

The Fish-eye Lens In Landscape Photography

by
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The fish-eye lens has long been a novelty lens that allows photographers to explore a unique look and perspective in their photographic endeavors. Invented over 100 years ago, it is defined as an ultra-wide angle lens that has a 180 degree angle of view and produces a hemispherical view rather than the linear view that normal recti-linear design lenses have. Their first serious use was in the early 1900's to study full-sky views in meteorology. In the mid 1900's, some started experimenting with these lenses in regular photography. Today we have two primary types of fish-eye lenses. The circular fisheye takes in a true 180 degree field of view and therefore produces a circular image. The full frame fish-eye has a 180 degree field of view diagonally from corner to corner and produces a frame filling image but with heavy linear distortion.

Below is an example of a circular fish-eye image:



Dymond Lake Eco Lodge, Manitoba, Canada (Canon EOS 1D Mark IIIn, Sigma 8mm circular fish-eye)

This image was taken through a square window with the lens only a couple of inches from the glass. The lens took in the entire 180 degrees and you can see how it nearly bent the square window into a circle. It was -40 degrees outside when I took this photo in a howling wind so indoor fun with fish-eyes was the order of the day.

This is a full frame fish-eye image:



Kulima Cove, Oahu, Hawaii (Nikon D800E, Sigma 15mm full frame fish-eye)

The above photo takes in 180 degrees from one corner to the diagonally opposite corner. It bends all straight lines that aren't through the precise center of the image towards the closest edge. Anything off-center above the center will get pushed upward in a convex manner while anything below the centerline will get pushed downward in a concave manner. Similarly, any vertical line left of center will be pushed out like a bow to the left and any vertical line to the right of center will be pushed out to the right. In the above shot, the horizon was above the center line so the image has a curvature to it that makes it seem like you are photographing the curvature of the Earth. The farther off center any straight line is in the frame, the more distorted it becomes. This allows one to take in a really wide angle of view. In most cases, in landscape photography, bending the horizon upwards is more aesthetically pleasing than bending it downwards; however, there are times when bending it downwards is to your advantage. In the photo below, the horizon was placed well below center resulting in an extreme bending of the water/sky interface. This was taken in an area near the photo above and, as you can see, photographically it is much less interesting unless the clouds are really what the focus of your photo is as it was back in the early days of fish-eye photography:



Turtle Bay, Oahu Hawaii (Nikon D800E, Sigma 15mm full frame fish-eye)

If the horizon is placed in the center of the image, it will remain straight but the verticals will still bend like a bow to the left and right of center. Any vertical line through the center will remain straight while anything left or right of center will bend. We will explore a photograph with these traits later in the article. If the lens is pointed straight up or straight down, anything from the camera's plane upward or downward will be in the frame.

Before we get into the creative use of fish-eye lenses in landscape photography, let's cover the equipment and techniques that you will need to add non-linear ultra-wide angle photography to your repertoire. This is not a genre of photography that will appeal to everyone but for some, it opens up new creative avenues. If you are photographing with 135 format full frame cameras, circular fish-eye lenses are usually around 8mm. They are made by a number of lens manufacturers including Sigma and Samyang/Rokinon. APS-C circular fish-eye lenses are usually in the 4 to 5mm range. More useful to the landscape photographer, and the focus of the rest of this article, is the full-frame fish-eye. These lenses are typically 14-16mm for full frame cameras and 10mm for APS-C cameras. Most manufacturers include a full-frame fish-eye in their lens lineup but you may have to go to a third party lens for a circular fish-eye. Canon and Nikon make a very special fish-eye lens that acts as both a circular and a full frame fish-eye on full frame cameras. The 8-15mm f/4L fish-eye zoom lens allows both types of photography and anything in between circular and full-frame fish-eye angles of view in a single lens.

Depth of field on all fish-eye lenses is nearly infinite even at moderate apertures such as f/5.6 or f/8. With any fish-eye lens in most landscape applications, simply setting the lens to infinity or

focused slightly closer than infinity will give you sharp results from near to far. Only if you are working close to the ground are careful hyperfocal settings necessary. You almost have to try to take an out of focus shot with a fish-eye lens. Due to the extreme wide angle of view, it is very easy for a tripod leg to slip into the frame. Great care must be taken to avoid this. Since these lenses can be shot at wider apertures and still have very large depth of field, often hand holding is the solution but one must be careful to not get their own feet into the shot and extreme care must be taken to avoid your own shadow.

Let's explore some photographs taken with a Sigma 15mm f/2.8 full frame fish-eye lens on various full frame camera bodies:

Creative Image #1: Chinaman's Hat With Bending Palm Trees



Chinaman's Hat at Kualoa, Oahu (Nikon D800E, Sigma 15mm full frame fish-eye)

I was commissioned to come up with a large photo to hang on a wall that features lots of water and palm trees hanging out over the edge of the water and it was to be printed on watercolor media. On a Hawaii trip, I tried to get that shot but all of the most scenic areas tended to have the palm trees bending away from the water or straight up due to the prevailing winds coming off of the water. After unsuccessfully searching for the appropriate spot for a couple of days, I decided that I would use the fish-eye lens to help me out. I had noticed a nice beach with Chinaman's hat in the distance and a line of palm trees just off of a roadside in a county park but the trees did not bend over the water. By using the fish-eye lens which bends vertical lines like a bow and placing the horizon in the center of the frame, I was able to create the illusion of

the trees bending out over the water while not bending the horizon. A small crop off the bottom created a slightly panoramic image with the horizon not quite in the middle which helped the photo compositionally. This is a case where a fish-eye lens was used to create a photo that does not look like any kind of "special effects" lens was used. The client was thrilled with the final framed version which is now proudly displays a large watercolor print in her home.

Creative Image #2: Horseshoe Bend



Horseshoe Bend with Hiker, Arizona (Sony a7R, Sigma 15mm full frame fish-eye, Novoflex adapter)

While leading an Arizona Navajo Country photo workshop, I went to my favorite shooting spot at Horseshoe Bend - a small notch that requires a bit of intestinal fortitude to climb into due to the 1000 foot drop and loose rocky material in this slot. While I usually try to avoid people in my landscape photos, I thought the lone hiker standing atop the cliffs would add a nice element to the photograph but even a 15mm regular recti-linear wide angle lens wouldn't be wide enough to capture all of the river bend with the cliffs and hiker. However, a full frame fish-eye, which takes in 180 degrees diagonally, was plenty wide to achieve the effect I was demonstrating to the workshop participants. I mounted my Nikon F-mount Sigma 15mm fish-eye lens with the Novoflex Nikon to Sony E-mount adapter to my Sony a7RII camera and took this photo. Due to the near infinite depth of field, at f/8 I was able to keep the near cliff wall on the left, which was only about 3 feet from my position, in focus while also keeping everything out to the horizon sharp.

Creative Image #3: Straight Up Aspens



Aspen Grove, Coconino National Forest, Arizona (Nikon D810, Sigma 15mm full frame fish-eye)

The Coconino National Forest north of Flagstaff, Arizona provides some of the best Aspen photography in the Southwest in mid October. Most Autumns I am able to make a day trip up to this area. I had pre-visualized a photo looking straight up in an Aspen grove where the trees were relatively symmetrical. I was fortunate to find such a spot early in the day just after the sun had come up and was only lighting the tops of the trees. This shot was taken hand held at $f/7.1$ while pointing the camera straight up. This tends to be a good aperture value for most high megapixel full frame sensor cameras due to a good balance between shooting the lens in its sharpest regime while not entering too deeply into the realm of resolution robbing diffraction. Had I set the camera on the ground, I would get too much ground clutter in the corners due to the 180 degree angle of view from corner to corner. Instead I chose to stand up, thereby eliminating such issues. By placing the opening in the trees directly above my position in the center of the image and holding the camera as level as possible, I was able to create an image where all of the tree trunks are straight (except for any natural bend) and having the trees all come to a nicely lit center of focus. This is exactly the image I was envisioning! Even if I had only gotten this image for the entire day trip, I would have accomplished my goal and been happy. However after I got this image, I set out for another shot...

Creative Image #4: Bending Light Through Aspens

After taking the Straight Up Aspens shot a glimmer of light blinded my left eye. It was the sun poking through the trees. I immediately saw this as an opportunity to combine the upward angle of the Aspens with a starburst from the sun. As I was angling around trying to come up with an interesting shot, I noticed the diagonal symmetry possible between the sun itself and the opening in the trees directly overhead. By stopping down the lens to f/16 the aperture diaphragm of a 15mm lens is only 0.94mm wide which leads to a lot of bending of light at the aperture blade overlap edges. This diffraction will cause bright points of light to explode in a starburst pattern without using any filters to create the starburst by using the physics of light to our advantage. Ultra-wide lenses like a fisheye and especially those not made with curved aperture blades can create beautiful starbursts. This is a situation where the horizon will bend down in the center since



Aspen Grove, Coconino National Forest, Arizona (Nikon D810, Sigma 15mm full frame fish-eye)

the lens is being pointed up and the horizon is well below the center. It also illustrates how a fish-eye lens bends vertical lines. The tree near the center is relatively straight but trees bend in an increasing fashion the farther they get from the vertical centerline of the image.

While I realize the result is not everybody's "cup of tea", I am thrilled with this shot due to the balance created between the starburst and the circular opening in the tree canopy. This is something that simply would not have been possible with any other type of lens.

In summary, for those wanting to introduce a new wrinkle into their landscape photography, give a fish-eye lens a try. It's ability to distort vertical lines is not conducive to all or even many scenes but when you find one that it does work with, it can create very interesting photographs.

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A handwritten signature in black ink that reads "E.J. Peiker". The signature is stylized and cursive.

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