Linear Raw Profiles

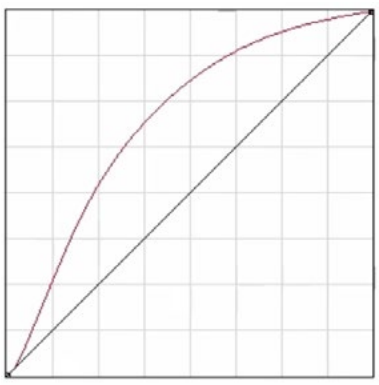
Linear Raw Profiles

In this lesson, we're going to dive into Linear Raw Profiles. When you open a RAW file in Camera Raw or Lightroom, a lot of things happen behind the scenes that are not revealed to you. When an image is opened, it is automatically brightened and contrast is added to the dark portion of the image. This is fine if a large portion of the image is dark. However, if the image contains a lot of bright information or if you have issues with the bright part of the picture, this initial adjustment (in the form of a tone curve) will not be helping your image. There is a way that we can trick Lightroom or Camera Raw into NOT applying this curve that is otherwise always applied. We do that by creating a linear profile. A linear profile will tell Lightroom (or ACR) to not apply this curve. Here, you're going to learn how linear profiles work, how you can create them and when might you want to use them.

How Linear Profiles Work (Timestamp 1:35)

When an image is opened in Lightroom or Camera Raw, its tone curve is adjusted automatically, by default. Let's look at the curve chart. In a standard curve chart, black is represented on the left side and white is represented on the right side. All of the shades of gray can be found in between. The diagonal curve line shows how much light is needed to create those various shades of gray. On the left side, the line is positioned at the very bottom of the chart. This is because it takes no light to create black. As you move to the right, the line gets higher and higher, creating the lighter shades of gray. On the right side of the chart, the line is at the very top because it takes the maximum amount of light to create white.

This straight line is what the curve looks like when no changes have been made to the picture. When an image is opened in Lightroom or Camera Raw, the line will be automatically moved to create an upward curve, adding light and contrast to the image. (See screen shot)



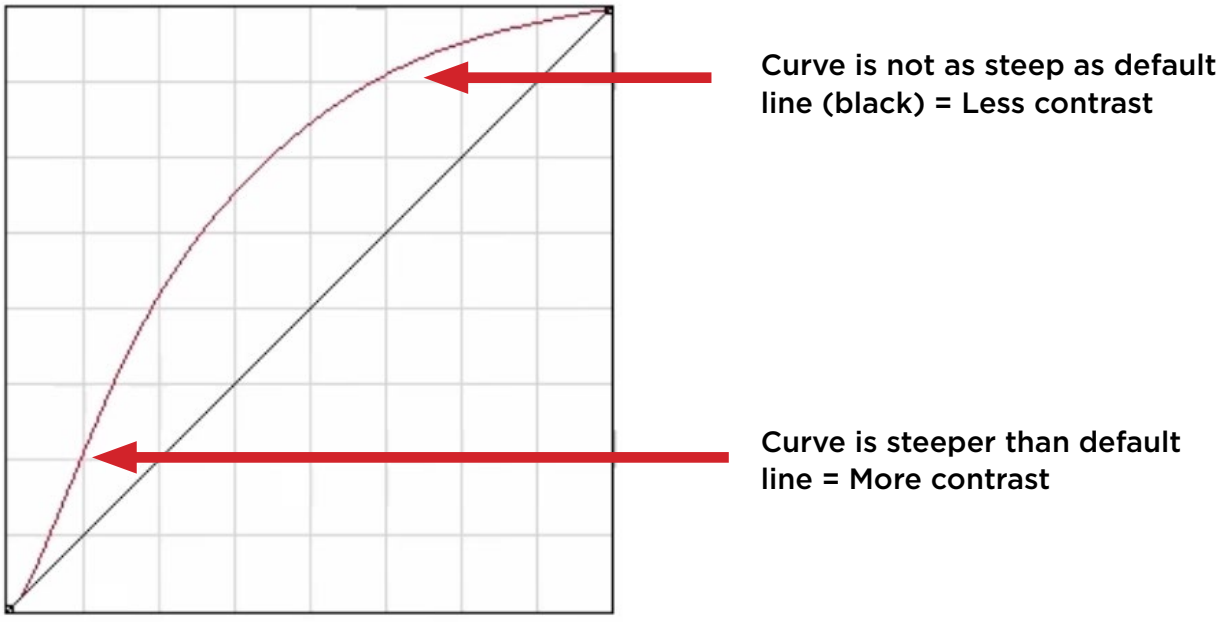
BLACK LINE: The default position of the curve.

RED LINE: The automatic adjustment made to every raw image

If you compare the original curve line to a series of dimmer switches, the dimmer switch would be originally positioned wherever that diagonal line is. If you were to move the line up, you would brighten the image by adding more light. The farther up you move the line, the greater change you'll be making to the image.

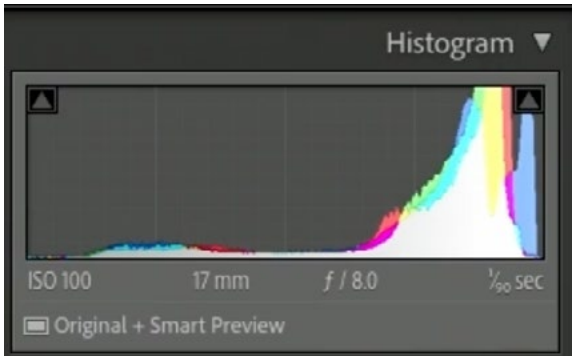
When part of the line is moved up, the left and right points will be anchored in place. That's why the line turns into a curve. In the areas where the curve line is farthest from the original straight line, the image will be receiving the largest change. There will be less of a change in the areas where the line is closer to its original position.

Contrast The term contrast refers to how big of a difference there is between the various shades in the picture. After adjusting a curve line, the steeper parts of the curve (closer to vertical) are where more contrast is being added to the image. The steeper the curve, the more contrast is being applied. Looking at the curve that Lightroom and Camera Raw automatically apply to the picture, you can see that the curve is steeper on the left side, which represents the darker areas. This means that more contrast is being added to the darker parts of the picture. The right side of the curve is not as steep as its original diagonal position. That means the contrast will be decreased in the bright areas.

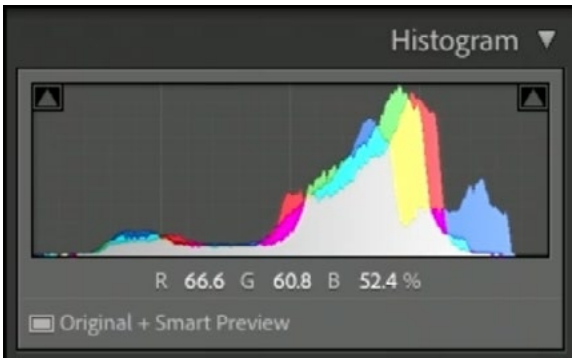


I do not believe that this automatic curve adjustment (that is applied to every image) is always helpful. I find that it can actually be detrimental to images that have a lot of bright areas. If you look at the histogram for an image and find that most of the histogram bars are located on the right side of the chart, it means that most of the image is bright and that this automatic adjustment is probably not being useful.

NOTE: If there is a tall spike on the far right side of the histogram, it means that there are areas in the image that are solid white. Changing the profile to linear will have less of an effect on these areas. It will, however, improve the look of the content directly surrounding the solid white areas.



The default curve adjustment was made to this image, which contains a lot of bright areas.



A linear profile was applied to the image, removing that default adjustment.

LEFT: The default curve adjustment was made to this image. RIGHT: A linear profile was applied. This improves most of the bright areas, with the exception of the areas that were blown out to white. Those areas are represented by the spike on the right side of the histogram.

A linear profile is named as such because the curve line is never moved. It remains in that default, straight diagonal line. When the line is moved, it creates a curve and is therefore no longer "linear."

After opening an image in Lightroom or Camera Raw, you can change to a linear profile by clicking on the Profile menu (in the Basic Panel) and clicking on the Profile menu. Here, one of the options will be Linear *camera name*. If you apply this to overly bright images, it will likely give you a better starting point for making adjustments. For that reason, it's best to change the profile right after opening the image. If you changed the profile after making some adjustments, it could change the image such that you'd need to update those adjustments.

After you have created a linear profile, it will appear in the Profile menu within the Basic Panel.

Linear profiles for darker images The linear profile should not be strictly limited to images that are mostly bright. There may be instances where you have an image that is mostly dark, but it's the smaller bright areas that are really causing a problem. The Golden Gate Bridge image is a good example. It was shot at night, so most of the image is dark, but the bright lights on the surface of the bridge are too bright and are therefore losing detail. When we switch to a linear profile, those bright areas look much better. You will of course need to continue making adjustments to compensate for the dulling effect the profile may have had.

LEFT: Before the linear profile was applied. RIGHT: After the linear profile was applied.

Linear profiles for older files I mentioned that it's a good idea to change the profile immediately after opening the image. That IS ideal, but what if you want to rework an older file that you had already adjusted in the past? You can absolutely change the profile on an image that you already worked on. In fact, I will often times open older files and look for new ways to optimize them. The linear profile setting may be just what the image needs if the bright areas are so bright that they're losing detail. Just know that you will likely need to re-adjust the other tonal sliders as well in order to compensate for the change.

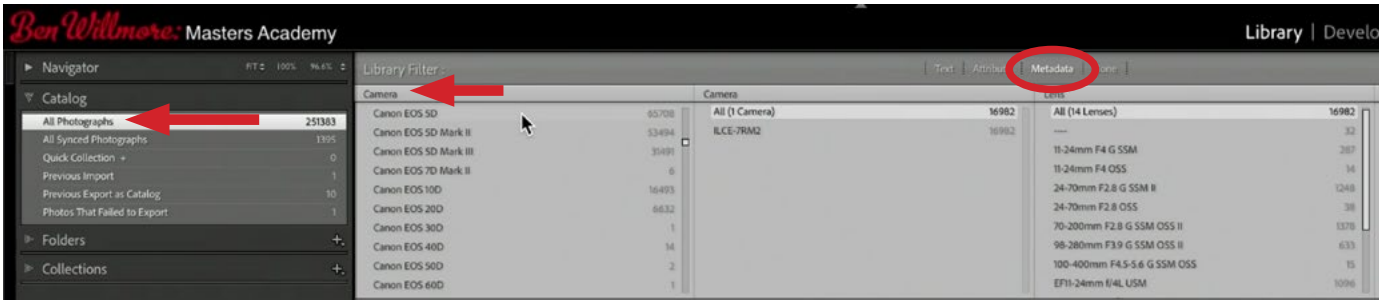
Here you can see an older image that I revisited. A linear profile was applied to the version on the right and you can see that it brought more detail into that bright flower petal.

How to Make a Linear Profile (13:37)

DNG Profile Editor In order to create a linear profile, you will need to down load the DNG Profile Editor utility. This is a free utility from Adobe, and you can download it here: https://helpx.adobe.com/camera-raw/digital-negative.html

You will need to feed the utility a DNG file that was produced from the model of camera you plan on using.

Filter to find cameras used in catalog If you use multiple cameras, you will need a separate profile for each camera. You can see what cameras were used to generate all of your images by using the Filter Bar in Lightroom's Library Module. In the Library Module, expand the Catalog Panel on the left side of the screen and click on the "All Photographs" option. This will display a thumbnail list of every single image in your catalog. You can filter these images by expanding the Filter Bar above the main image window. Select the Metadata filter option and then set the left-most menu to Camera. This will show a list of all the cameras used to create the images in your catalog.

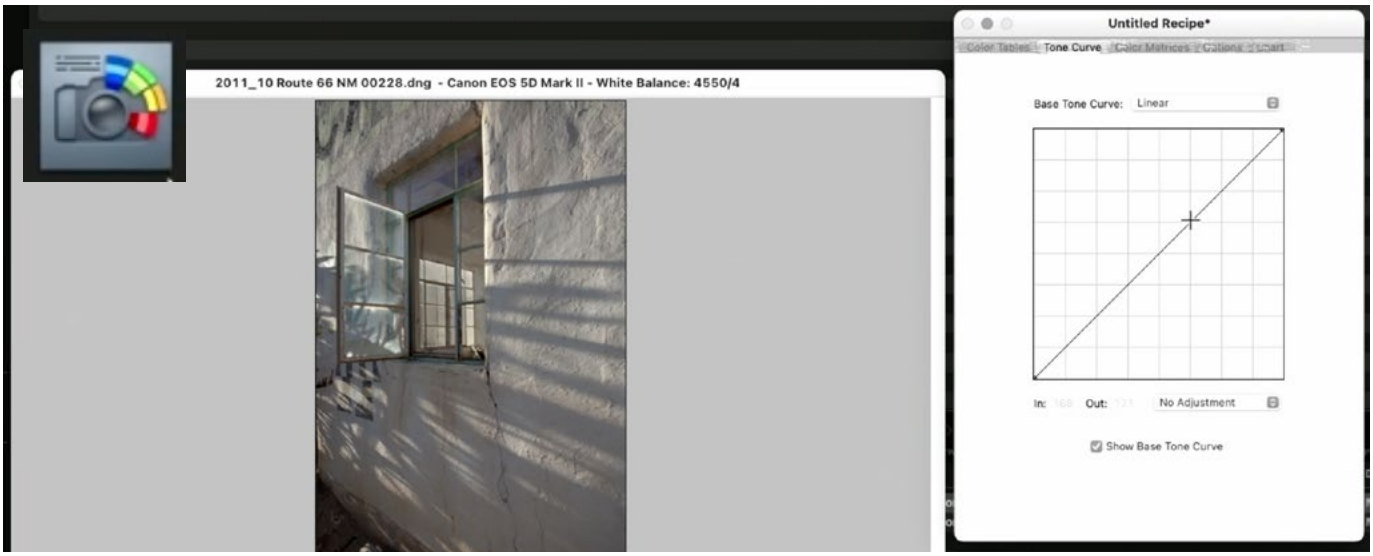


In the Library Module, the Catalog is set to show All Photographs. We chose to filter by Metadata and then set the left menu to Camera. This shows all of the cameras that were used in the current catalog.

Prepare RAW file for DNG utility You'll need to find a RAW file for each of the cameras you'd like to create a profile for. Activate a RAW file (a JPEG won't work) and open it in Lightroom's Develop Module. If the image has been previously adjusted, set it back to default settings by clicking the Reset button in the bottom right corner. Then expand the Basic Panel and make sure that the Profile menu is set to Adobe Standard. The file is now prepared to be sent over to the utility to create a linear profile.

The image needs to be exported out of Lightroom as a DNG file. To do this, click on the File menu and choose Export with Preset > Export to DNG. Save the file in a place that you'll remember.

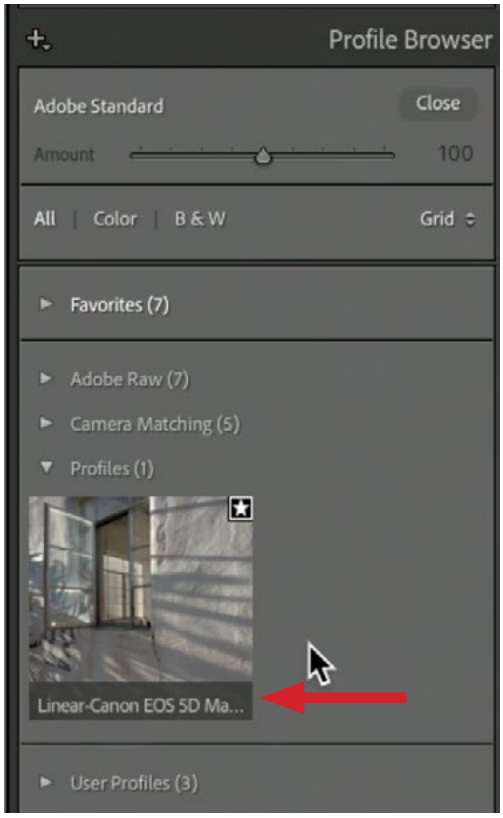
Open the DNG Profile Editor Utility, click on the File menu and choose Open DNG Image. You'll be prompted to navigate to the DNG file that you just saved. Click Open and the image will appear alongside a settings dialog. This dialog remembers any settings that were previously used, so I always make a habit of first clicking on the Edit menu and choosing to Clear All Adjustments. This just ensures that you're starting with default settings.



In the DNG Profile Editor, the dng file is open and the Base Tone Curve menu is set to Linear.

In the settings dialog, activate the Tone Curve tab and set the Base Tone Curve menu to Linear. This will ensure that no curve adjustment is applied to the image when it's opened. Next, click on the Options tab and type "Linear Profile" or "Linear Curve" into the Profile Name text field. Now you can click on the File menu and choose Export. The Export dialog will open and it will have already navigated to the appropriate location on your hard drive. Make sure that you save the profile in this location. It will have added the name of your camera to the file name, which is what you want. Click the Save button. You can now close the image file and repeat the process with DNG images from any additional cameras from your catalog. Now that you've saved your linear profiles, you will need to restart Lightroom in order for them to appear in the Profile menu.

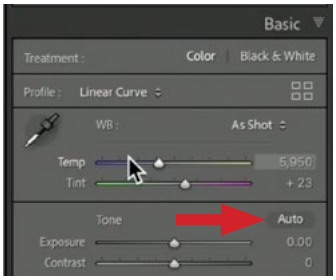
Apply a profile Open an image in the Develop Module and expand the Basic Panel. The Profile setting appears at the top of the panel. Expand the Profile Browser by clicking on the icon to the right of the profile menu or by clicking on the Profile menu and choosing Browse. Inside the Profile Browser, the profiles you saved will be located in the category that's simply called "Profiles." Note that these profiles are camera-specific, so you will only see the profile[s] that were created for the specific camera that was used to shoot the active image. Click the profile thumbnail to apply it to your image. If you click the little star icon in the corner of the profile thumbnail, it will add it to the favorites list so that it appears inside the Profile menu at the top of the Basic Panel.



How to Implement Profiles & Optimize Images (24:54)

Now that you know how to create and apply a linear profile, let's take things a step further and learn how to use them to best optimize your images. Right after a linear profile is applied, the image will likely look a bit dull. That's ok, because it's really just designed to serve as a good starting point. You'll need to make further adjustments to add pop and optimize the image.

Auto adjust There is an Auto button inside the Tone category of sliders within the Basic Panel. When you click this button, Lightroom (or Camera Raw) will evaluate the image and adjust the total sliders automatically. This is always an option, but know that this can commonly result in blown out highlights. That's because it doesn't know that a linear profile has been applied. If you choose to use the Auto setting (and it will vary from image to image), keep in mind that you may need to then lower the Highlights slider in order to compensate for those bright highlights.

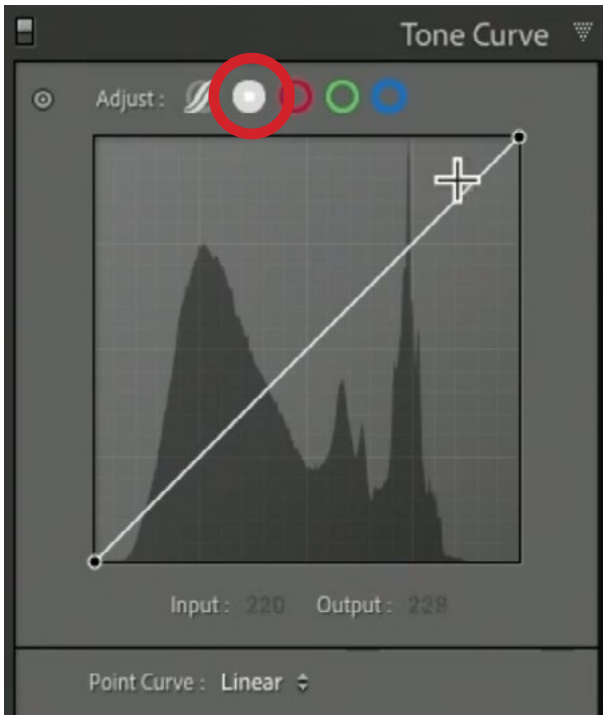


The version on the right has a linear profile applied and you can see that the image looks dull.

The Tone Curve The Tone Curve Panel is located directly below the Basic Panel and it's a great option for adjusting an image with a linear profile applied. Inside the Tone Curve Panel, some curve options appear above the chart. I like to use the second option, which is the point curve. This curve allows you to add points and manually move them in order to adjust the tones in the image.

A linear profile can make an image look dull because it's lacking contrast in many areas. A curves adjustment can be used to add contrast back in. To add contrast, you can make the dark areas darker, you could make the bright areas brighter, or both.

In the example image, there are snowy mountains in the distance that look quite dull and could use more contrast. The bright areas are already quite bright, so we'll add contrast by making the dark areas darker.

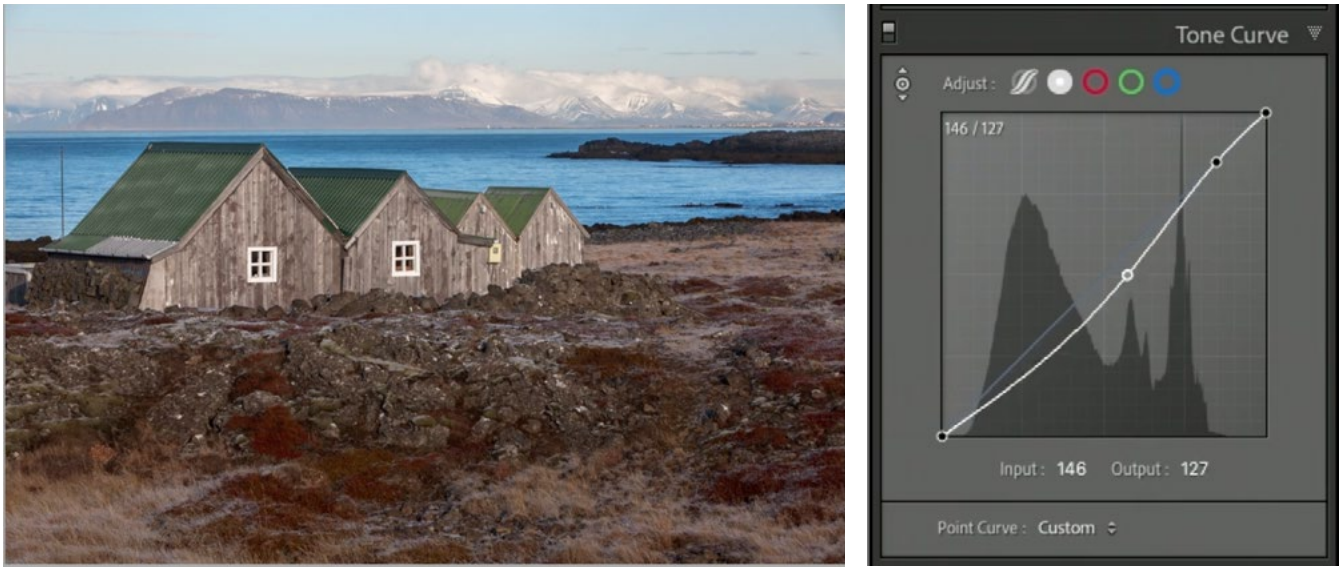


The Tone Curve Panel. The point curve option (circled) is active.

With the point curve active, activate the Targeted Adjustment Tool , which appears in the top left corner of the panel. This tool allows you to click on the image to target specific tones in the image. When you click on the image, a point will be placed on the curve. That point represents the specific tone you clicked on.

Use the Targeted Adjustment Tool to click on the brightest area within the part of the image that needs contrast. In the lesson example, it's the bright snow on the mountain. You'll see a point appear on the curve, representing that tone. This point will stay in place on the curve, ensuring those bright tones won't be changed by additional curve points.

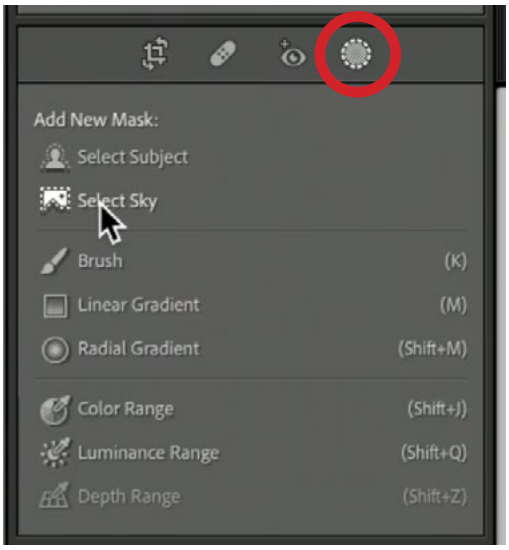
Then, use the Targeted Adjustment Tool to click and drag down on the dark area within the part of the picture that needs contrast. This will place a second point on the curve and move it down, darkening that targeted tone. The farther down you drag, the darker the area will become.



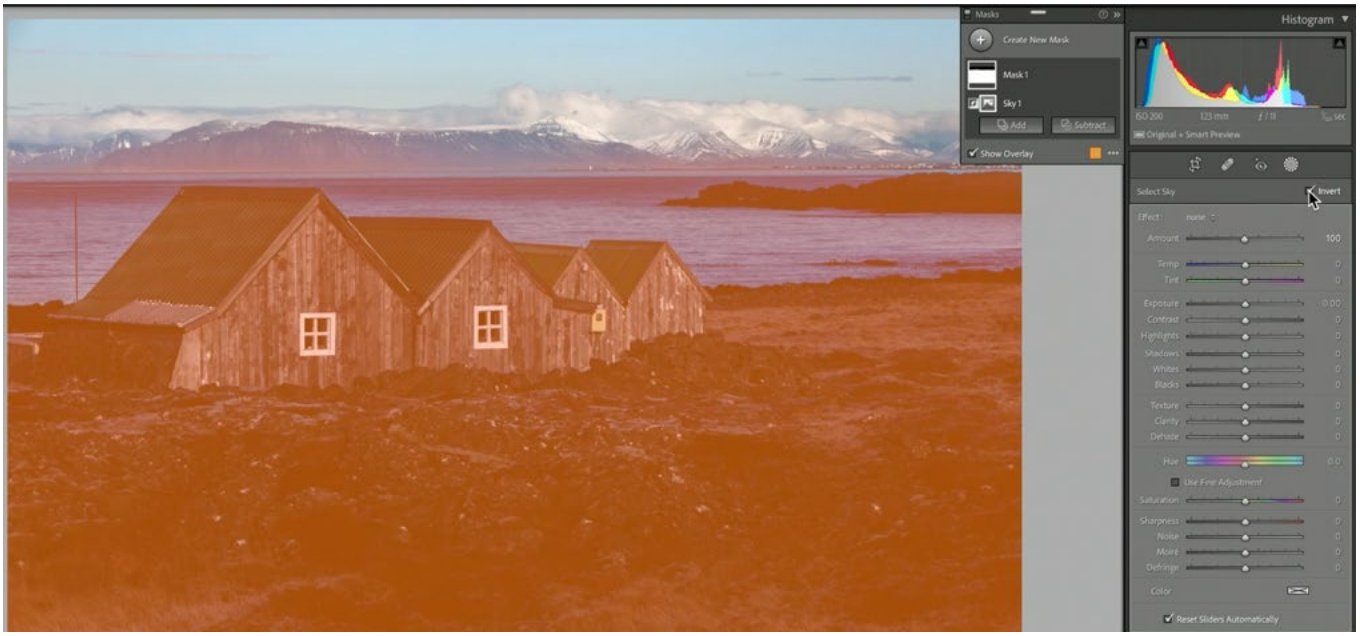
Two points were placed on the curve. The upper point is locking the bright areas in place. The lower point was moved down, darkening those darker tones.

Adjust results using masks This will improve the contrast in the area you were targeting, but other parts of the image may be adversely affected by the adjustment. In the lesson example, the mountains look much better, but the darker foreground has become too dark.

Lightroom's masking feature can be used to correct this. The masking icon can be found in the toolbar above the Basic Panel. When you click it, several masking options appear. The best choice will vary from image to image. In the lesson example, we want to correct everything except for the sky and mountains, and the Select Sky option worked well to isolate this area. After choosing the Select Sky option, we turned on the Invert check box so that everything EXCEPT the sky was selected. A colored overlay will appear over the area being masked.



The masking icon was chosen & the list of mask options appears.

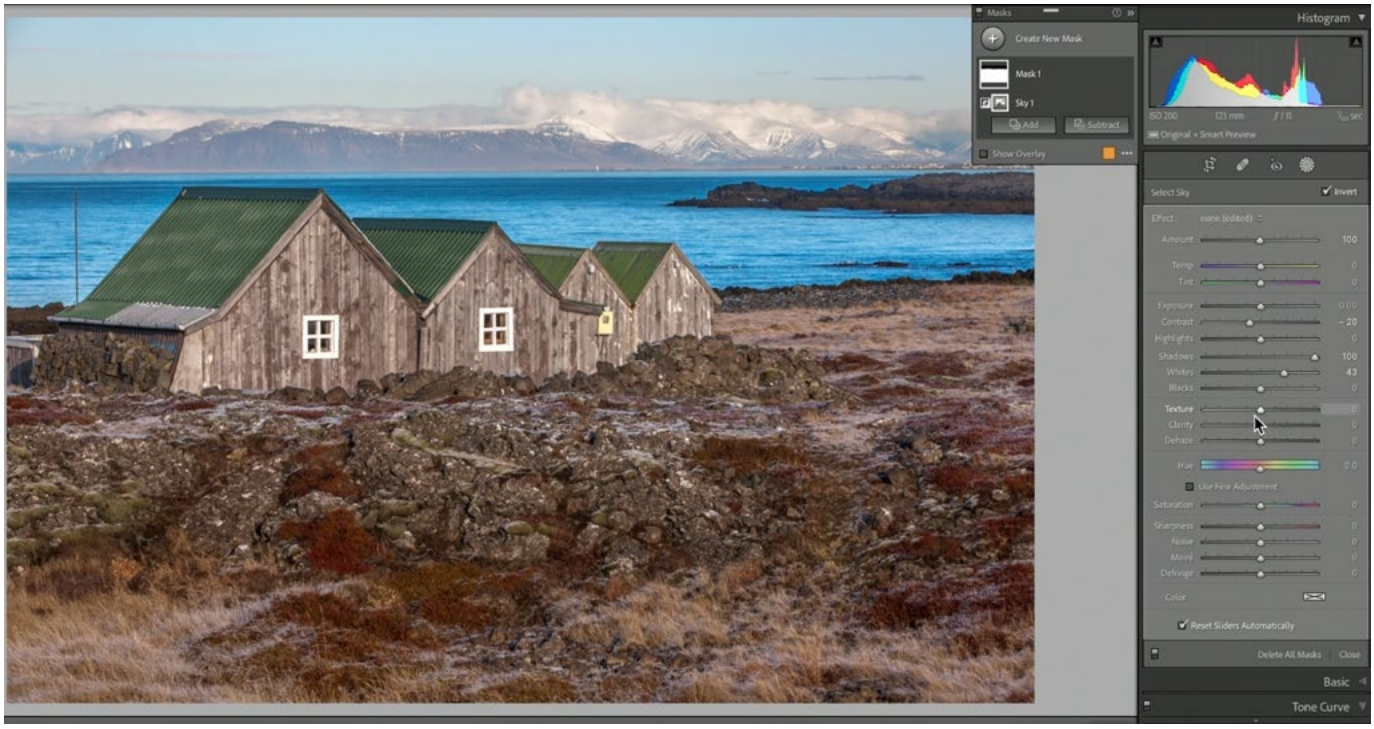


A Select Sky mask was created and that mask was inverted. The colored overlay appears over the area being isolated.

After you have created a mask to target the area you need to correct, you can use the adjustment sliders on the right. As soon as you move a slider, the overlay will disappear so that you can see how the adjustment is affecting the image. If you're trying to lighten an area that became too dark, try increasing the Shadows slider. That did a great job in the example image.

You can also make the area pop by increasing the Whites slider. This makes the bright areas lighter while leaving the dark areas alone. The histogram is a good indicator of whether the Whites slider may be useful. If there is a large gap on the right side of the histogram, it means that there are no white areas. Therefore, increasing the Whites slider will fix that.

The sliders in the HSL Panel can be used to adjust individual colors, if needed. I felt that the blue water was too colorful, so I moved the blue Saturation slider down. This did not affect the blue sky because that area is not isolated by the mask.



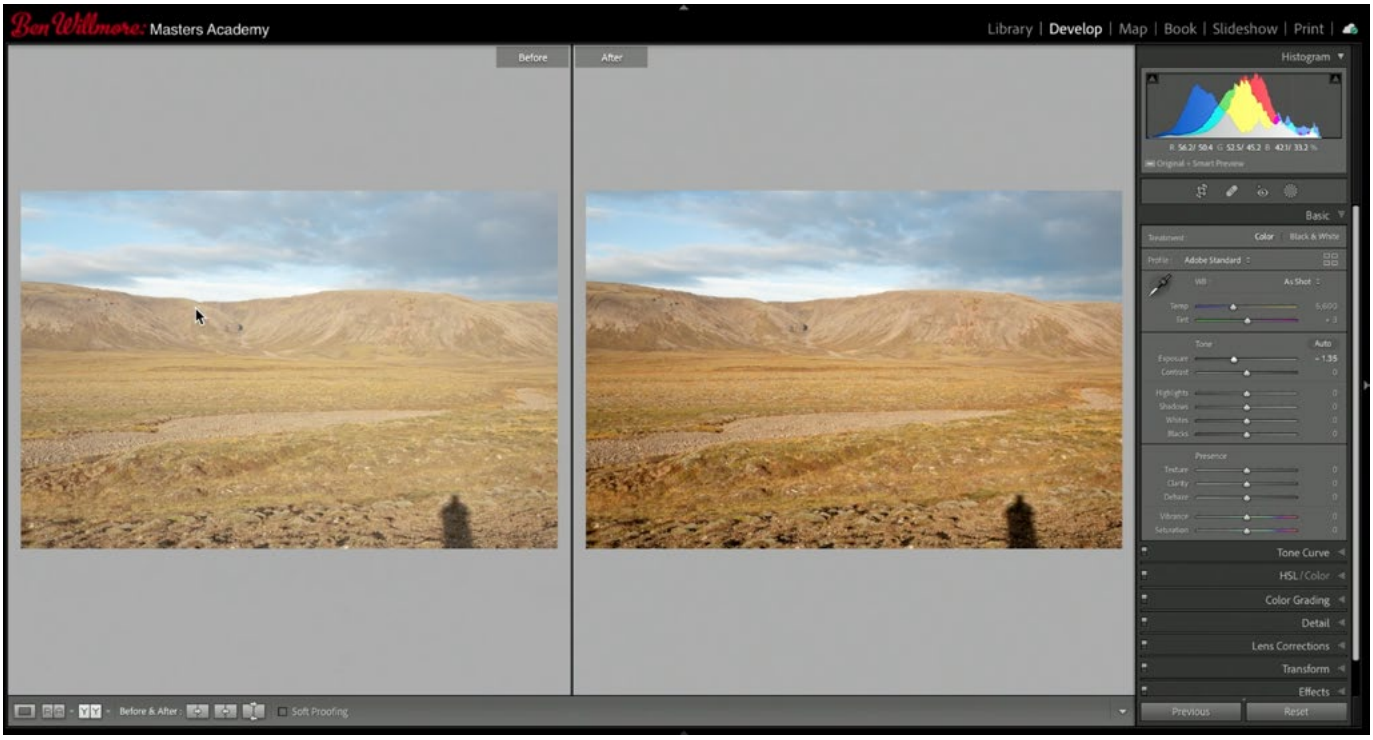
With the foreground isolated with the mask, the Shadows slider was increased and the Whites slider was increased.

When to Use Linear Profiles (36:19)

Linear profiles can be a useful starting point for images with a lot of bright areas, but they are not always necessary. In fact, there are other adjustments that may do a better job at optimizing some of these types of images. Let's look at how you can tell if an image will benefit from a linear profile or if a different adjustment should be used instead.

Open an image in Lightroom's Develop Module and activate the before and after view, which can be accessed by clicking the Y|Y icon below the image window. This will show a before version on the left and an after version on the right. Set the After version to use the linear profile. Then, swap the two versions by clicking the Swap icon below the image window. This places the linear profile image on the left, as the before version. Now the adjustment settings will affect the other version.

Now you can try to optimize the image without using the linear profile. You can experiment with lowering the Exposure slider if the image is too bright. In the lesson example, that did a really nice job.



The linear profile was applied to the version on the left and the Exposure was lowered on the version on the right.

The Blacks slider can also be useful if you need to add a black point. You can tell if there are no blacks in the image if the histogram has a gap on the left side. The Dehaze slider can also do a great job at making the dark areas pop more. Just know that it's easy to go overboard with this setting. You will be able to push this slider further when working on the linear adjustment image.

Continue swapping the two versions and making adjustments to each. This will give you a good idea of whether or not the linear profile was beneficial. The view that's on the right (After) is the version you're going to end up with. Exit the before and after view by clicking the left-most icon below the image window.

If you'd like to save both versions, you can use Snapshots. Expand the Snapshots Panel on the left side of the Develop Module. Click the Plus icon (+) at the top of the panel to create a new Snapshot of the After version. Then, swap the versions and create a second Snapshot. If you ever make changes to one of those images and want to update the Snapshot, you can do so by right-clicking on the name of the Snapshot and choosing Update with Current Settings from the pop-up menu.