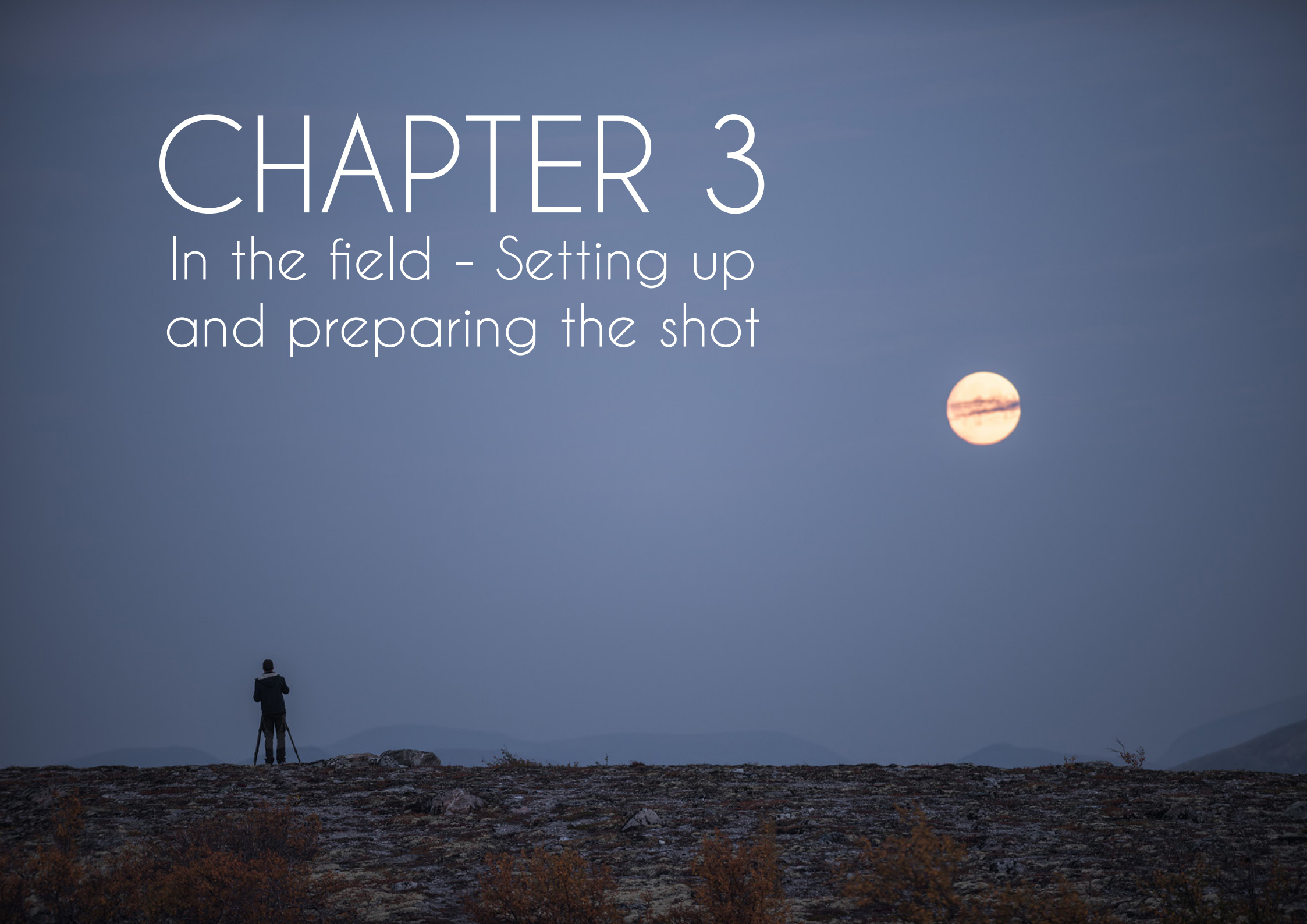
In simple terms, they describe each individual filter's strength and how much less light is let through by using that specific filter.

Popular among many, especially those new to Long Exposure Photography, is the 10 stop. This is the most referred-to filter when talking about this technique. If you wish to achieve silky water or streaking clouds, the 10 stop filter will let you to use a shutter speed that is 1,000 times longer than what you would achieve without a filter. In other words it reduces the amount of light reaching the sensor by 1,000! That's pretty impressive, right? That means that a shutter speed of 1/60 becomes 16.7 seconds!

We will come back to how to photograph with the different filters in Chapter 4.

CHAPTER 3

In the field - Setting up and preparing the shot



Now that we have gone through the essential and recommended equipment, it's time to get out and take some shots. This is where the fun part starts!

As mentioned in the introduction, Long Exposure Photography can work in many different scenarios. However, since this eBook is focused on Landscape Photography, I won't go into detail about architecture or other examples where it is also a popular technique. Still, the approach is similar regardless of the scene you wish to photograph.

Nikon D810 - Nikkor 14-24mm f/2.8
ISO640 - f/2.8 - 6 sec

Composition is one of the most important factors in photography. If you've been into photography for a while, you may already know that but it's easy to forget about the composition when doing Long Exposure Photography as the image can look *cool* at first glance due to the dragged clouds or silky water. Please, don't fall into the trap and disregard the composition; you will regret!

Regardless of what techniques you use to capture an image, composition is just as important. Look for elements such as rocks, trees, rivers, flowers or other foreground elements in your scene that will work as leading lines to help guide the viewer's eyes.

It's important to know that you actually have an extra compositional element to keep in mind when using a long shutter speed. What direction are the clouds traveling? What about the flow in the water? Both of these are natural elements you can benefit greatly from in the composition. Dragged clouds might help lead your eye towards the main subject just as rushing waves will.

Ask yourself this simple question: What am I photographing? If the sky is the interesting part, it should be given more space but if it's the water or flowers in the foreground, they should.

Nikon D800 - Nikkor 14-24mm ƒ/2.8
ISO640 - ƒ/2.8 - 5 sec

Do You Need to Use a Long Exposure?

After purchasing your first ND filter, you might want to use it every time you're out with the camera. I've been there and I'm pretty sure most others have too.

Regardless of how exciting it is to use in the beginning, ask yourself this simple question: will this image benefit from a long exposure? Before you jump to a conclusion and say yes, let's look at some of the instances where a slow shutter speed is not beneficial or even needed.

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 241 sec

- **No clouds or water**. If the scene you're photographing doesn't have clouds, water or any other motion you wish to enhance, using an ND Filter is not necessary. When photographing a mountain on a sunny & cloudless day, it's better to keep the filter in your backpack.
- **You wish to freeze motion**. When you wish to freeze motion and use a quick shutter speed – let the filters be. The main purpose of an ND filter is to lengthen the shutter speed and obscure movement.
- **Photographing handheld**. If you're not planning to use a tripod, avoid using a long exposure. Capturing sharp images when dealing with shutter speeds of seconds or even minutes is not possible.

In most other scenarios that are not mentioned above, using a long shutter speed can be beneficial for the image.

The image to the right will look almost the same with a shutter speed of 1/200 or 30 seconds. In other words, it will not benefit from a Long Exposure. If you look closely, however, you see a group of people on the left side of the image. Had we used a long exposure they would not have been visible as they were moving around.

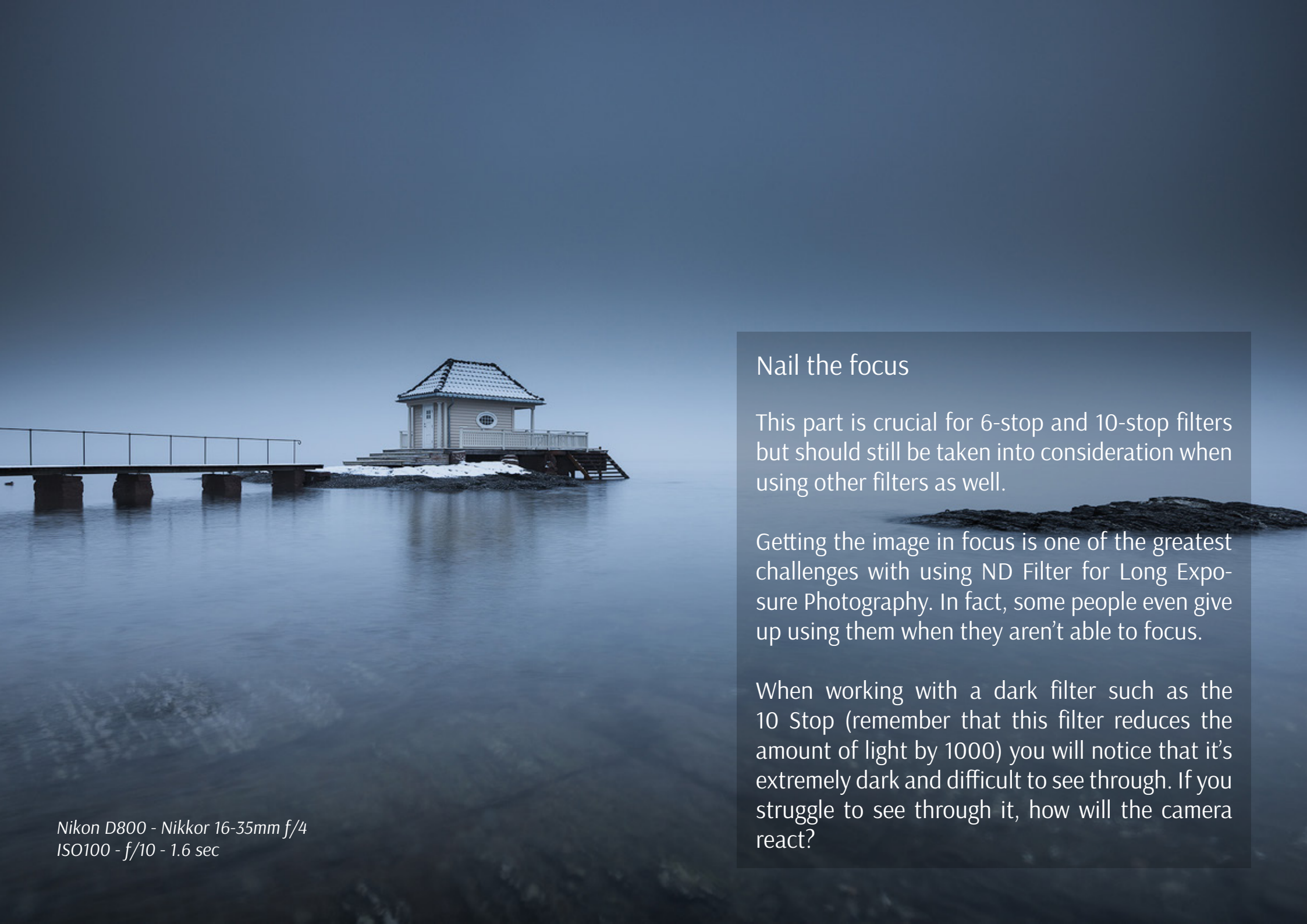
Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/7.1 - 10 sec

That being said, there are always exceptions to the rules. Rules are there for a reason but they should not be followed strictly as many images actually benefit from breaking them.

The image to the left is a typical example of this. It's a blue sky without clouds and the ocean is barely visible in the background. In other words, this is not an image that would benefit from a long exposure, right?

Since it was quite windy that particular morning, the grass had a lot of motion which made me bring out the ND Filters. By using a shutter speed of a few seconds, I was able to get an artistic effect in the grass which highly benefited the image.

Never let the rules dictate your creativity. If you get an idea or even if you're just curious about how something would look, try it! That's how we learn and keep improving our creativity and photography.



Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/10 - 1.6 sec

Nail the focus

This part is crucial for 6-stop and 10-stop filters but should still be taken into consideration when using other filters as well.

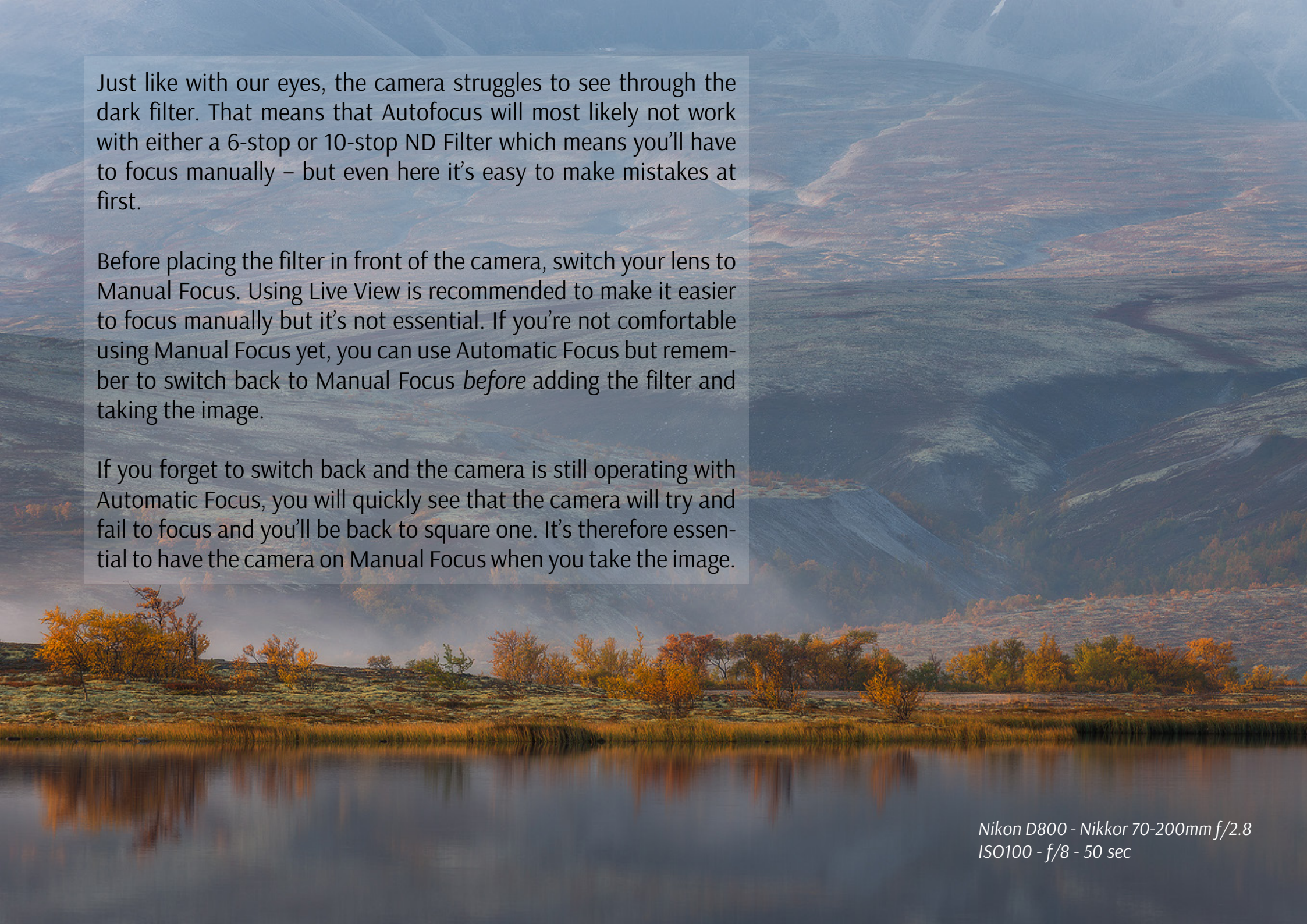
Getting the image in focus is one of the greatest challenges with using ND Filter for Long Exposure Photography. In fact, some people even give up using them when they aren't able to focus.

When working with a dark filter such as the 10 Stop (remember that this filter reduces the amount of light by 1000) you will notice that it's extremely dark and difficult to see through. If you struggle to see through it, how will the camera react?

Just like with our eyes, the camera struggles to see through the dark filter. That means that Autofocus will most likely not work with either a 6-stop or 10-stop ND Filter which means you'll have to focus manually – but even here it's easy to make mistakes at first.

Before placing the filter in front of the camera, switch your lens to Manual Focus. Using Live View is recommended to make it easier to focus manually but it's not essential. If you're not comfortable using Manual Focus yet, you can use Automatic Focus but remember to switch back to Manual Focus *before* adding the filter and taking the image.

If you forget to switch back and the camera is still operating with Automatic Focus, you will quickly see that the camera will try and fail to focus and you'll be back to square one. It's therefore essential to have the camera on Manual Focus when you take the image.



Nikon D800 - Nikkor 70-200mm ƒ/2.8
ISO100 - ƒ/8 - 50 sec

How to Calculate the Shutter Speed

When asking you, the CaptureLandscapes readers, what you find most challenging with Long Exposure Photography there was one reply that stood out: *I struggle with finding the correct shutter speed.*

This is, indeed, a challenge. A lot of the time you're using such dark filters that Automatic Mode won't function properly, or at least, won't give a good result. While it takes time to understand how the calculations work, you'll soon be able to set an approximate shutter speed based on just looking at the light.

In the following pages, we'll look at two methods to find the correct shutter speed.

Nikon D800 - Nikkor 16-35mm ƒ/4
ISO100 - ƒ/11 - 91 sec

The Easy Way

Technology can both be a pain in the ass and a life-saver. There are tools created for Long Exposure Photography that make your life and photographic experience slightly easier.

NDCalc is a smartphone application I found very useful when first getting into Long Exposure Photography. This app calculates the correct shutter speed you need, based upon the shutter speed you use without a filter. That's why I recommend to capture a test shot without filters when you've found your composition and nailed the focus.

It can't really get much easier than that, right? It also has a visual countdown so you know when to end the exposure (this is great if you use a low end remote shutter release and use Bulb Mode).

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 90 sec

The Important Way

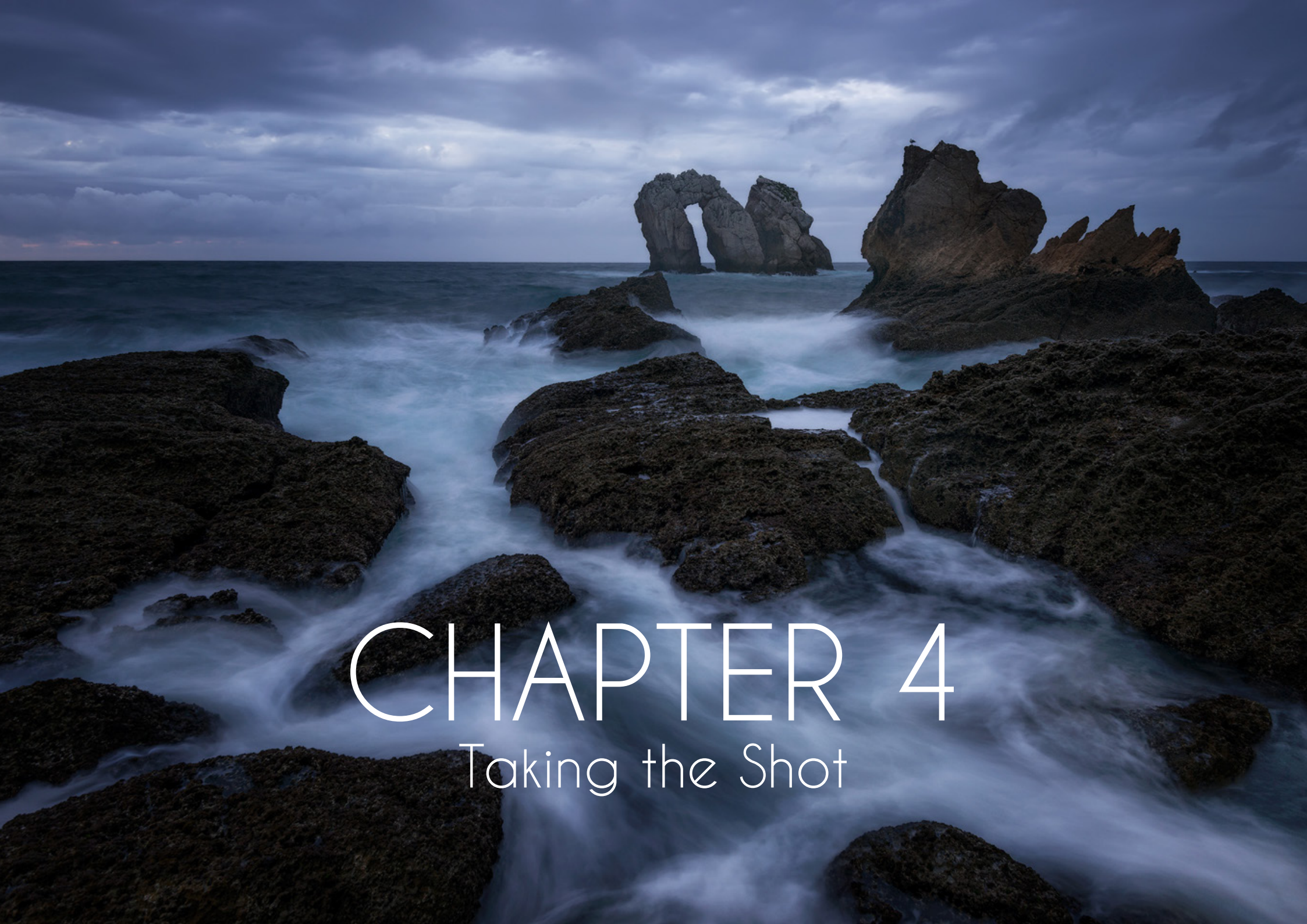
While it's easy and comfortable to find your shutter speed by using apps such as NDCalc, it's important to understand how the calculation works.

Even though I often relied on NDCalc as a beginner, I also decided to learn and understand how the shutter speed is calculated. This was extremely beneficial for me and is the main reason why, today, I can calculate the approximate shutter speed just by looking at the light.

It really isn't that difficult, just a bit confusing in the beginning.

Let's use the 10 Stop ND Filter as an example. This filter lets you lengthen your shutter speed by 1,000 times; so, if you need a shutter speed of 1/125 without filters you can now extend it to 8 seconds (1 divided by 125 x 1000 = 8). If you needed 1/30 you can use 33 seconds (1 divided by 30 x 1000 = 33.3)!

Filter	Density	Stops	Shutter speed (in seconds)							
NO FILTER	0	0	1/4000	1/1000	1/250	1/60	1/15	1/4	1	4
ND2	0.3	1	1/2000	1/500	1/125	1/30	1/8	1/2	2	8
ND4	0.6	2	1/1000	1/250	1/60	1/15	1/4	1	4	16
ND8	0.9	3	1/500	1/125	1/30	1/8	1/2	2	8	30
ND16	1.2	4	1/250	1/60	1/15	1/4	1	4	16	60
ND32	1.5	5	1/125	1/30	1/8	1/2	2	8	30	120
ND64	1.8	6	1/60	1/15	1/4	1	4	16	60	240
ND100	2	6 2/3	1/40	1/10	1/2	2.5	10	40	160	660
ND256	2.4	8	1/15	1/4	1	4	16	60	240	900
ND400	2.6	8 2/3	1/20	1/5	1.6	6	25	100	360	1560
ND500	2.7	9	1/8	1/2	2	8	30	120	480	1800
ND1000	3	10	1/4	1	4	16	60	240	900	3600



CHAPTER 4

Taking the Shot

Nikon D800 - Nikkor 14-24mm f/2.8
ISO100 - f/2.8 - 10 sec

The Different Shutter Speeds

Let's make one thing clear: Long Exposure Photography is not just Long Exposure Photography.

The shutter speeds we deal with can vary from a fraction of a second to hours (yes hours!) As you might imagine, an exposure of one second will look quite different than a two-minute exposure.

ND Filters have a real impact on the shutter speed. The darker the filter, the longer the exposure. However, the darker it gets outside, the longer exposure you need with even the lightest ND Filters.

The two images to the right work as great examples of how the shutter speed impacts an image. While both are processed in a similar manner, there's a huge difference between the two.

While both images are long exposures, the completely blurred water movement in the bottom shot is clear evidence that it has a slower shutter speed than the exposure at the top.

There's no right or wrong and ultimately it all depends on what you as the artist prefer. Just keep in mind what the difference is between a "short long exposure" and a "long long exposure".

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 1/5 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 20 sec

Shorter Exposures

When using a Circular Polarizer or a light ND Filter, you're able to decrease (lengthen) the shutter speed by 1.5-3 stops. This means that you normally won't be dealing with exposures of more than a few seconds (unless it's dark outside).

Shutter speeds from 0.5-2 or 3 seconds will give a completely different result than a shutter speed of 30 seconds. What makes these kinds of shorter long exposures different is that rather than completely blurring all motion, most of the textures remain.

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 0.5 sec

Pros

- Water keeps its texture while still having some blur
- Waves make nice shapes
- You don't need a remote shutter (but it's still recommended)
- You don't need filters (it depends on the brightness outside)
- Slowly moving elements will be frozen while faster moving elements will be blurred

Cons

- Unless clouds are very fast, you won't see any effect in the sky
- Some textures might remain sharper than you desire
- Camera/tripod shake is more visible

Nikon D800 - Nikkor 70-200mm f/2.8
ISO80 - f/11 - 0.4 sec

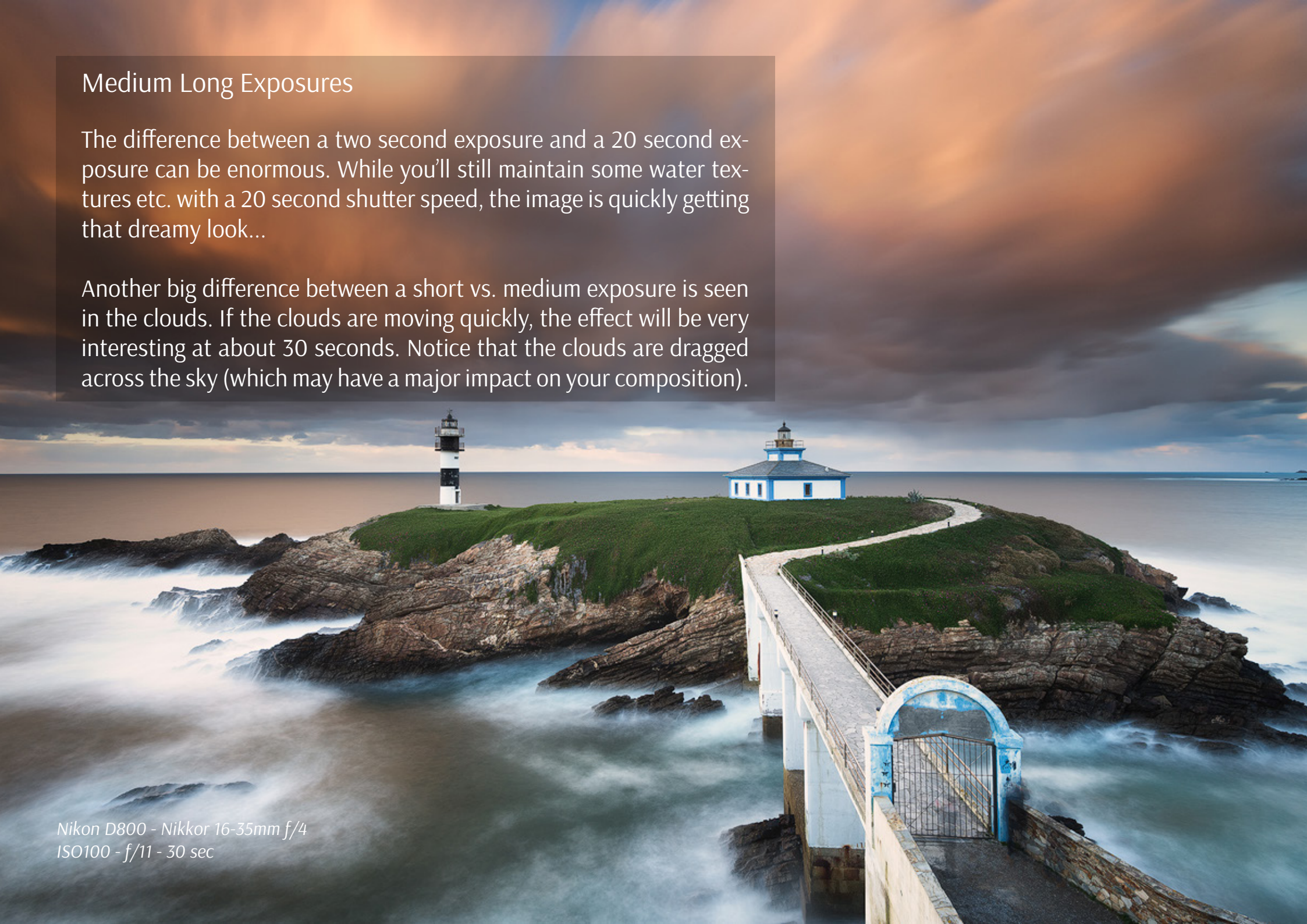
Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 1.6 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 1/3 sec

Medium Long Exposures

The difference between a two second exposure and a 20 second exposure can be enormous. While you'll still maintain some water textures etc. with a 20 second shutter speed, the image is quickly getting that dreamy look...

Another big difference between a short vs. medium exposure is seen in the clouds. If the clouds are moving quickly, the effect will be very interesting at about 30 seconds. Notice that the clouds are dragged across the sky (which may have a major impact on your composition).



Nikon D800 - Nikkor 16-35mm ƒ/4
ISO100 - ƒ/11 - 30 sec

The most common ND Filters for exposures between 10-30 seconds are 3 Stop and 6 Stop. It's been said before but it's important to remember that how long the exposure can be depends on the time of day and brightness outside. You can use a 6 Stop ND filter for 30-second exposures during sunset or late evening but as it gets darker, you'll need to lengthen your exposure time or switch to a lighter filter such as the 3 Stop.

Nikon D800 - Nikkor 16-35mm ƒ/4
ISO80 - ƒ/11 - 10 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 30 sec

Long Exposures (Bulb)

For the really long exposures, you need to bring out the 10 Stop filter (or even darker ones) unless you're photographing at night (which we will come back to later).

Bulb Mode is required to capture images with a shutter speed of more than 30 seconds. The location of this mode varies between the different camera manufacturers. On Canon, it's a separate mode (B) that is usually found on the same dial as Shutter Priority (TV) or Aperture Priority (AV); for Nikon, you locate Bulb in Manual Mode when scrolling past the option to have a shutter speed of 30 seconds.

This type of long exposure can be from 30 seconds up to many hours.

Nikon D800 - Nikkor 16-35mm ƒ/4
ISO100 - ƒ/11 - 35 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 332 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 245 sec

Long Exposure Seascapes

Nikon D800 - Nikkor 16-35mm f/4
ISO200 - f/10 - 30 sec

Seascape Photography can be incredibly rewarding but at the same time equally dangerous for both you and your camera. There are many elements to take into consideration and the last thing we want is for you or your equipment to be taken by the waves.

Photographing seascapes involves a different set of environmental conditions and risks than photographing still landscapes; dealing with these factors can often be challenging and, in worst case, result in not being able to capture the image you aimed for.

Nikon D800 - Nikkor 16-35mm ƒ/4
ISO100 - ƒ/11 - 74 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 0.5 sec

Know the Tides

Most photographers, myself included, will do almost anything to get a great image. Unfortunately, this sometimes involves a certain amount of risk. We climb onto the end of cliffs and we take one step closer to the waves than we probably should but we don't do it without being aware of the dangers.

One of the biggest challenges when photographing seascapes is the constantly changing tide level. Some places are only reachable during low tide and if you don't pay attention, or haven't researched the tide tables, you might find yourself stuck or even taken by the ocean. When planning to photograph seascapes, it's crucial that you know when the tide will be high and low.

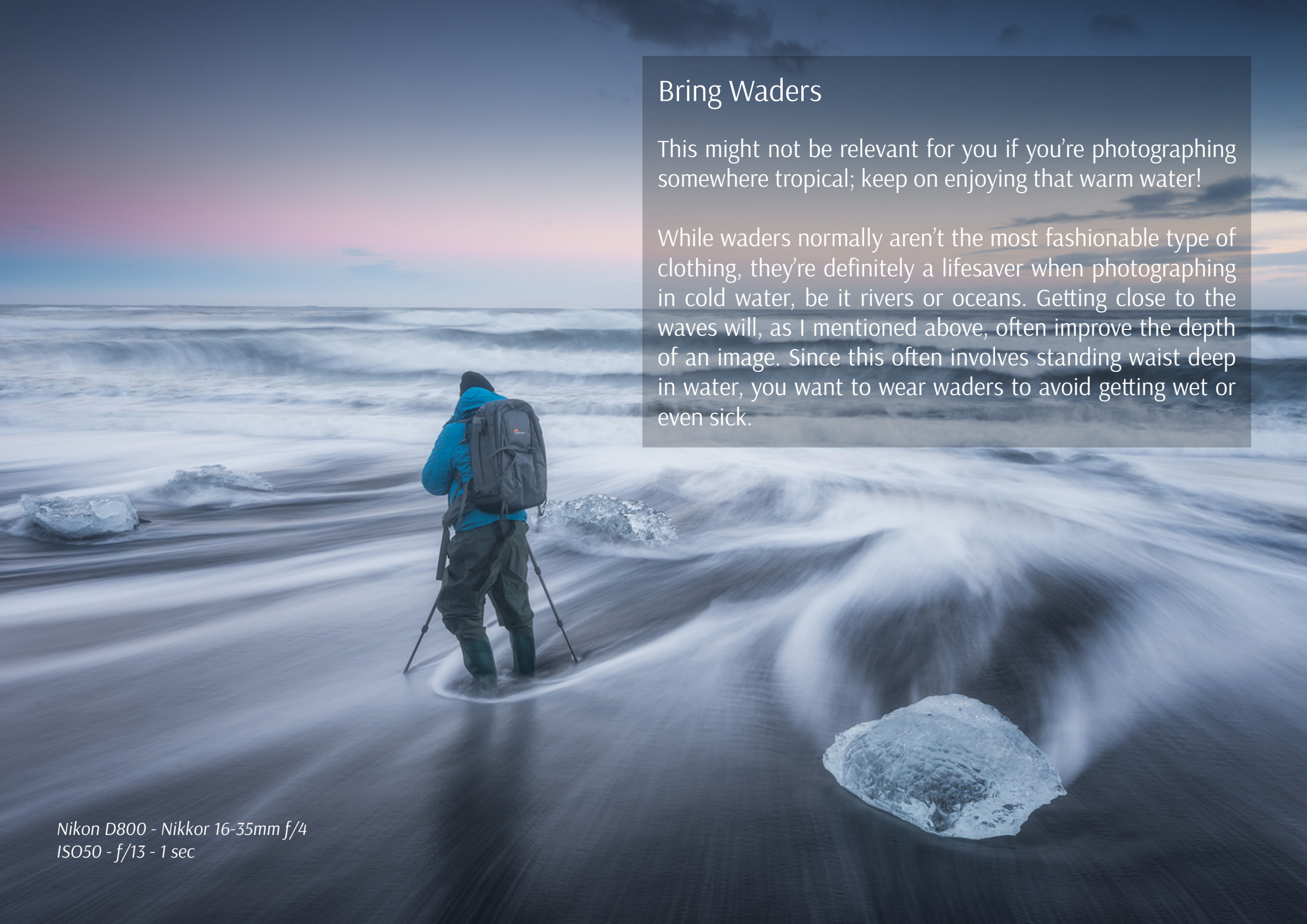
Knowing the tides isn't only a security measure, though. In fact, many locations can appear completely different during high tide than at low tide. An example of this is Playa de Barrika in northern Spain. During high tide it is nothing special, barely much of a beach at all and not worth visiting. When the tide is low, however, it's one of the most spectacular beaches in northern Spain.

Get Close to the Action

Getting close to your subject can greatly benefit your image when photographing moving elements such as water. Having a wave splash in the foreground or streak towards you will, in most cases, help lead the viewer's eye towards the main subject and also enhance the depth.

When shooting close to the water, pay extra attention to the waves. The last thing you want is for one to take your camera.

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 0.5 sec



Bring Waders

This might not be relevant for you if you're photographing somewhere tropical; keep on enjoying that warm water!

While waders normally aren't the most fashionable type of clothing, they're definitely a lifesaver when photographing in cold water, be it rivers or oceans. Getting close to the waves will, as I mentioned above, often improve the depth of an image. Since this often involves standing waist deep in water, you want to wear waders to avoid getting wet or even sick.

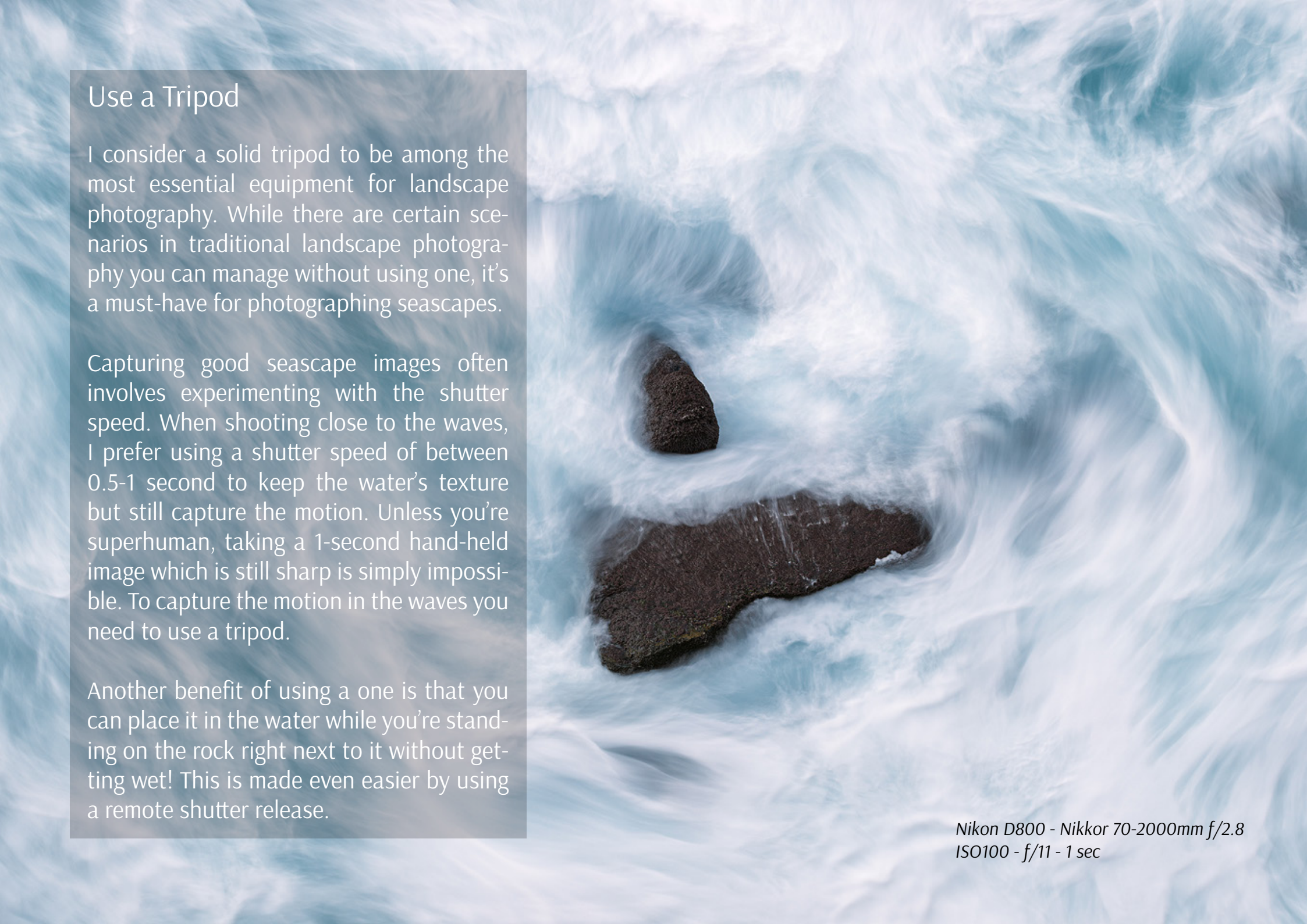
Nikon D800 - Nikkor 16-35mm f/4
ISO50 - f/13 - 1 sec

Use a Tripod

I consider a solid tripod to be among the most essential equipment for landscape photography. While there are certain scenarios in traditional landscape photography you can manage without using one, it's a must-have for photographing seascapes.

Capturing good seascape images often involves experimenting with the shutter speed. When shooting close to the waves, I prefer using a shutter speed of between 0.5-1 second to keep the water's texture but still capture the motion. Unless you're superhuman, taking a 1-second hand-held image which is still sharp is simply impossible. To capture the motion in the waves you need to use a tripod.

Another benefit of using a one is that you can place it in the water while you're standing on the rock right next to it without getting wet! This is made even easier by using a remote shutter release.



Nikon D800 - Nikkor 70-2000mm ƒ/2.8
ISO100 - ƒ/11 - 1 sec

Use Filters

While an exposure of up to 1 second can be possible to achieve by using a low ISO and narrow aperture during sunset, anything longer will require the use of ND Filters. Again, these filters are dark glasses that you place in front of your lens to reduce the amount of light getting in, ultimately allowing you to use a longer shutter speed to achieve some of those great effects we've discussed earlier in the book. Remember, a shutter speed of 0.5 seconds will capture the motion but also keep the textures while a 30 second shutter speed will blur the water and give a silk-like effect.

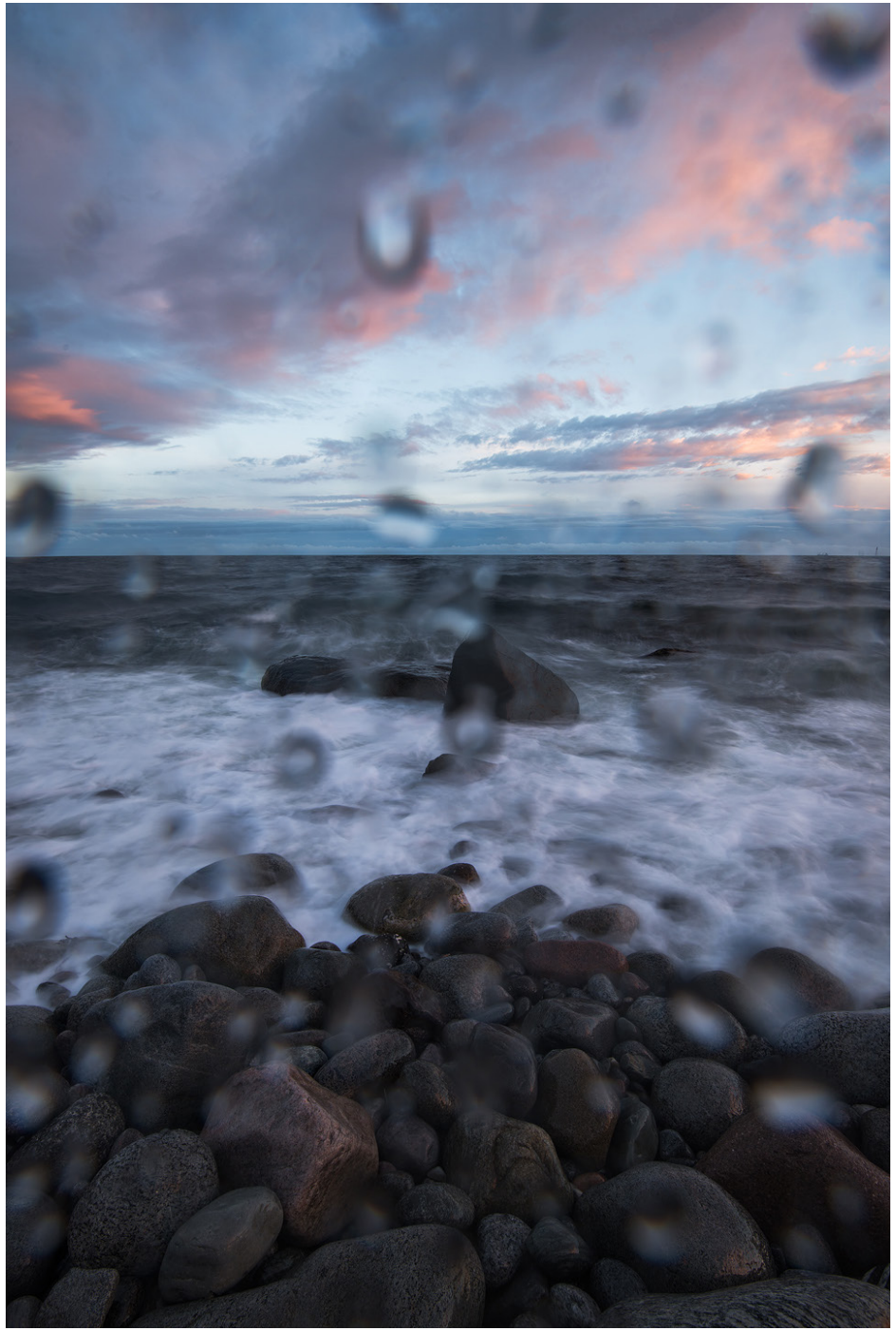
Why wait? Experimenting with the shutter speed can have a real impact on your image.

Using a Graduated ND Filter and/or ND Filter can have a great impact on the image. Here you see the difference between not using any filters and combining the two.

Bring Microfiber Cloths

If there's one thing you will learn from photographing close to the waves, it's that your lens will get drops of water on the front element. You will avoid damaging the lens by being careful but keeping it dry is not easy. I always bring a couple of microfiber cloths and I keep at least one in my pocket when photographing seascapes.

Time is often limited and everything happens fast when photographing waves and seascapes. Having a microfiber cloth easily accessible will make it easy to quickly clean your lens between shots. You won't need to do a thorough cleaning; the point is just to wipe off the drops.



Nikon D800 - Nikkor 16-35mm f/4
ISO50 - f/11 - 1 sec

Clean your Lens with Pre-Moistened Lens Cleaning Wipes

After a session by the coast, it's not only your skin that feels sticky from the salt. Your lens is also most likely covered in a thin layer of salt which, over time, can become annoyingly visible on your images. Instead of waiting until the lens is visibly dirty, I recommend you always clean your lens with a pre-moistened lens cleaning wipe when you're done photographing.

Unlike much other photography equipment, pre-moistened lens cleaning wipes are very inexpensive. I use the Zeiss Pre-Moistened Lens Cleaning Wipes which cost as little as $20 for 400 wipes.

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 1.3 sec

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 10 sec

Be Patient

When photographing beautiful scenery, it's easy to become overly excited; that's something that happens to most of us. What's important to remember when photographing seascapes, though, is the constantly changing elements in front of us. Knowing the tides is essential as mentioned in the first tip. However, it's equally important to spend a few minutes analyzing the waves before you start photographing.

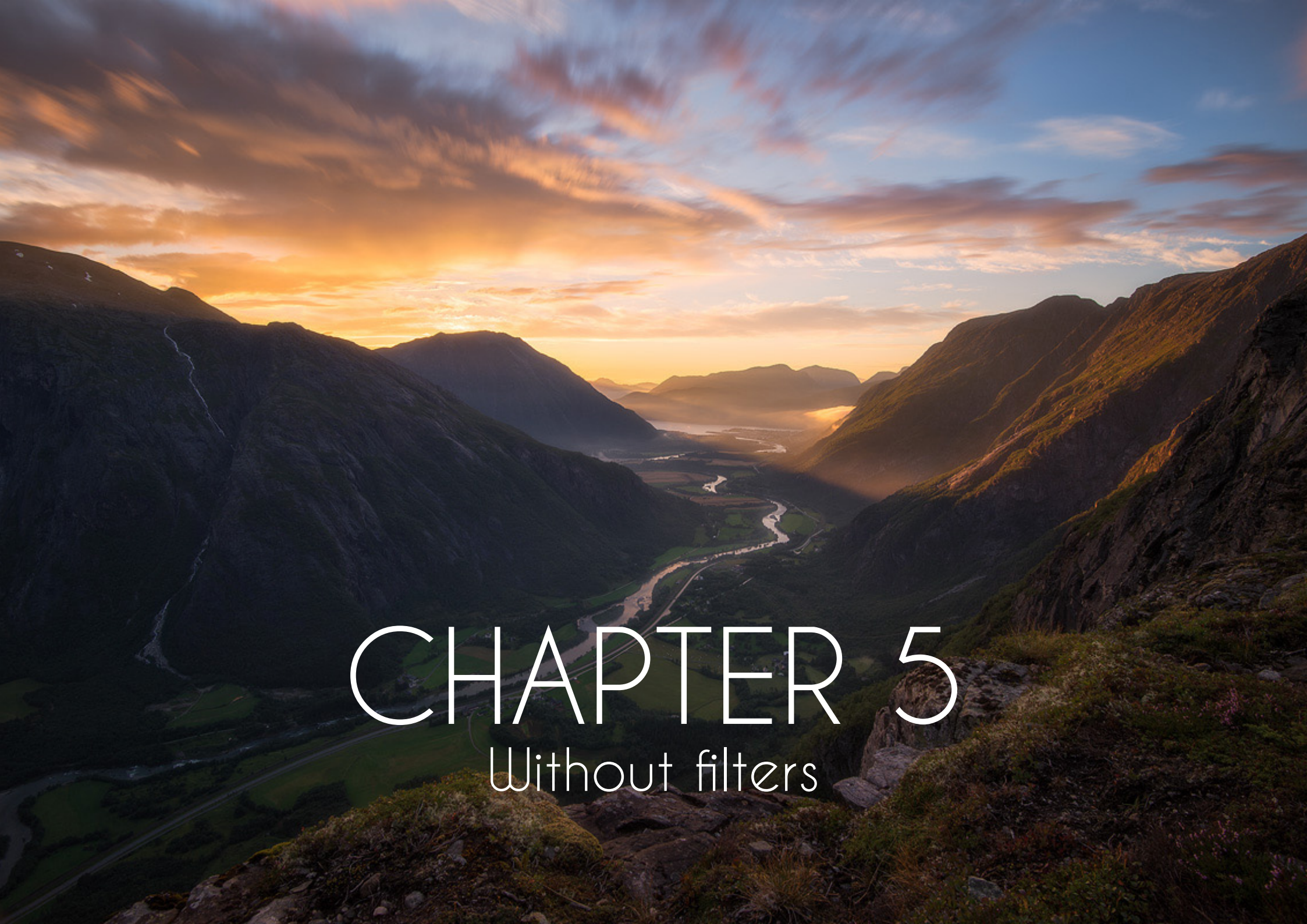
Way too often have I witnessed a photographer lose a camera in the waves.

An example is a gentleman I saw in Spain: along with a few others, he walked out to a rock far out on the beach. What all three of them failed to do was pay attention to how high the water went on the larger waves that came every couple of minutes.

Suddenly, a large wave crashed in front of them forcing them to run back. One of the photographers left his camera and tripod while running away, which turned out to be his second mistake. The waves quickly pushed over the tripod and his camera landed in the ocean. Although slightly panicked, the man was able to run back into the water and grab his gear before it was taken away.

I can't stress enough how important it is to spend some time evaluating the waves before you go close to the water. This is something that could happen to anyone.

Don't let this happen to your camera!


CHAPTER 5
Without filters

Nikon D800 - Nikkor 16-35mm f/4
ISO50 - f/11 - 2 sec

Long Exposure Photography Without Filters

There are a number of reasons not to spend a lot of money purchasing complete filter sets. Many who have just begun with photography choose to wait and see whether they enjoy the craft before they start investing more money in it and others simply can't afford them at the time. But what if I told you doing Long Exposure Photography is possible without spending lots of money on filters? That couldn't be true, right? Well, it's actually pretty easy.

While we are able to achieve this effect without filters, there is still some equipment you need to have in your inventory. That being said, this gear is also essential for your photography in general, not specifically for this effect. Since I've already dedicated a chapter to this equipment I won't be going into detail about it again.

What you need

- A camera that has the possibility to manually change aperture, ISO and shutter speed.
- A tripod that is sturdy enough to stand still for a longer period of time.
- A remote shutter to remove the chances of vibration when pressing the release button. (This can also be achieved by using the delayed shutter).

Both a camera and tripod are essential in mostly any other part of photography so this is, as I said, not something you need just for long exposures. If you're curious about what other gear I recommend, visit my article Essential Equipment for Landscape Photography.

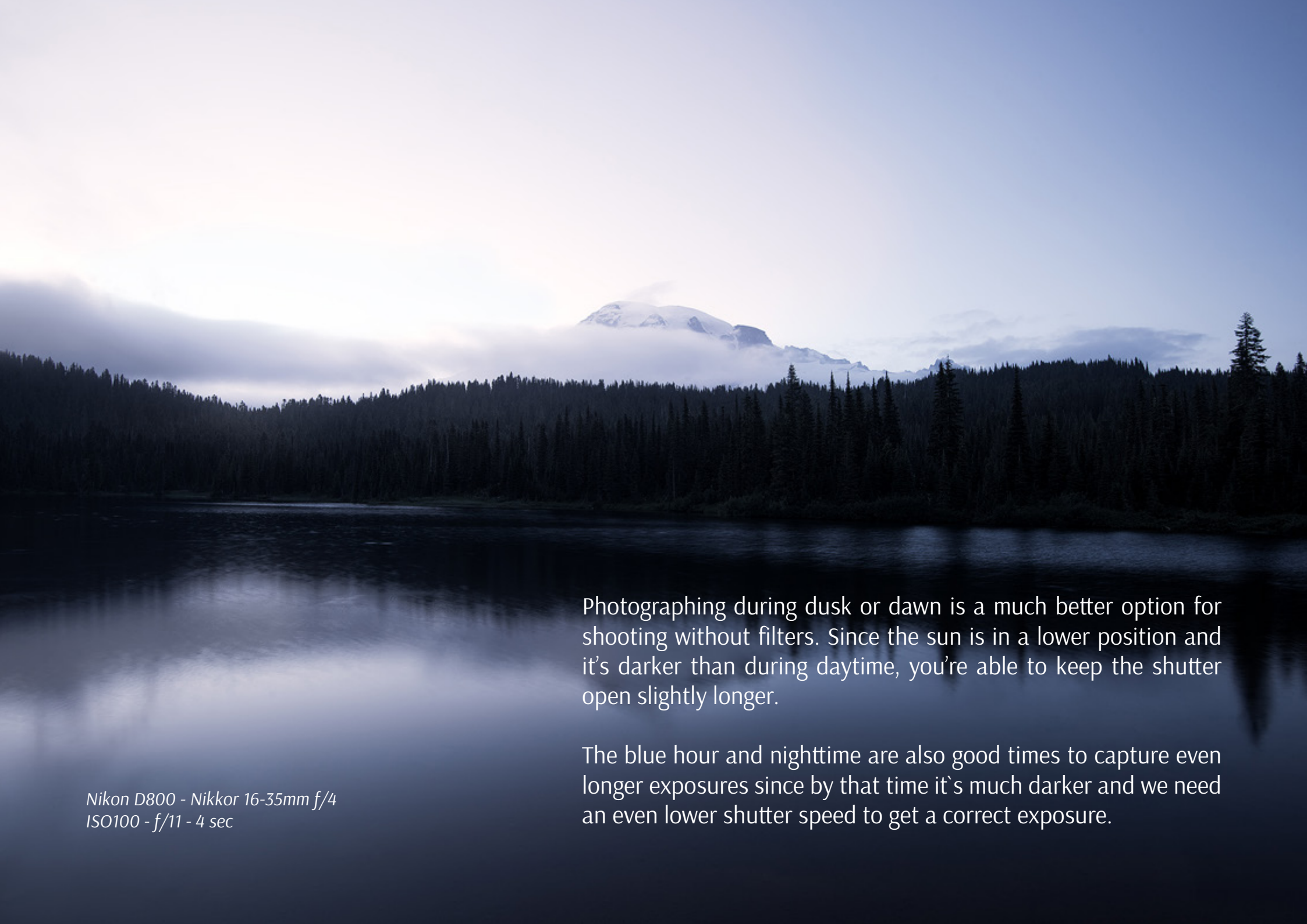
Nikon D810 - Nikkor 14-24mm f/2.8
ISO400 - f/2.8 - 8 sec

Nikon D810 - Nikkor 14-24mm f/2.8
ISO100 - f/11 - 20 sec

Avoid Photographing During Daytime

Since capturing long exposures means keeping the shutter open for seconds, even minutes, light is an extremely important factor when doing it without filters.

It's too bright to get a long exposure when the sun is at its highest, even with the techniques shared below.



Photographing during dusk or dawn is a much better option for shooting without filters. Since the sun is in a lower position and it's darker than during daytime, you're able to keep the shutter open slightly longer.

The blue hour and nighttime are also good times to capture even longer exposures since by that time it`s much darker and we need an even lower shutter speed to get a correct exposure.

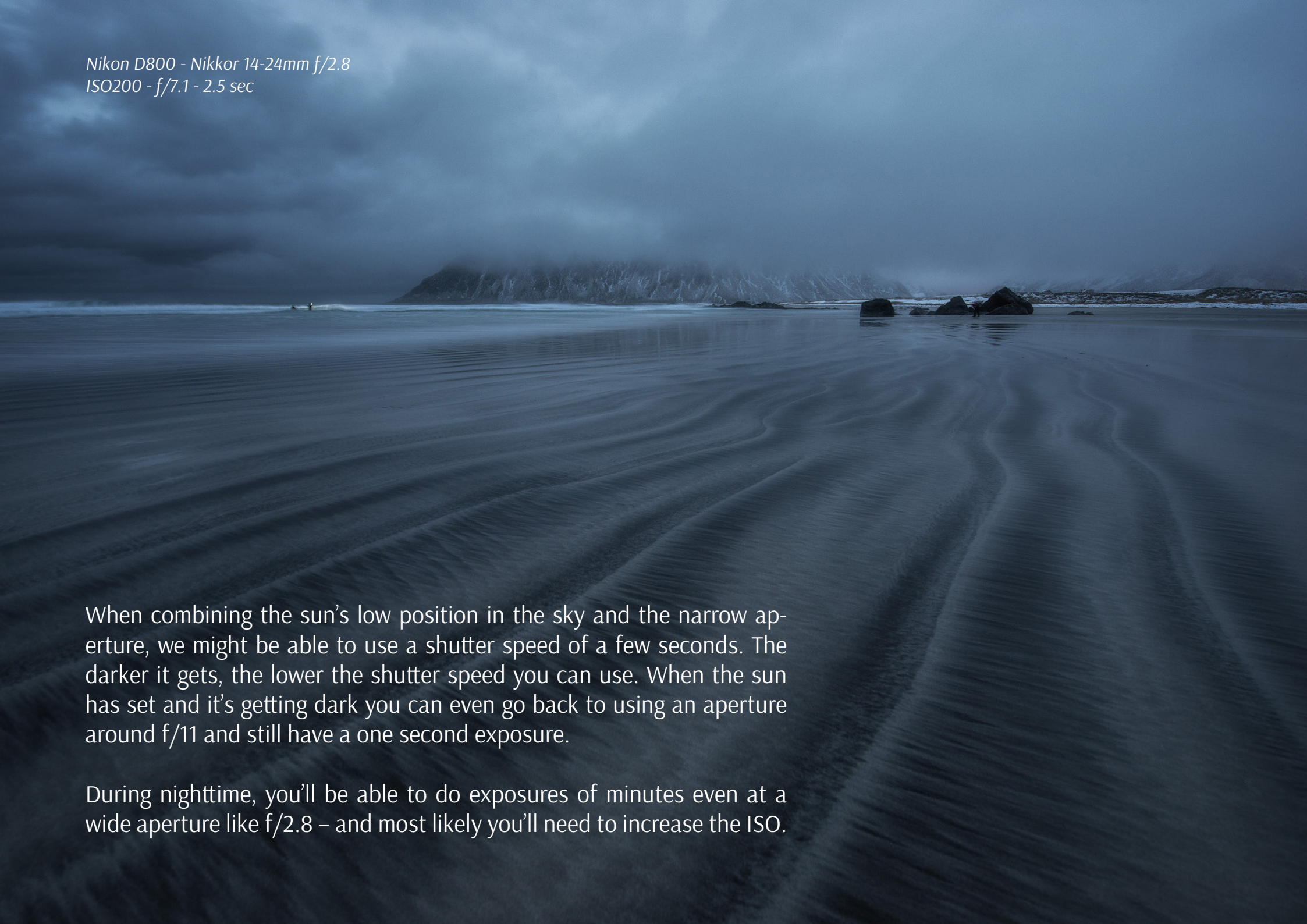
Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 4 sec

Use a Narrow Aperture

The second method to achieve a slower shutter speed is using a narrow aperture. By comparing an aperture of f/7.1 and f/22, we can clearly see a huge difference in the required shutter speed to get a well-exposed image. This is because a narrow aperture such as f/22 only lets through a small amount of light compared to f/7.1, due to its smaller opening.

Using a narrow aperture means that it takes more time for the same amount of light to enter the camera, which allows us to use a slower shutter speed to correctly expose the image.

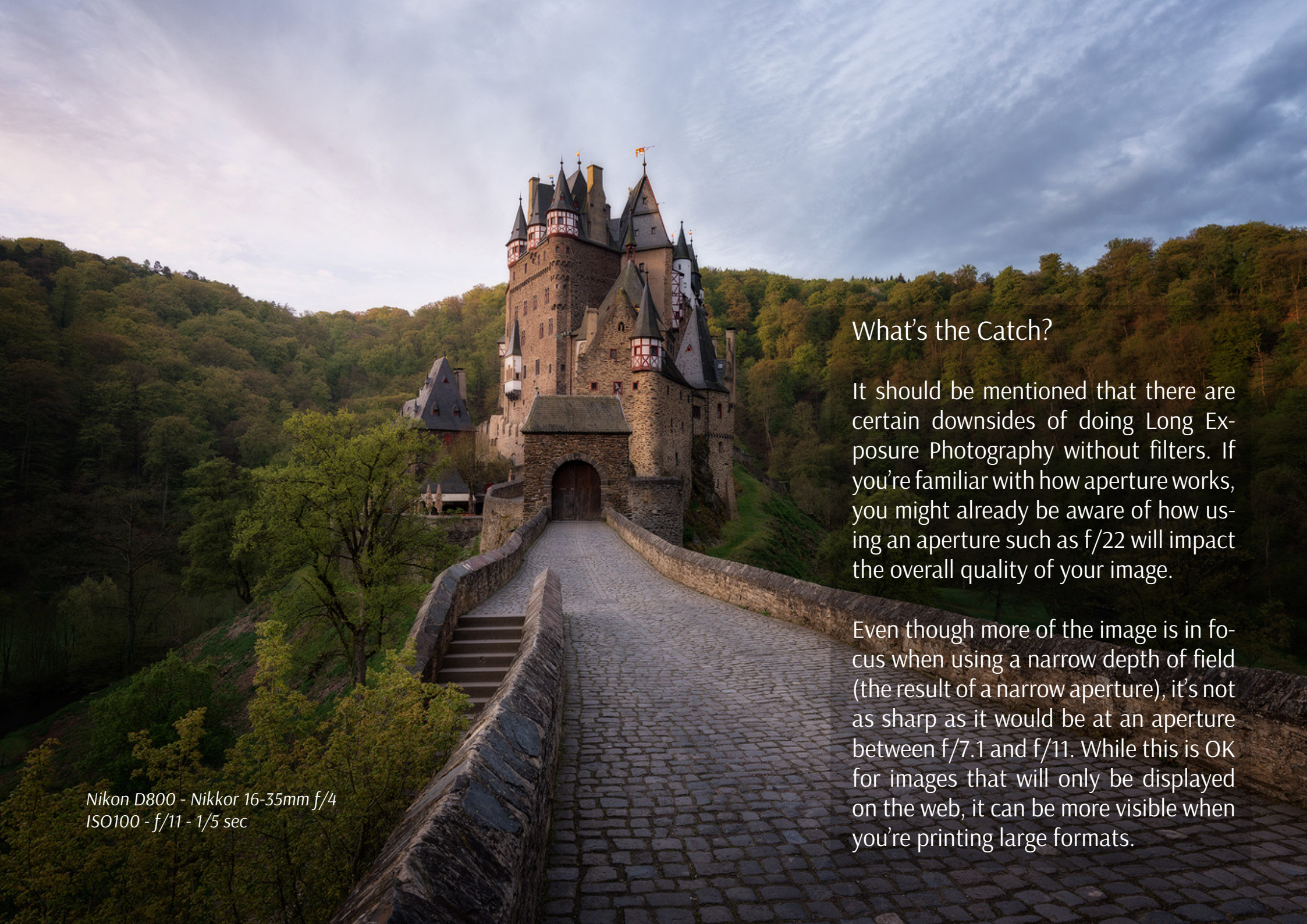
Nikon D800 - Nikkor 16-35mm ƒ/4
ISO100 - ƒ/11 - 1/8 sec



Nikon D800 - Nikkor 14-24mm f/2.8
ISO200 - f/7.1 - 2.5 sec

When combining the sun's low position in the sky and the narrow aperture, we might be able to use a shutter speed of a few seconds. The darker it gets, the lower the shutter speed you can use. When the sun has set and it's getting dark you can even go back to using an aperture around f/11 and still have a one second exposure.

During nighttime, you'll be able to do exposures of minutes even at a wide aperture like f/2.8 – and most likely you'll need to increase the ISO.

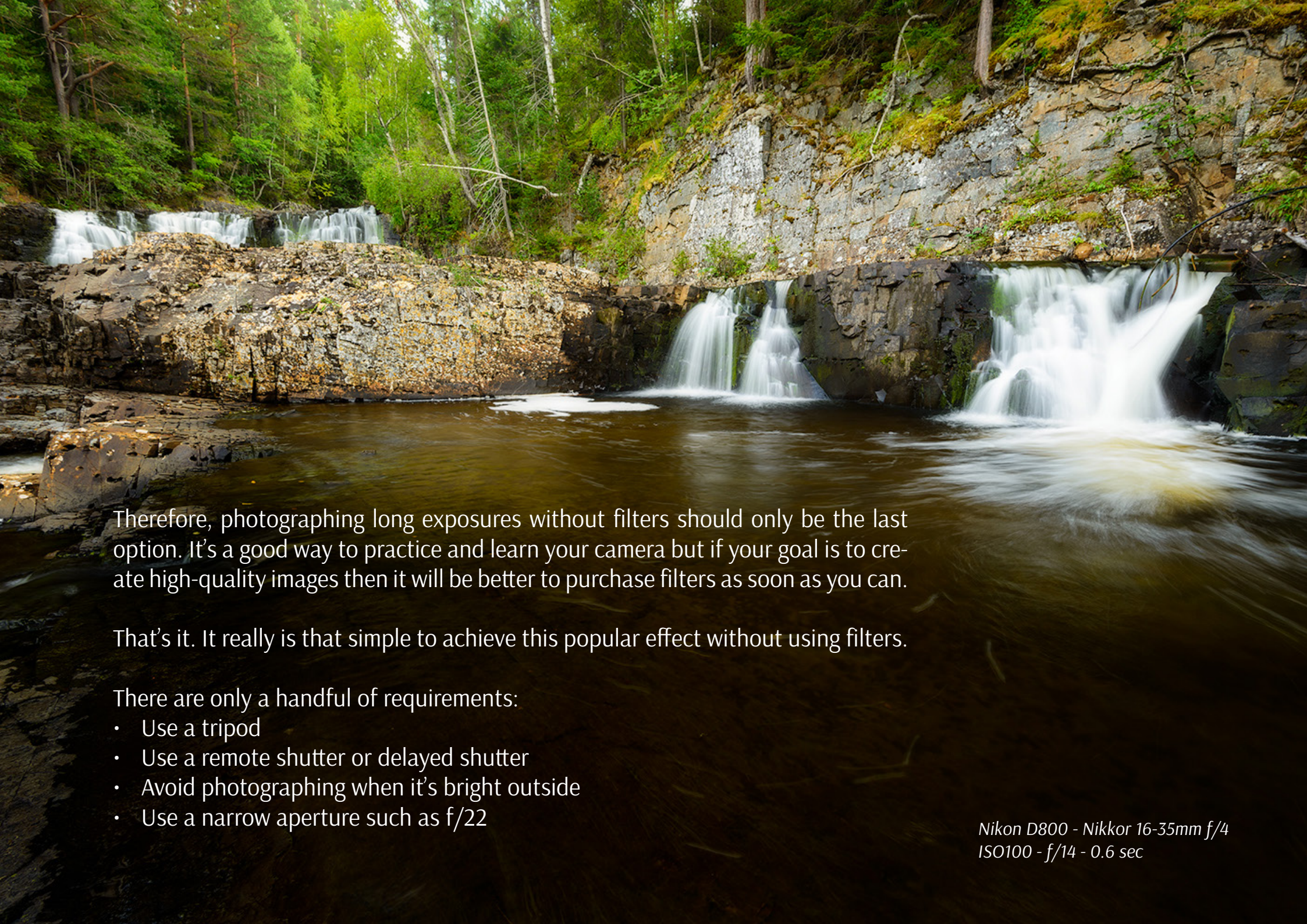


Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/11 - 1/5 sec

What's the Catch?

It should be mentioned that there are certain downsides of doing Long Exposure Photography without filters. If you're familiar with how aperture works, you might already be aware of how using an aperture such as f/22 will impact the overall quality of your image.

Even though more of the image is in focus when using a narrow depth of field (the result of a narrow aperture), it's not as sharp as it would be at an aperture between f/7.1 and f/11. While this is OK for images that will only be displayed on the web, it can be more visible when you're printing large formats.



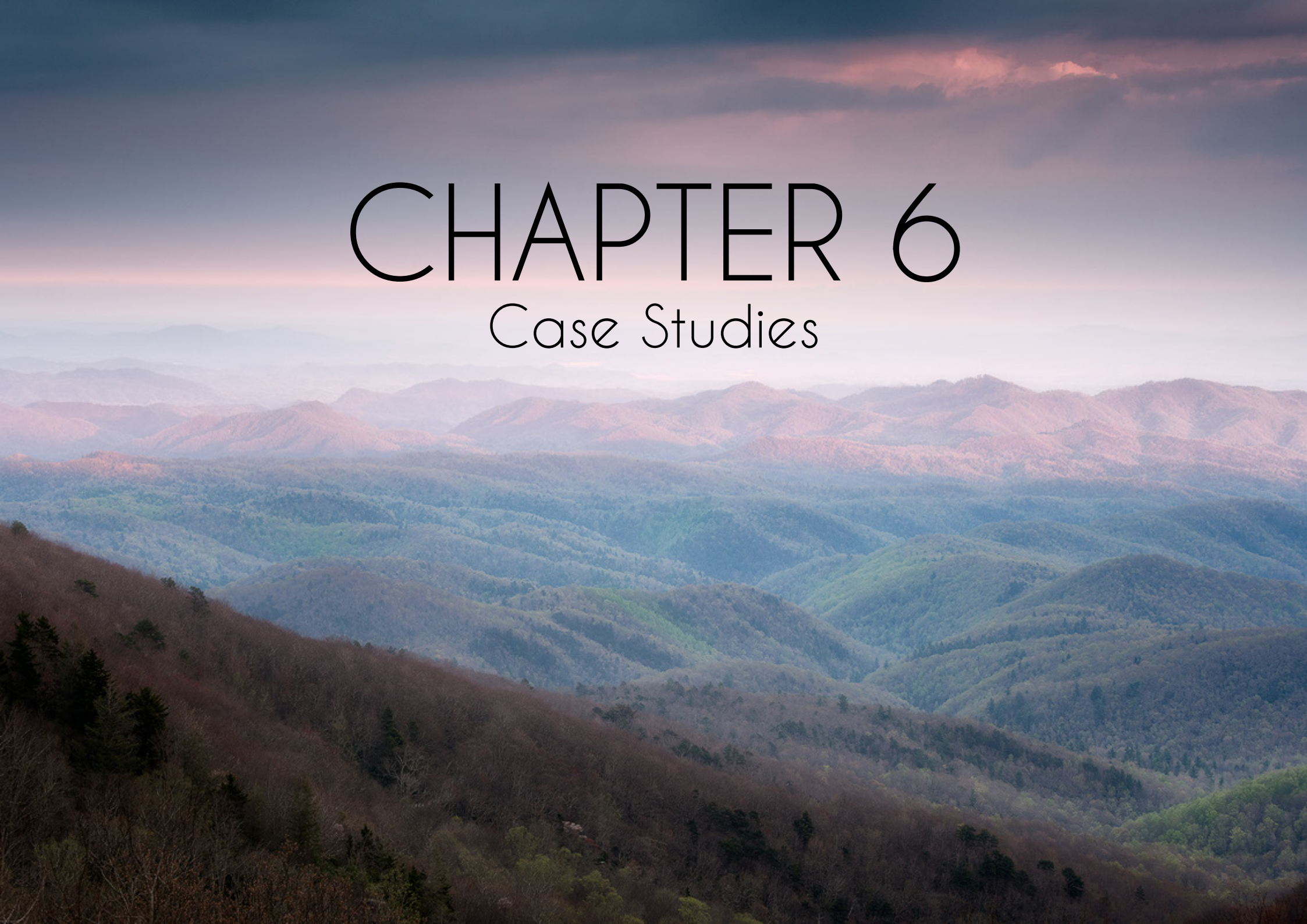
Therefore, photographing long exposures without filters should only be the last option. It's a good way to practice and learn your camera but if your goal is to create high-quality images then it will be better to purchase filters as soon as you can.

That's it. It really is that simple to achieve this popular effect without using filters.

There are only a handful of requirements:

- Use a tripod
- Use a remote shutter or delayed shutter
- Avoid photographing when it's bright outside
- Use a narrow aperture such as f/22

Nikon D800 - Nikkor 16-35mm f/4
ISO100 - f/14 - 0.6 sec



CHAPTER 6

Case Studies

Case Study 1: The Minimalistic Sunrise

The biggest challenge with Long Exposure Photography is knowing which scenarios benefit from a slow shutter speed. Not only do you have to determine whether you should use a slow shutter, you also need to consider how long it should be. 1 second? 5 seconds? 1 minute? More?

While this gets easier with experience, it's always a process figuring out what will work for a specific image. Often, trial and error is the best way to find out. However, we don't always have the time to try different filters and shutter speeds, especially when photographing during sunsets or sunrises as the light changes quickly.

The more you use filters, the more you notice factors such as how quickly the clouds are moving, how much motion there is in the foreground and other types of movements. Use this knowledge and learn how to take advantage of it.

In this case study, we will compare two images that have the exact same composition yet look different due to the choice of shutter speed. We will also look at *why* I chose those exact filters & exposure times.

Iso 100 - f/11 - 181 sec

ISO100 - f/11 - 1/13 sec

ISO100 - f/11 - 90 sec

Despite having the exact same composition, the two images above are nothing alike. I'll leave it up to you to determine which version is better, as that's not relevant in this case. What's important, however, is to understand how big of an impact the shutter speed can have on an image.

This particular sunrise in Trondheim, Norway was one of those rare days when it feels like the light constantly is getting better and you have to ask yourself how long this will keep going.

Even though I enjoyed the nice reflecting waves with a short shutter speed, I knew that a long exposure would flatten the water completely and the image would get a more minimalistic feel.

I also noticed that the clouds were moving relatively fast, meaning that the motion would be visible on an exposure of more than one minute (they did not move fast enough to stand out with an exposure of 30 seconds).

Since the sun was rising quickly, I knew that the light would change quickly and even though the colors would last for a long time, I would need to change my shutter speed for every image as it was getting brighter.

To get an exposure of over 1 minute, I used my NiSi 10 Stop ND Filter and kept my original ISO and aperture.

ISO100 - f/11 - 1.3 sec
Filters used: Singh-Ray Reverse GND

ISO100 - f/11 - 120 sec
Filters used: LEE Little Stopper
& Singh-Ray Reverse GND

Case Study 2: The Tales of a Waterfall

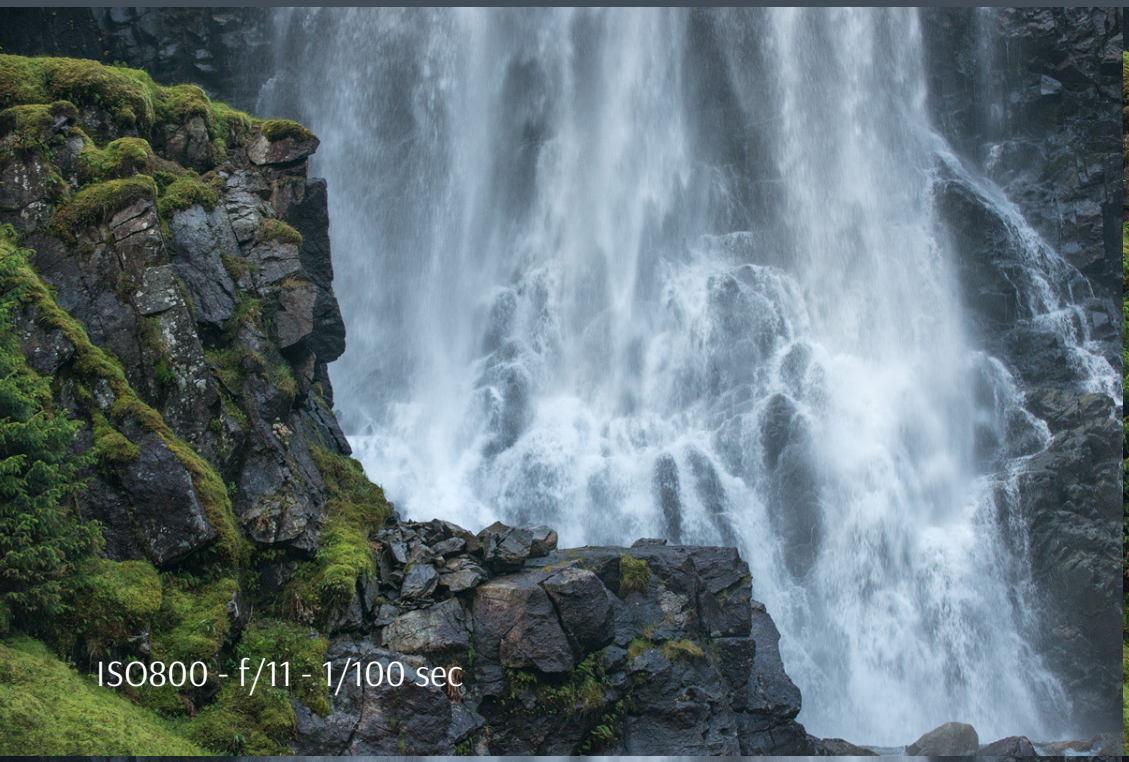
The choice of shutter speed will have a huge impact on the image, as you should know by now. This is especially visible on images of waterfalls.

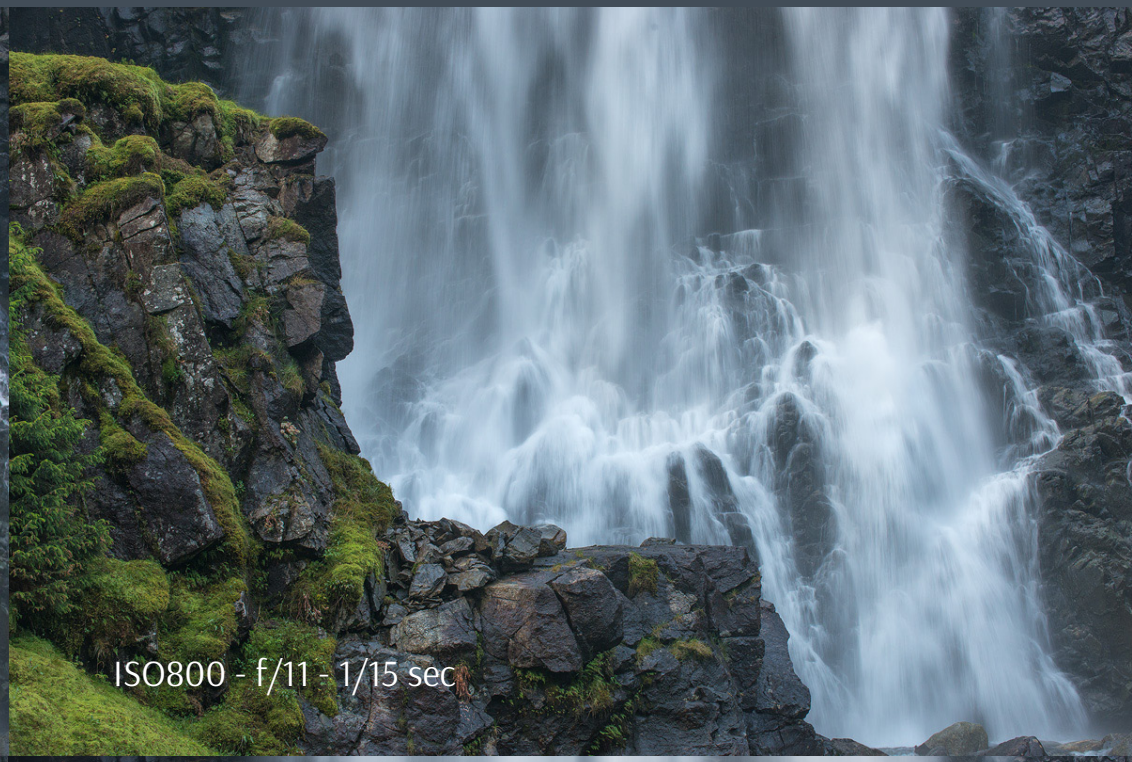
Since the water is flowing in a high tempo, you don't need a long exposure to capture the motion. That means that we're often working with "short long exposures" when photographing waterfalls (even though you can get amazing images of waterfalls with shutter speeds of 30+ seconds).

Remember that the slower things are moving, the slower the shutter speed needs to be for the camera to register the movement.

I'm always fascinated by how much the story changes by only extending the exposure time for a fraction of a second. The images shown to the left might be similar but they tell two completely different stories.

Again, there's no *better picture* of the two and it all depends on the preferences of the photographer. My goal is merely to make you aware of the possibilities.


ISO800 - f/11 - 1/100 sec


ISO800 - f/11 - 1/15 sec


ISO400 - f/11 - 1/30sec


ISO100 - f/11 - 1/3sec

Notice that the longer the exposure time is, the less structure remains in the water. Keep this in mind when you're photographing a waterfall. What do you want to convey?

If you wish to emphasize the raw power, a faster shutter speed is ideal. By using a slower speed, you're transforming the scene into something more dream-like.

The image to the right is from the well-known Skogafoss in Iceland, a massive waterfall known for its raw power. So, why didn't I use a short shutter speed?

As I've mentioned before, I believe that rules are great guidelines but they shouldn't be followed strictly. Even though the Skogafoss waterfall is massive, the gloomy weather and dark mood showed better by using a longer exposure.

Still, the shutter speed is relatively short compared to many other images throughout this guide but, again, the faster the movement is, the shorter the exposure needed to capture it. Since the water was falling quickly, a shutter speed of 5 seconds was more than enough to get the silk-like effect.

ISO100 - f/11 - 5 sec
Filters used: LEE 0.6ND


ISO100 - f/11 - 1/10 sec
Filters used: None
ISO100 - f/11 - 105 sec
Filters used: NiSi 10 Stop ND

Bonus Tip: Cover the Viewfinder

Remember to cover the viewfinder when using long exposure times. Some cameras have a built-in function for this. If your camera doesn't, take a small piece of cardboard and place it in front of the viewfinder. This is done to prevent light from entering through the viewfinder and making what's called a light leak.

The image below shows what might happen when you forget to cover the viewfinder. Don't worry, it's not dangerous for the camera but it will ruin the image!

Nikon D800 - Nikkor 70-200mm ƒ/2.8
ISO100 - ƒ/10 - 60 sec

About the Author

I'm Christian Hoiberg, a Norwegian Landscape & Travel Photographer. Combining my lust for travel and love of photography, I visit both known and unknown destinations around our beautiful planet. Nature and photography are how I disconnect and being able to share the beauty around us is what I thrive on.

My passion for photography started at the age of 15 when I bought my first DSLR camera after working at an electronics retailer. Just like most people, I began photography without having an understanding of the camera and happily used the "automatic" settings. For years, I took pictures just for fun but eventually I felt the urge to improve and understand how to properly use the camera. After learning it, my passion grew even bigger and I realised that this is what I want to do with my life.

Since then I've been featured in several magazines, worked with major companies and shared my knowledge with thousands through my platform Capture-Landscapes.

Special Notes

I want to direct a huge thank you to the following for their contribution to this book:

Mel Jamey for her excellent help correcting my grammatical mistakes in this book and the CaptureLandscapes articles. It's an honor to have you on the team, Mel!

Mila Malenova for sharing her graphic expertise and optimizing the layout and graphics of this eBook.

Steven Henriksen for letting me use his behind-the-scenes image of yours truly (page 14).