

# Low Light Photography

....and a quick primer  
in basic image  
editing

Low-light photography can be fun and rewarding, as well as quite challenging. This becomes an even greater challenge if you choose, or are required, to forego a flash. There are times, as well, when a flash just gets in the way of good low-light photography. Once you start working with a light level that can't be exposed with a hand-holdable shutter speed, it is difficult to get flash exposure low enough that it doesn't create a hot spot of light that detracts from the picture more than it contributes.

# *Low Light Art*

All too often, people make mistakes in low light and decide to capitalize on them as “art.”

The following is a set of examples of what not to aim for in low light...

# Black Cat in a Coal Bin at Midnight



# South Nags Head, After Dark (Panoramic)



# Ill-Fitting Lens Cap



# Low Light Tools

A. High ISO

B. Fast Lens

C. Tripod/Monopod/Beanbag

D. Post-Production Processing



# High ISO

With digital cameras, ISO has become as variable a factor as shutter speed and lens opening. As the light diminishes, we can just keep running up the ISO to compensate, up to a certain point.

# High ISO allows faster shutter speeds



18~135 f/3.5~5/6 1/160 sec. at f/5.6, ISO 800

# High ISO Pros & Cons

The higher you set the ISO on your camera, the more responsive the sensor is to light. At ISO 100-200, we shoot in bright daylight without much thought to image quality, because we aren't really losing any. When there's very little light, we need higher ISO settings, and this convenience comes with a price-



NOISE!

More digital noise leads to less clarity and less color accuracy.

# Digital Noise

Digital Noise isn't so bad at lower ISO's or in bright light; in fact, most people don't even notice it at all. Until it gets printed full size.



Nikon D200

ISO 400

# Digital Noise

Here's a quick noise comparison from a Canon 40D, a very noise-free camera starting at ISO 200 and going up.

# Digital Noise at ISO 200



# Digital Noise at ISO 800



# Digital Noise at ISO 3200





# Digital Noise

Digital Noise is most evident in flat, single-color fields, like the sky. In astral photography, it can make enough of a mess of a picture as to render it useless...

# Is it stars or noise?

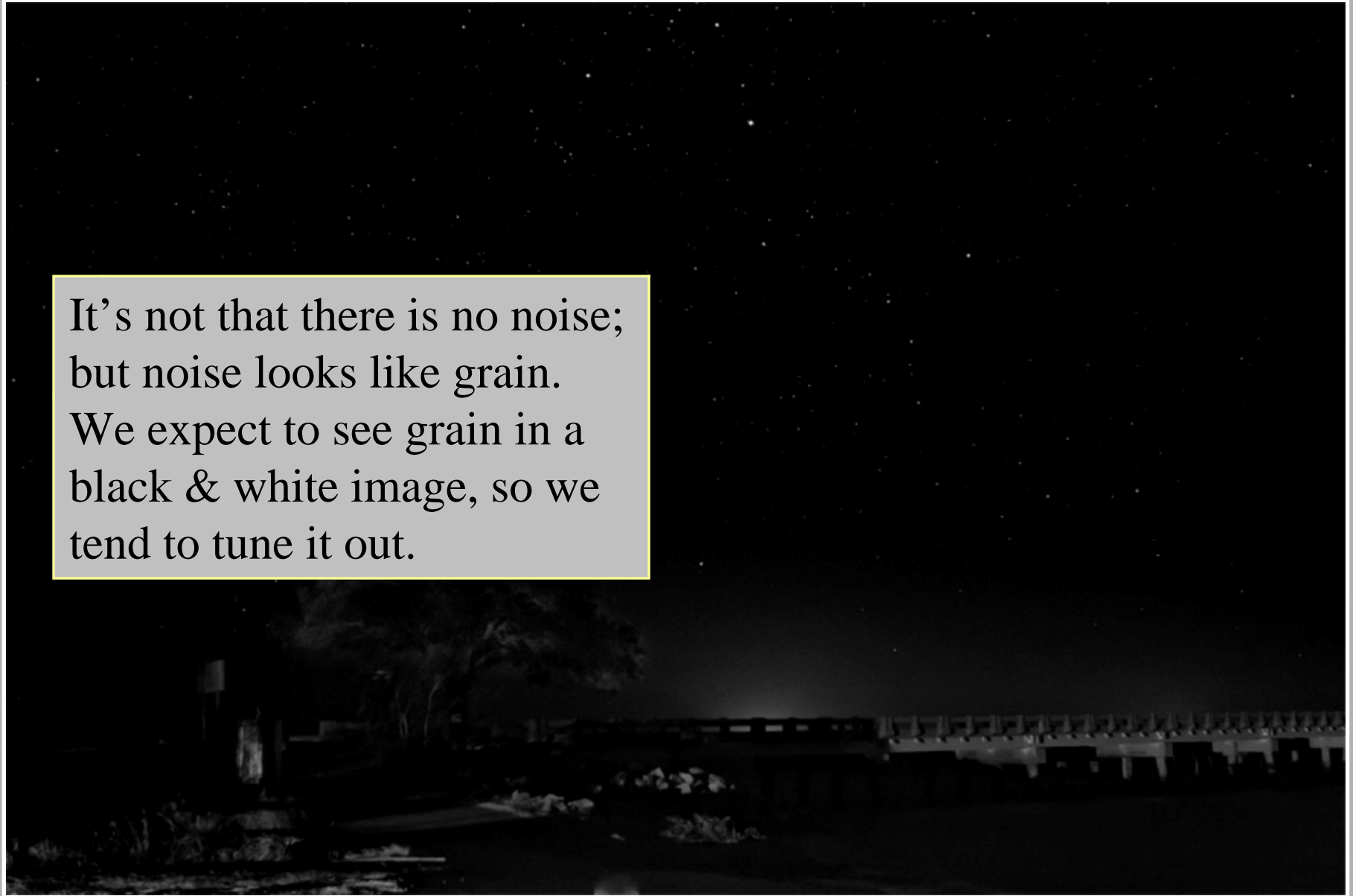


Canon 40D  
ISO 1600

There's a cheap trick to help with luminance noise...

# B&W=Cheap Noise Fix

It's not that there is no noise;  
but noise looks like grain.  
We expect to see grain in a  
black & white image, so we  
tend to tune it out.



# A Fast Lens Helps Too...

A fast lens won't reduce digital noise directly, but it will help get a better exposure; and that can reduce noise as well as just helping get a better picture.

# Fast Lens

## Pros:

- Takes better advantage of light
- Allows more control of depth of field
- Usually has better optics

## Cons:

- Costs more
- Weighs more
- Shorter zoom range



# Cheap Lens vs. Pricy Lens

Sigma 55-200 f/4~5.6  
at f/5.6 on a Canon 7D

\$159 new, \$79 used

# Cheap Lens vs. Pricy Lens

Canon 60 f/2.8 Macro  
at f/2.8 on a Canon 7D  
\$429 new, \$200 used



# Really Pricey Lens!



**Canon 85 f/1.2 at f/2.2**

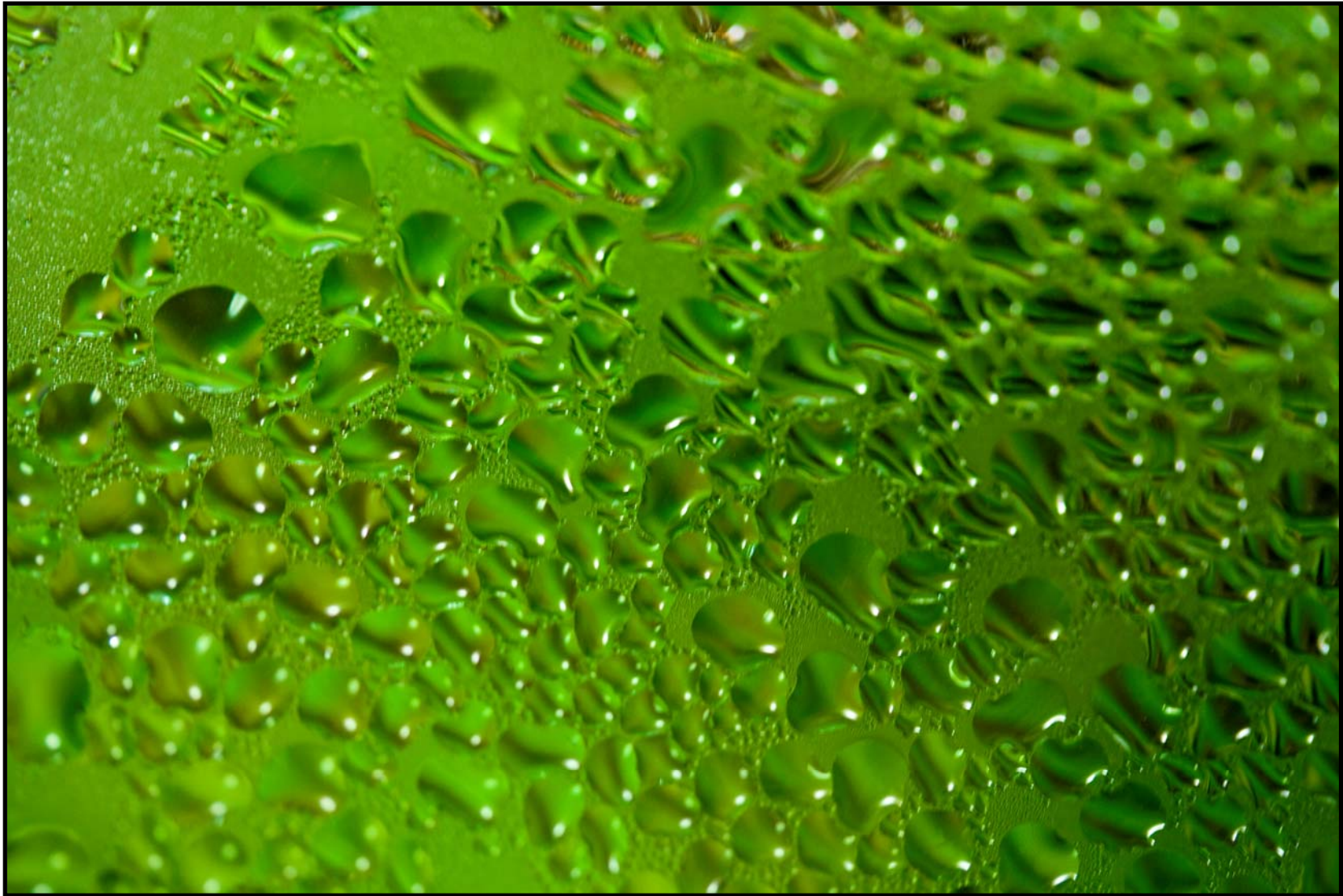
**ISO 100 at 1/60 sec.**

**About ten minutes after sunset, surrounded by trees, darkened in Camera Raw because it was too bright.**

**Note the depth of field in the grass in the foreground.**



# Takes Better Advantage of Light



Asparagus at F/2.8 under a stovetop light

It even works with carrots...



# Another Fast Lens Advantage...

When shooting in low light, and not using flash; we want to bias our exposure to the subject. This often leads to an underexposed background. Underexposure enhances noise, so to reduce the evidence of noise, less depth of field will soften the background making the noise less distracting.

# Narrow Depth of Field



# Fast Lenses

One of the reasons a very fast lens tends to cost more is that the manufacturer tends to put more effort into the build quality of these lenses and uses better glass for the parts that really count: the lens elements.

A 50mm f/1.8 lens (which is very fast) will usually cost about \$100 to \$150. Used, they can dip well below \$75. That's a great price for an excellent low light lens.

A 50mm f/1.4 lens (amazingly fast) is well over \$400 new; and you'll be hard pressed to find a used one for under \$250.

A 50mm f/1.2 (scary fast) will be well over \$1000, and not much less used. The Nikon version only comes in manual focus.

# Cheap, Good Lenses

A used, recent model Canon or Nikon 50mm f/1.8 is an excellent short telephoto lens on an APS-C sensor camera, and a handy normal lens on a full frame sensor camera. These can usually be found for comfortably below \$100.

They're sharp, inexpensive, fast, and small enough for a jacket pocket or small pouch.

# Cheaper, Good Lenses

A Nikon manual focus 50mm f/1.8 can be found for a little over \$50; and the old manual focus 50mm f/1.4 is available for under \$150. Much the same can be said for older Pentax lenses. Remember, many of the advanced features of your digital camera may not be available when you're using these lenses, particularly Matrix or Multi-segment metering.

Regrettably, Canon, Olympus, and Minolta (Sony) manual focus lenses won't work on the auto focus cameras without an adapter, and those adapters aren't great.

# A Little Support

Tripods, monopods, mini-pods, and bean bags are very useful when shooting non-moving or very slow moving subjects in low light. That little bit of added stability can be the difference between an excellent picture and a total loss.



# IS, VR, PDQ ASAP

Canon started it with Image Stabilization, now everyone has a version of it. Nikon calls it Vibration Reduction, Pentax calls it Shake Reduction (Canon and Nikon beat them to all the cool names), Olympus and Sony call it Image Stabilization, but don't use the trademarked "IS" badge that belongs to Canon.

The end result is the same, less problems from camera shake at slow shutter speeds.

# Image Stabilization

Canon and Nikon insist on putting their IS and VR functions into the lenses, which means some lenses don't have it.

Olympus, Pentax, and Sony put it in the camera bodies so that it works with almost any lens.

Each insists, of course, that their system works better.

Play with them and decide for yourself.

# Image Stabilization

If you use the image stabilization features of your equipment, turn it off when you use a tripod.

The system can interpret subtle movement of the subject like blowing leaves or grass, as camera motion and try to correct for it and create blur.

A couple of cameras now know when they're on a tripod and turn off image stabilization automatically, finally.

# “Expanded” ISO

Digital cameras give us more freedom than film does with under exposure. Under exposed film could be push-processed, if you knew what you were doing and could find a lab that was willing. Most DSLR's have a built-in push processing feature. The efficacy of that process varies wildly from camera to camera and from one situation to the next. Many newer cameras have a top ISO of 3200 or 6400 or even 12800 which is followed by a setting of “H” or “H1” and “H2.”

# “Expanded” ISO

The “H” ISO settings are the digital form of push processing. When shooting film for push processing, you would load a roll of 400, shoot it as if it were 1600, and ask the lab to “push” it two stops. The oversimplification of push processing is that they would over-develop it.

That’s what the Expanded ISO feature is on your DSLR. If your maximum ISO is 6400 and you set your camera’s ISO to H, you’re not really shooting at 12800, you’re under exposing 6400 one stop and the processor in your camera is making it look like it was correctly exposed.

# “Expanded” ISO

Expanded ISO works pretty good if you actually get good exposures for the imaginary ISO, but most of us crank the ISO to the moon and then under expose even that. This is why most people are unhappy with expanded ISO. Used correctly, it usually does a decent job; but we rarely use it correctly.

# “Expanded” ISO



Canon 7D, Canon 60mm f/2.8 Macro f/2.8, 1/40 sec. ISO-H (12800)

# Faking an “H” ISO

One more in the ever-growing list of reasons to shoot Raw files:

If you don't have an “H” setting on your camera, or prefer to just “push-it” a bit your self, you can. With raw files, there's enough margin for error that you can under expose a bit and bump it back up with a raw edit. It is very easy to do, and doesn't require any special skills or programs. Photoshop is great, but the Raw editing program that came with your camera will work just as well.



# Faking an “H” ISO

The effectiveness of this process varies from camera to camera as well as from one situation to the next. A bit of testing with your camera should come in handy before you encounter an important picture you really want. Usually you can get away with under exposing as much as a stop.

If you need ISO 3200 and you can only get ISO 1600, shoot at 1600. If you shoot manually, just under expose a bit, it doesn't really matter how much as long as you don't get too carried away. If you use automation, just set your exposure compensation to  $-1/3$ ,  $-2/3$  or  $-1$  and shoot.

# Faking an “H” ISO

Once you’ve copied your card to your hard drive, open the under exposed images in your raw editor and increase the exposure until it looks good. You may need to raise black point or contrast but that’s just another slider to move left or right. More on that later.

...and this segue’s nicely into...

# The Magic of Photoshop

The attitude of “Why shoot it right when I can fix it in post?” has gotten a bit pervasive. You will always get better results if you shoot it right and deal with the weaknesses in post-processing. Once in a while, the situation will arise when you want (or need) the shot, and it’s just too dark. Do the best you can with what you’ve got, and maybe you can improve on it later. This is yet another reason to get away from JPEGs and shoot RAW.

# Post Processing

With a raw file that has already been shot, you have control over the exposure, the shadows, the highlights, the contrast, the saturation, the sharpness, the color balance, and much more. You can do much of the same with a jpeg, just under tighter limitations. You can even crop (to some extent) to compensate for the lack of a telephoto lens. The program that came with your camera offers you all of those controls. There are other programs that offer those controls through a different, sometimes more user-friendly interface.

# Post Processing

Depending on your particular needs, skill level, determination, and budget; there are programs that offer you powerful tools for editing and improving your images. Not-so-hot images might be made great; outstanding images might be made amazing.

Adobe Photoshop is the most popular program with professionals who want to get the most from their images, but there are other programs that provide excellent tools to help your pictures along.

# Image Editing Programs

If you're still saving up for that big Photoshop purchase, but you want to edit **now**, try the GIMP. The GIMP (GNU Image Manipulation Program) is open-source freeware. What that means is that countless talented programmers are working on this program so you can download it at [www.gimp.org](http://www.gimp.org) for free and start using the closest thing to Photoshop available.

Paint.net is another example of powerful freeware. You'll find it at [www.getpaint.net](http://www.getpaint.net). It is a little simpler to work with than GIMP, but is still full of powerful features.

# Image Editing Programs

Adobe's inexpensive alternative to Photoshop is Photoshop Elements. It ranges from a touch over \$100 to a touch under and offers similar functionality to Photoshop with reduced features and a slightly simplified interface. You can download a trial version of it at [www.adobe.com](http://www.adobe.com) and if you decide you want it you can run out to the software store or just purchase a serial number from Adobe online for about \$100 and receive that wonderful feeling of instant gratification.

# Image Editing Programs

Adobe has just reduced the price of Photoshop Lightroom 4 to about \$150. You can download the demo for that at [www.adobe.com](http://www.adobe.com) and if you prefer that to Photoshop Elements, you can buy a serial number online or go grab it at your corner office supply. More instant gratification.

If you download a program, download the installer instead of running it from the Internet. Remember, if you buy the download, you don't get a disk. You'll want to write your downloaded install program to a disk for safekeeping.

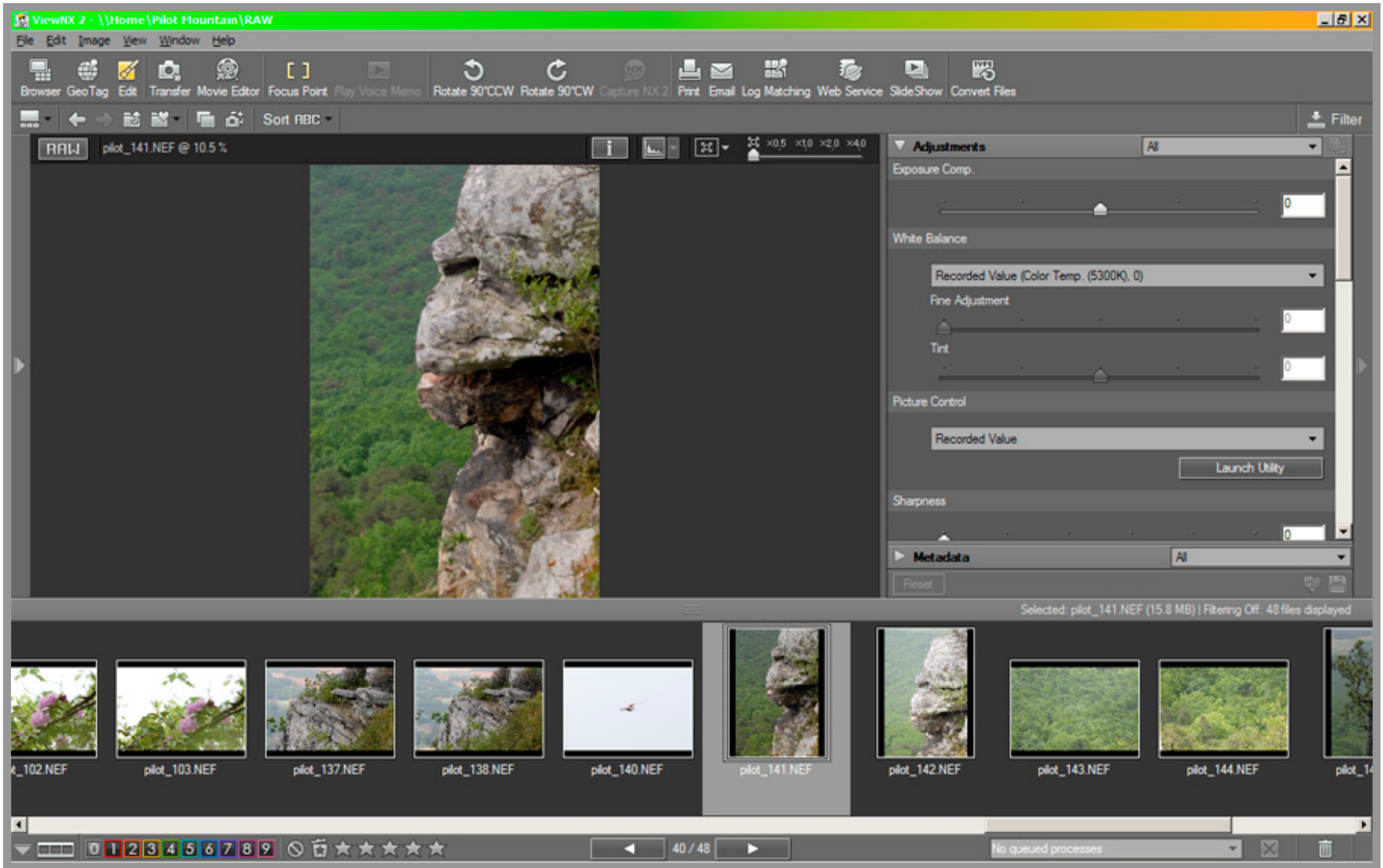


# Post Processing

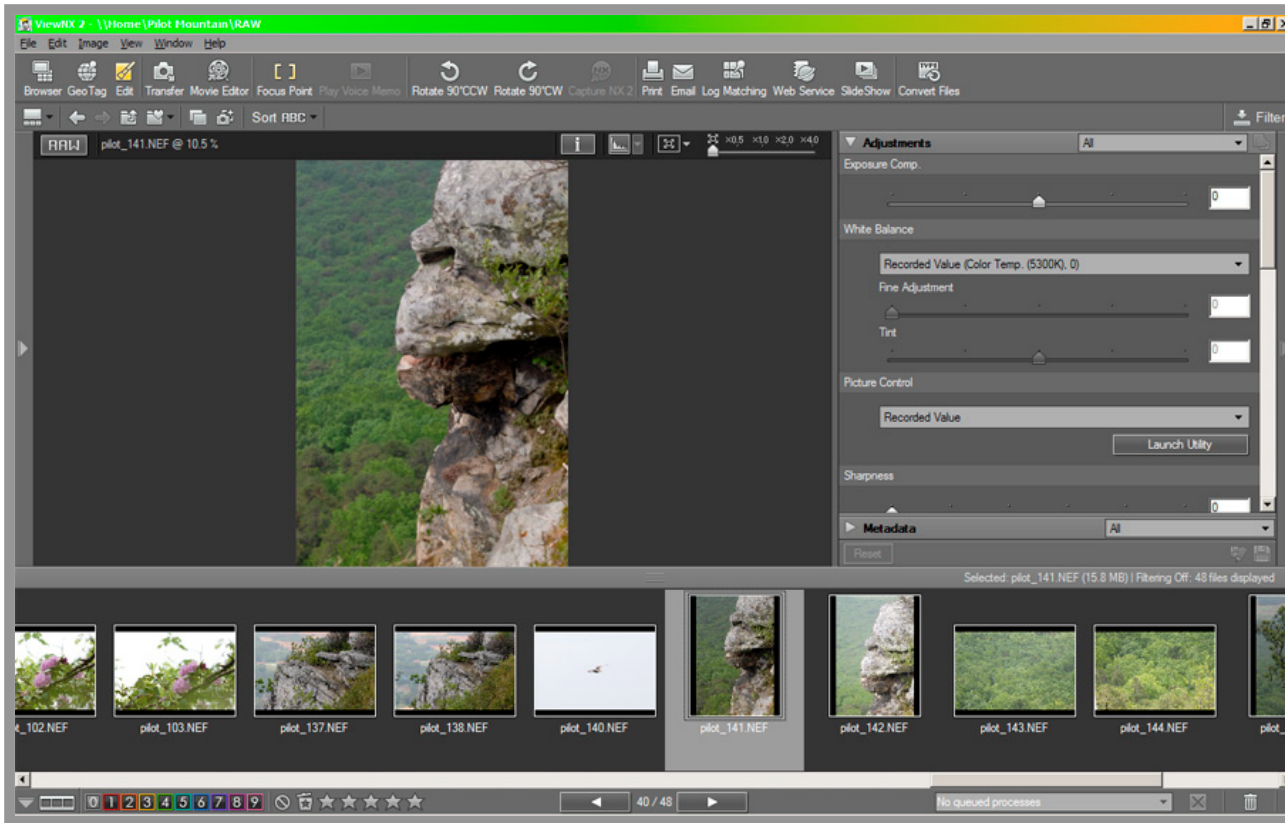
Once a camera has created a digital image, there's plenty left that can be done with it. Just a bit of refining can bring an image from bland to grand. Adobe Photoshop, Canon Digital Photo Professional, and Nikon View NX2 all have provisions for "fine tuning" an image file.

The main things we'll talk about here are adjusting Exposure, White Balance, Black Point, and Noise Reduction.

# Nikon View NX 2



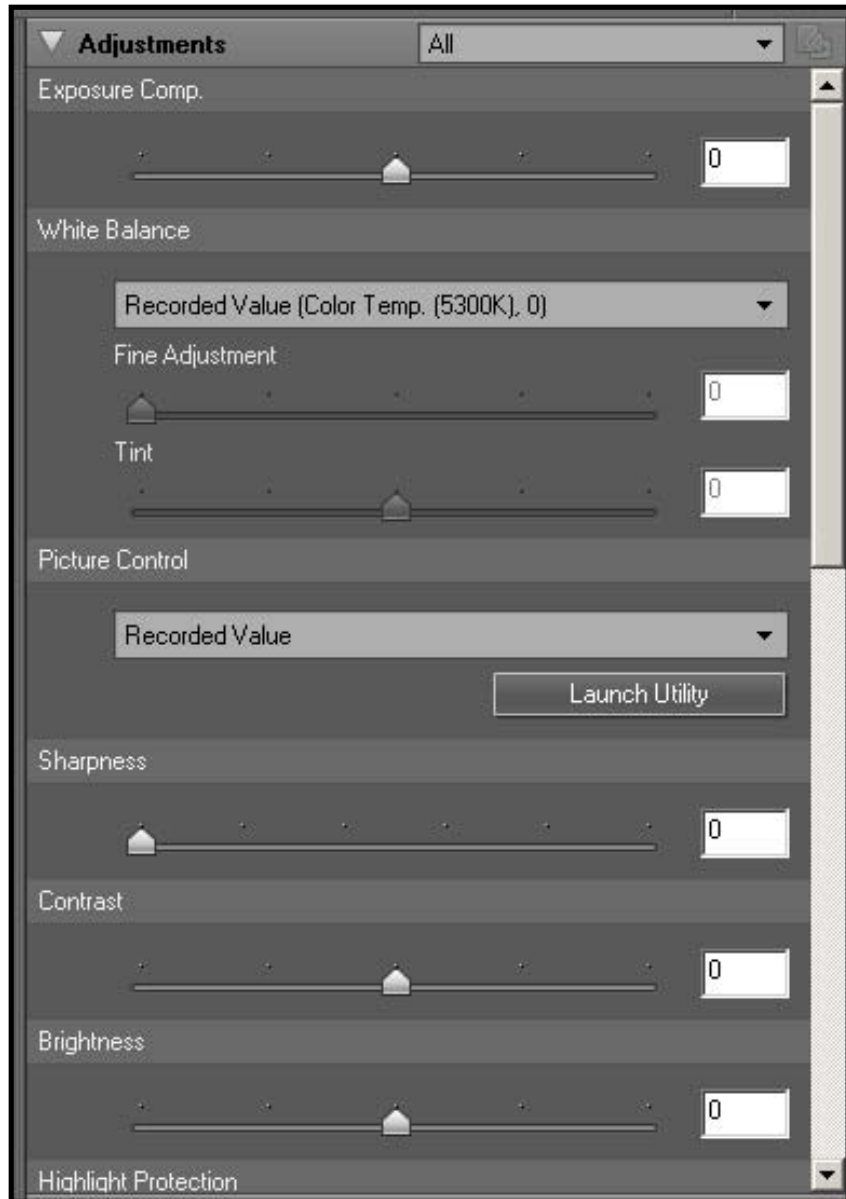
# Nikon View NX 2



Using the Edit button at the top left you can summon forth the image editor. The first thing you will see in the image editor is the Adjustments drop down which starts with “Exposure Comp.” This control can lighten or darken the whole image.

Below that is the White Balance control. It will default to the camera’s setting, you have to select one of the presets on the drop down menu in order to unlock it to begin manually adjusting the white balance. After that are controls for Sharpness, Contrast, and Brightness. There are also controls to level the horizon, crop, remove red-eye and more. There does not appear to be a noise reduction control in View NX 2.

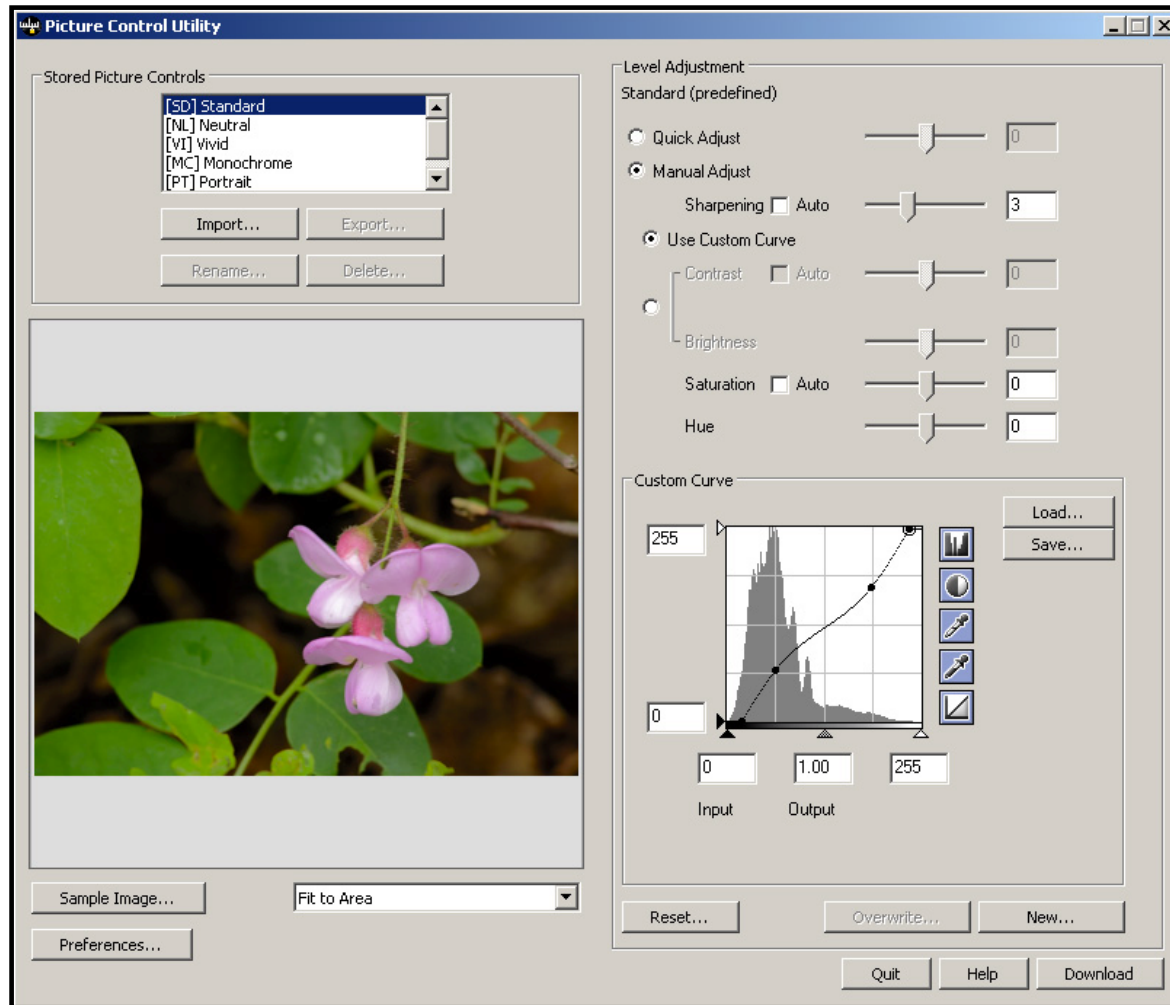
# Nikon View NX 2



A series of sliders makes adjusting image settings very easy in View NX2. The Exposure Comp. slider allows you to modify the exposure of the image to some extent and if you're not quite happy with the white balance, you can fine tune it very precisely along with the tint so you have control of both the yellow/blue and the green/magenta axes. You can even make adjustments to Sharpness, Contrast, and Brightness.

The Picture Control Utility gives you even deeper control over the image...

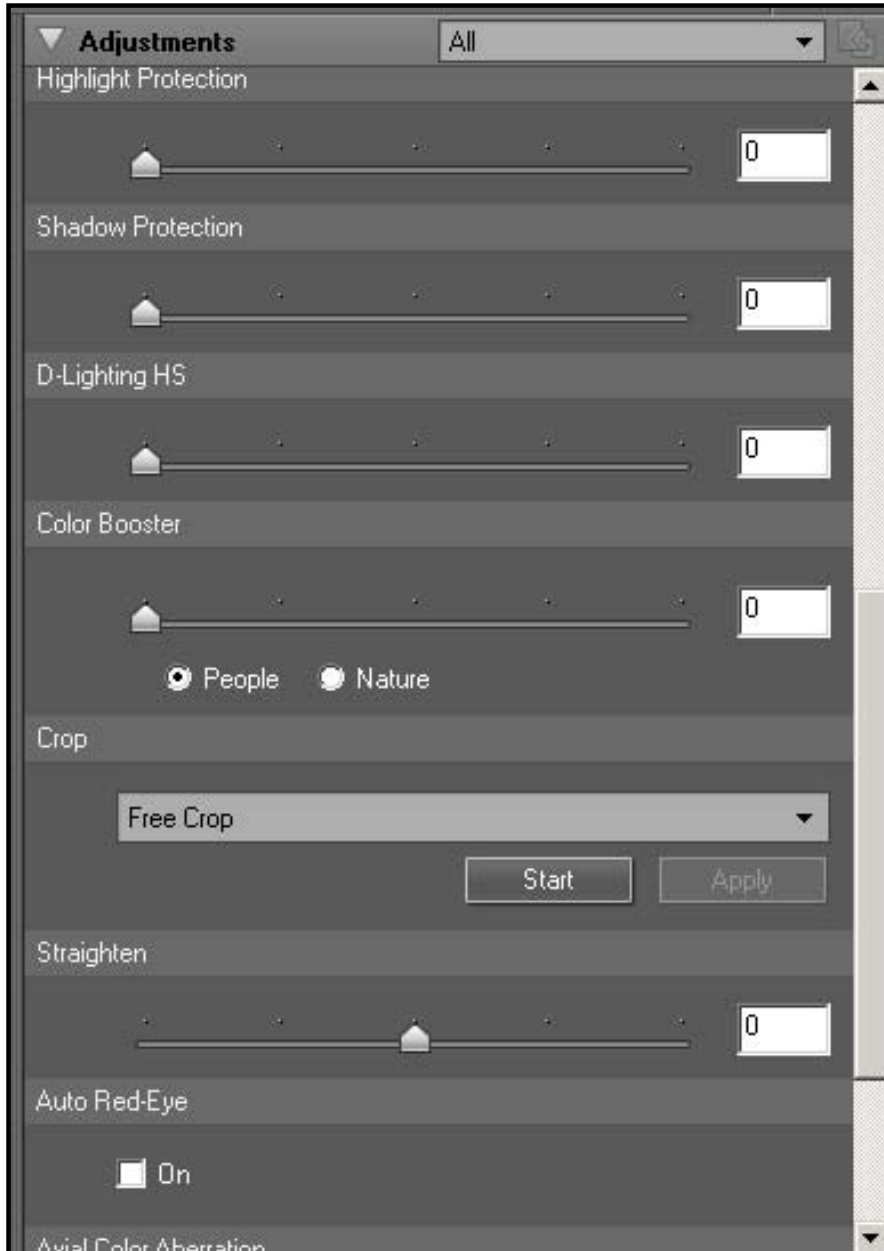
# Nikon View NX 2



The Picture Control Utility lets you make custom curve adjustments or you can apply the program's automatic settings. There are also sliders for Hue and Saturation. Nikon cameras offer preset adjustments they call "Picture Controls." You can apply them here to your raw files if you like.

The image in the sample area will update automatically to render your adjustments so you can decide to keep or discard your changes.

# Nikon View NX 2

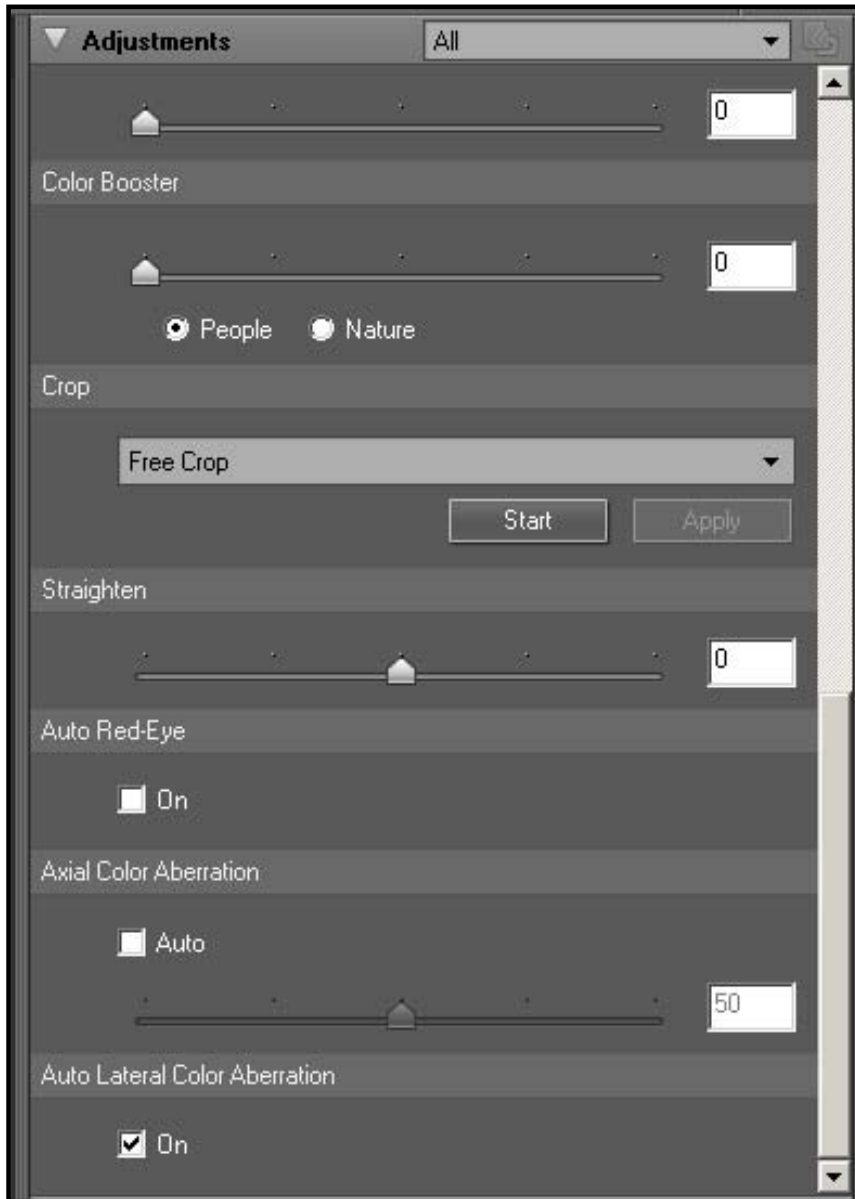


Further down the adjustments controls are Highlight Protection and Shadow Protection which allow you to bring down highlights that are out of gamut and bring up shadows that are too dark.

The D-Lighting HS slider applies automatic correction to shadows and highlights which bring out details that may have been “temporarily” lost at the moment of exposure.

The color booster enhances saturation. Clicking the “People” box will protect skin tones as you boost saturation.

# Nikon View NX 2



At the bottom of the Adjustments drop down are the Crop control, Straighten tool, Red Eye control and the lens corrections.

The Straighten slider allows you to manipulate the horizon, level a picture or just throw it way off if you're an MTV fan.

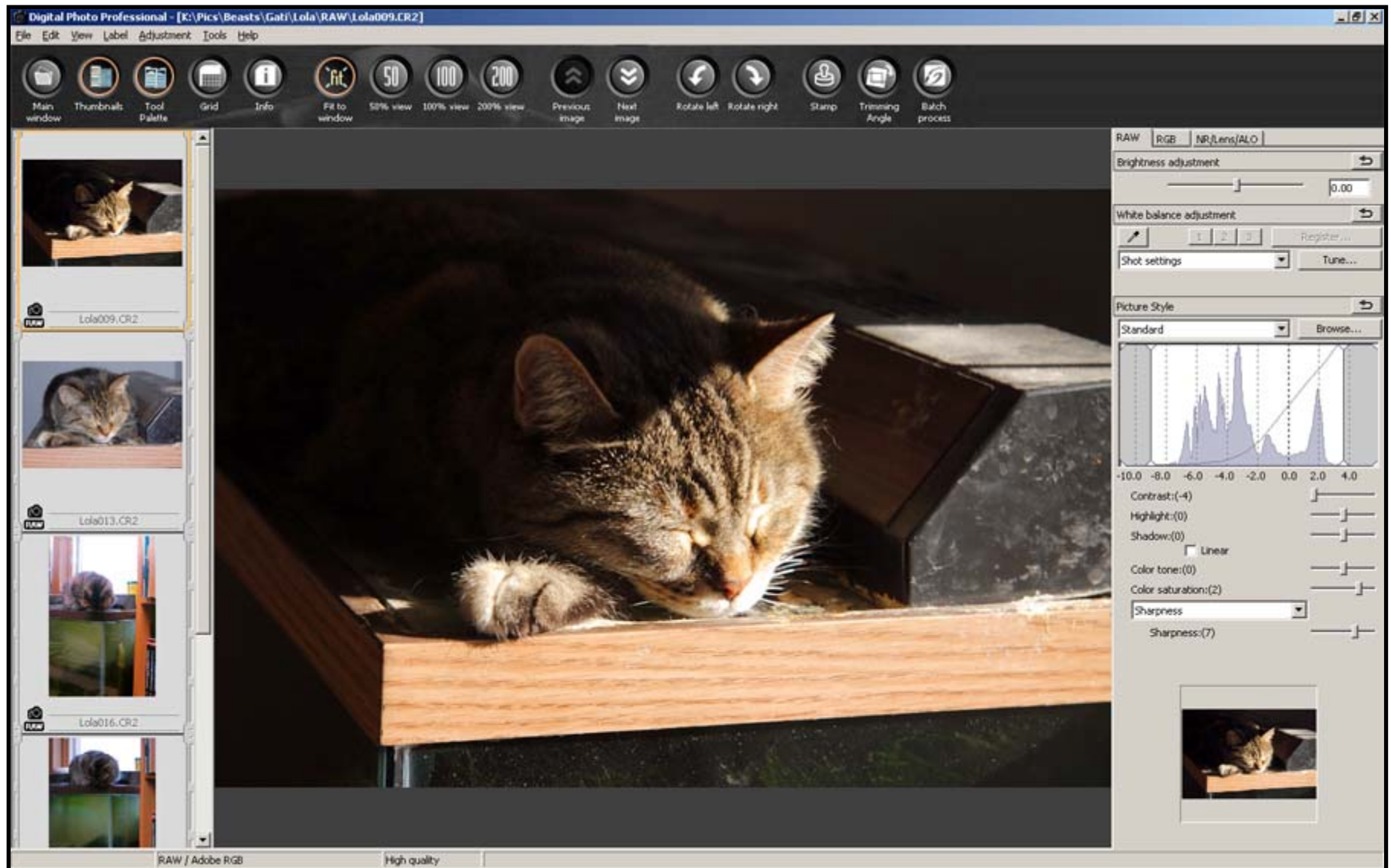
The Axial and Lateral Color Aberration controls are to help minimize the color fringing that sometimes occurs in high contrast situations with long lenses (and with cheap lenses.)

# Nikon View NX 2

The HELP text in View NX2 is thorough and well written, but it's easier to go through the topics rather than attempt to search for an answer. The search function doesn't seem to want to acknowledge the wealth of information that is in the HELP text.

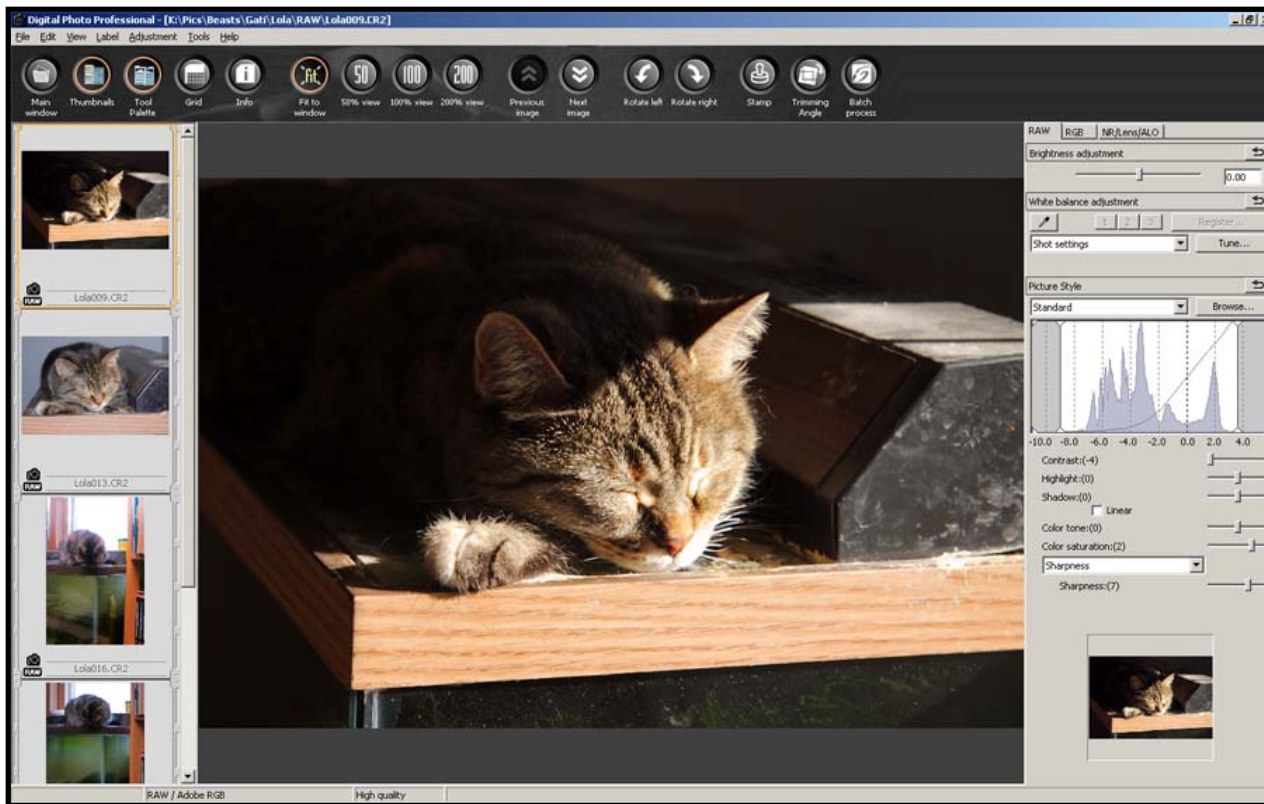


# Canon DPP



Digital Photo Professional is just too many syllables...

# Canon DPP



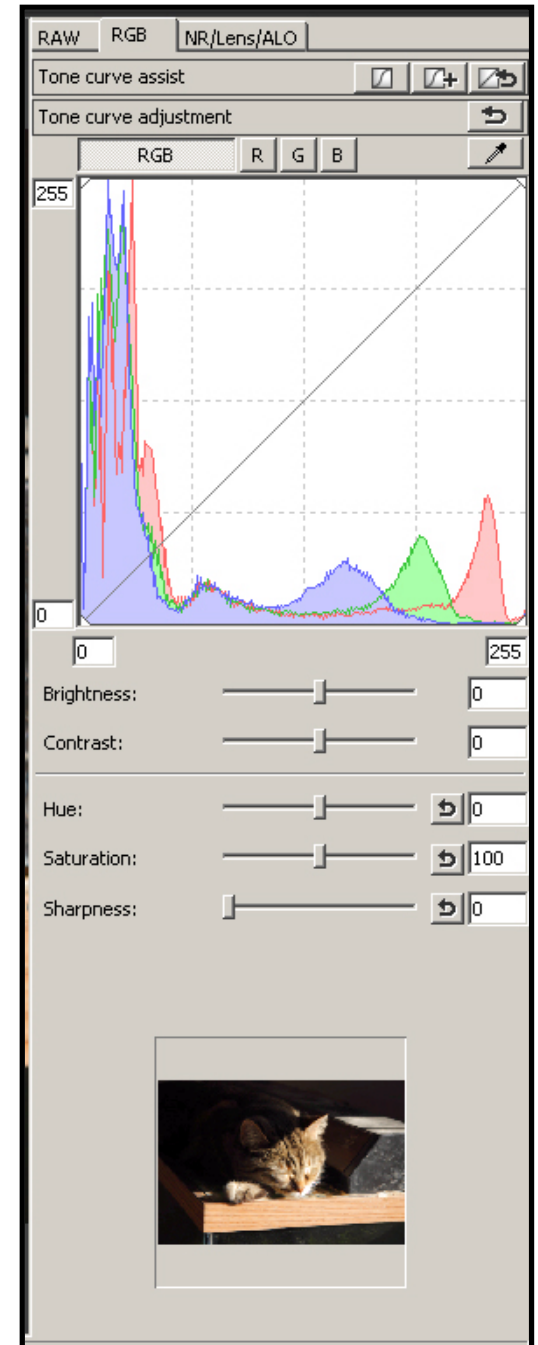
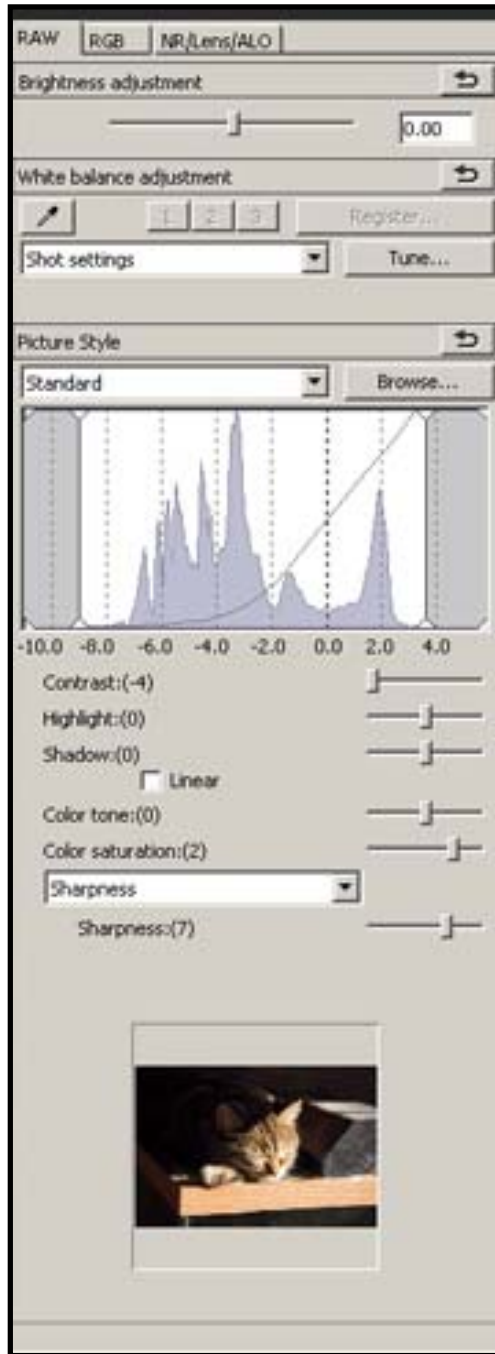
Canon DPP starts as a browser. You must select the images you want to edit, then click the “Edit Window” button near the top left. Your selected images will appear on the left side of

the screen and the first image on the list will appear in the larger window in the middle of the screen. There are three tabbed categories of controls on the right: RAW, RGB, and NR/Lens/ALO meaning, raw adjustments; color corrections via curves; and Noise reduction, lens corrections and the Canon Auto Lighting Optimizer.

# Canon DPP

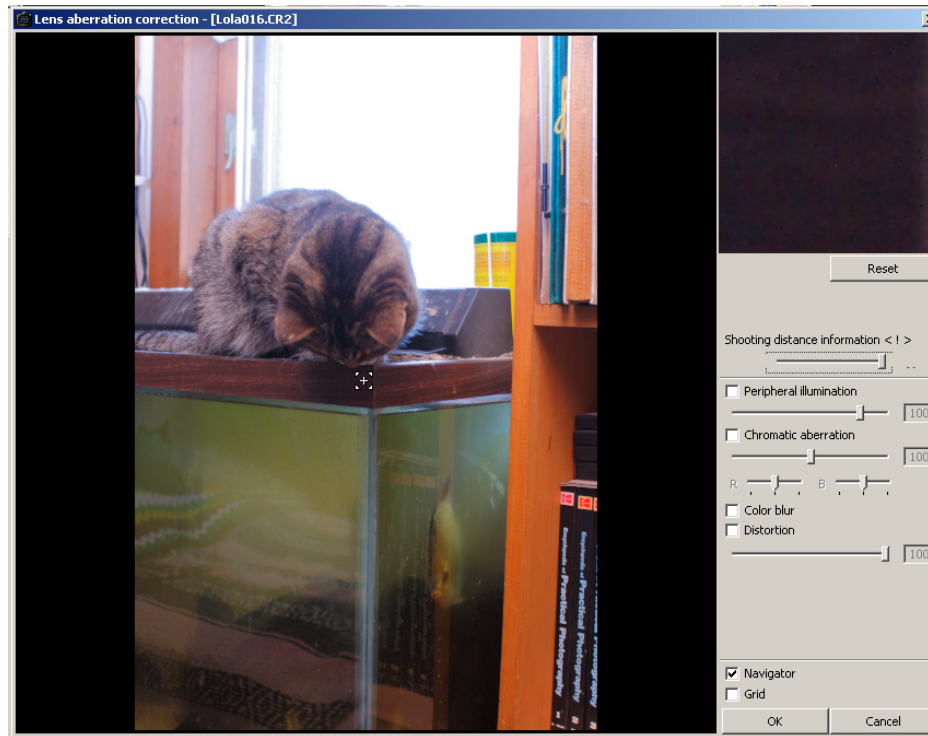
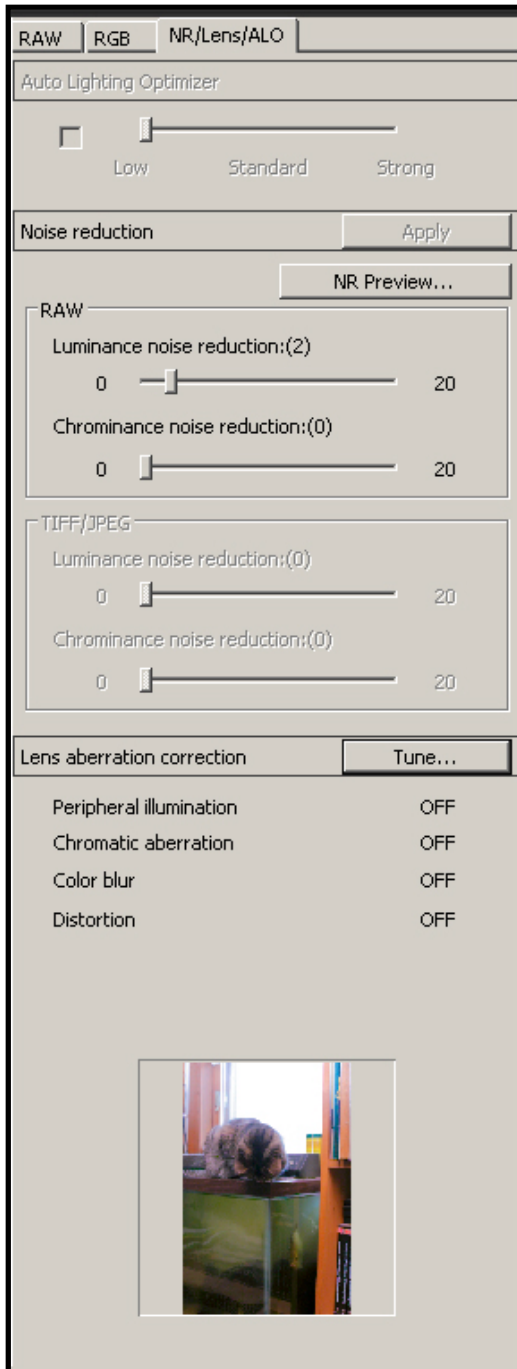
The raw controls are for brightness, white balance, contrast, and sharpness.

The RGB controls allow you to work either directly through the curves and histogram or by using sliders to make adjustments. The four buttons above the tone curve display, RGB, R, G, and B are there to allow you to choose to adjust the full range of colors or just one.



# Canon DPP

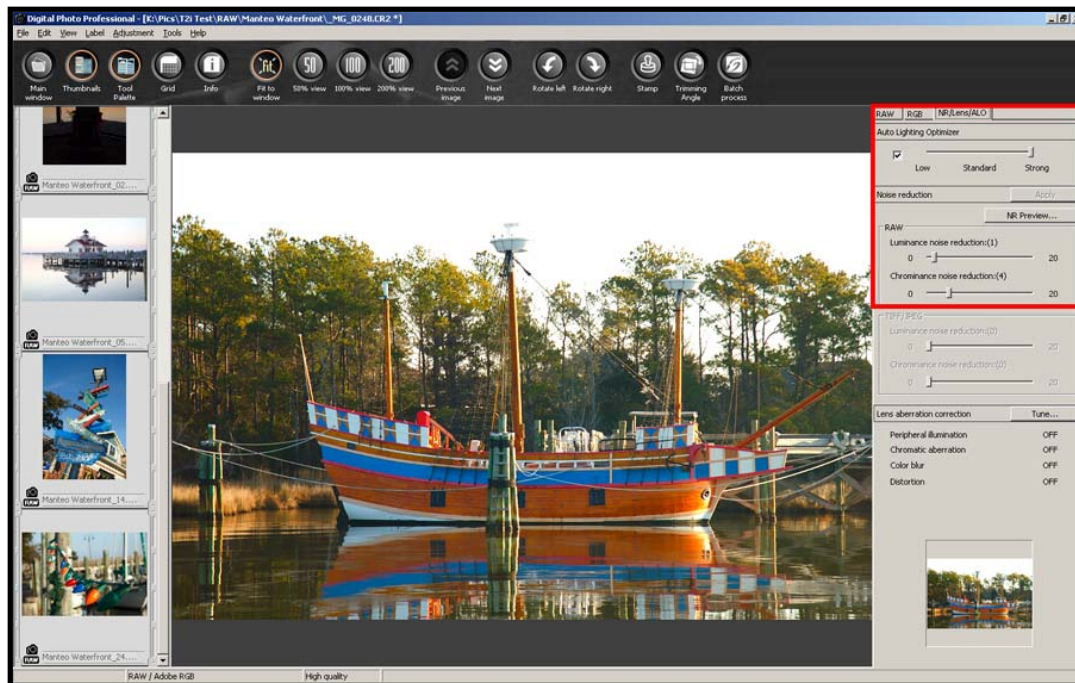
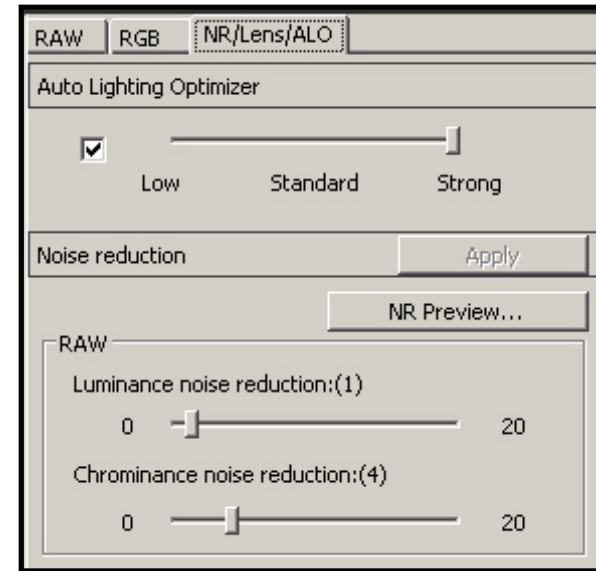
The NR/Lens/ALO control allows you to set noise reduction for both Luminance Noise (problems with light and dark) and Chrominance Noise (Problems with color) via sliders.



The lens aberration control lets you manually adjust for shortcomings that may have occurred in the lens.

# Canon DPP

Canon's Auto Lighting Optimizer is similar to D-Lighting HS slider. With images from newer Canon cameras, it can bring out details in highlights and shadows that require meticulous curves adjustments otherwise. It is quite effective with most images.



The control is simply a single slider that has three settings: Low, Standard and Strong. Adjustments appear in real time as the slider is moved.

# Canon DPP

The HELP text in DPP is well written and surprisingly useful. It covers every aspect of the program thoroughly and in understandable terms. If you want to take that program as far as it will go, that help text is very useful.

# Adobe Camera Raw (Photoshop CS5)



# Adobe Camera Raw (Photoshop CS5)



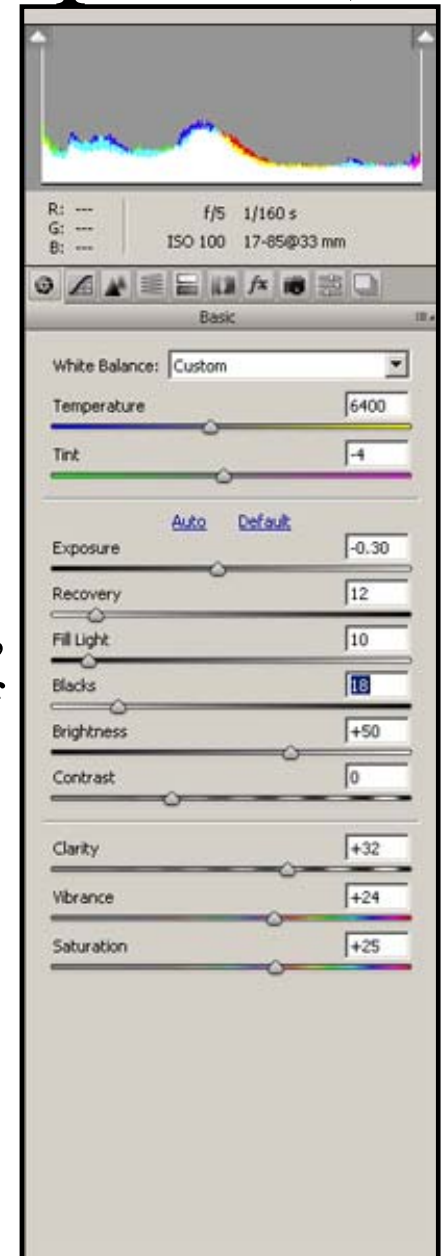
Adobe Camera Raw offers the same controls as the Nikon and Canon programs do, with a somewhat smoother interface. On the left are the files selected for editing in Raw, if you selected more than

one. In the center is a large view of the image being edited, at the top is the tool pallet and on the right are the controls for whatever tool or function is currently in use. Once an image has been edited you have options to open it in Photoshop, save it as a new file, just save the corrections you made to the image's meta-data or cancel the whole thing.

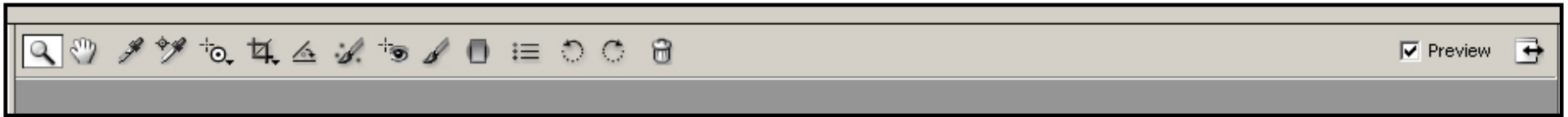


# Adobe Camera Raw (Photoshop CS5)

The interface for Camera Raw is fairly straightforward. In the Basic mode you have control over color temp, tint, exposure, highlight recovery, fill light, black point, brightness, contrast, clarity, vibrance, and saturation; and the histogram, exposure info and RGB point readings reside at the top. There is a little automation available to help speed things up, or you can choose to go your own way. There are ten tabs across the top of the Basic panel, below the histogram, each leading to a different aspect of the controls. There are settings for curves adjustments; sharpening and noise reduction; hue, saturation and luminance; split-toning; lens correction; special effects; camera calibration; presets; and snapshots to save multiple stages or versions of an edit.



# Adobe Camera Raw (Photoshop CS5)



Across the top you will find the tool pallet. When Camera Raw is first opened, the default tool is the Zoom tool. Also available are the Hand tool for navigating within a zoomed image, the White Balance Point Selector, Color Sampler, Targeted Adjustment Tool, Crop Tool, Straightener, Spot Removal, Red-Eye Reduction, Adjustment Brush, Gradient Tool, Raw Preferences, Rotate Left, Rotate Right, and Discard. At the far right is the check box to toggle the preview on and off and the fill screen/manually size selector.

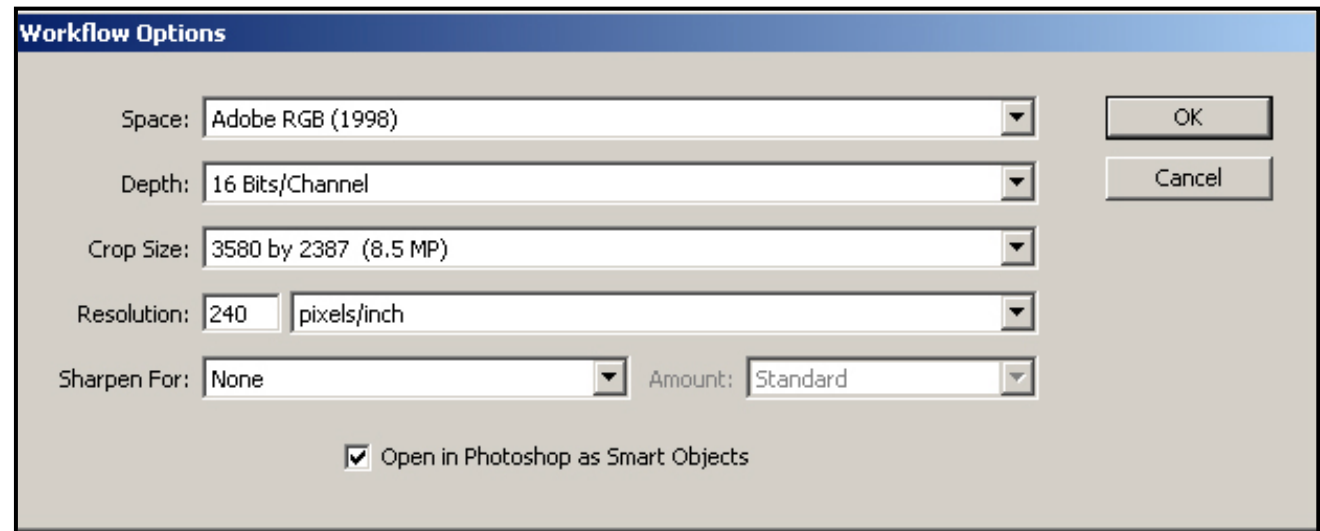
There are keyboard shortcuts for most of the functions and tools as well which can really save time once you're acquainted with them. Placing your cursor above any tool will reveal the keyboard shortcut.

# Adobe Camera Raw (Photoshop CS5)

Across the bottom of the page are the buttons to allow you to save a new image after editing it, open it in Photoshop for more editing, cancel the job, or just save the edits to meta-data without creating a new image.

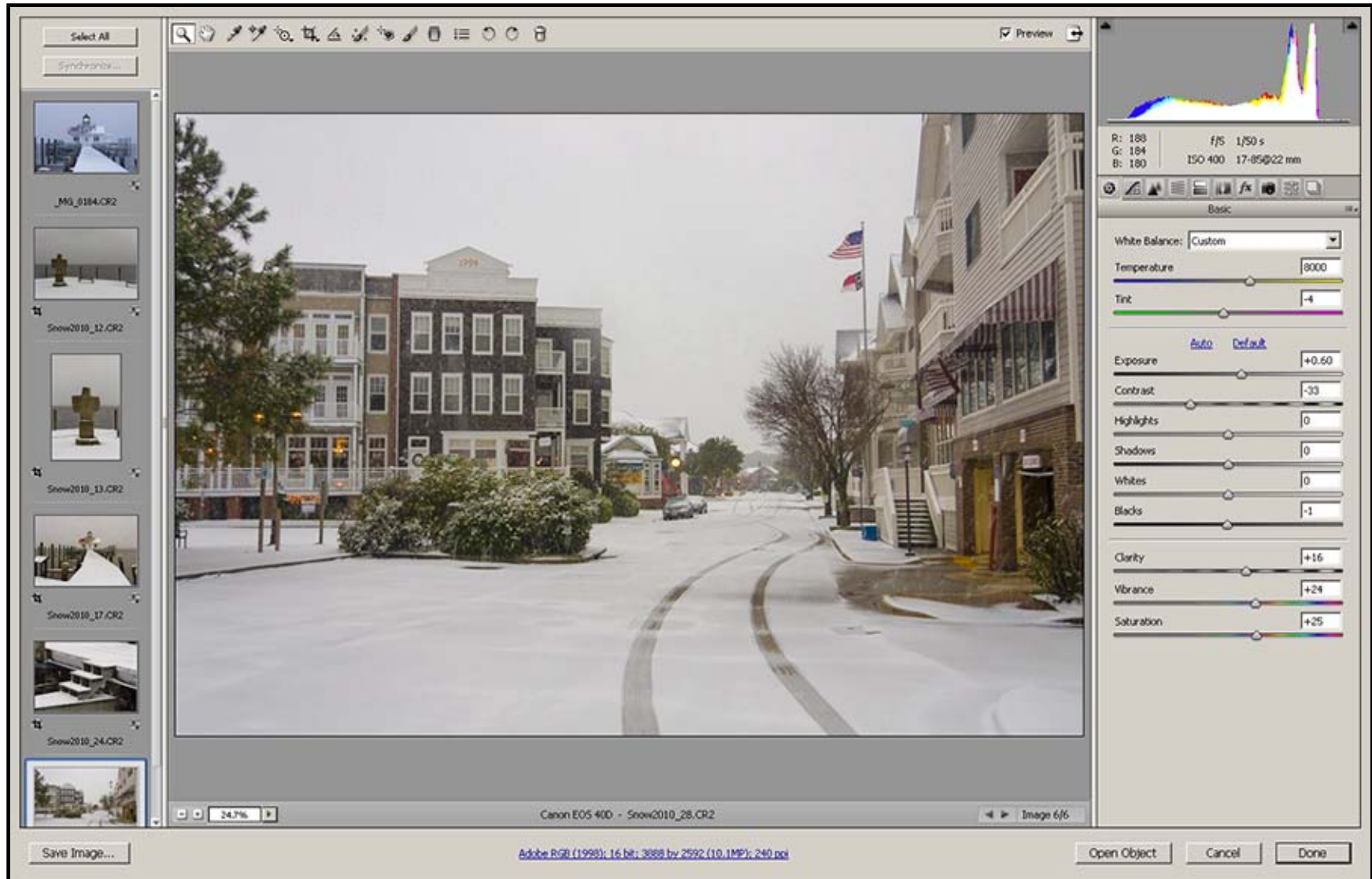


In the middle of the bottom is a link to the Workflow Options window. This allows you to select color space and bit depth.



With some files there are crop options which are actually re-sizing options. You can also set the ppi resolution and turn auto sharpening on or off and set the level and type of sharpening based on display purposes.

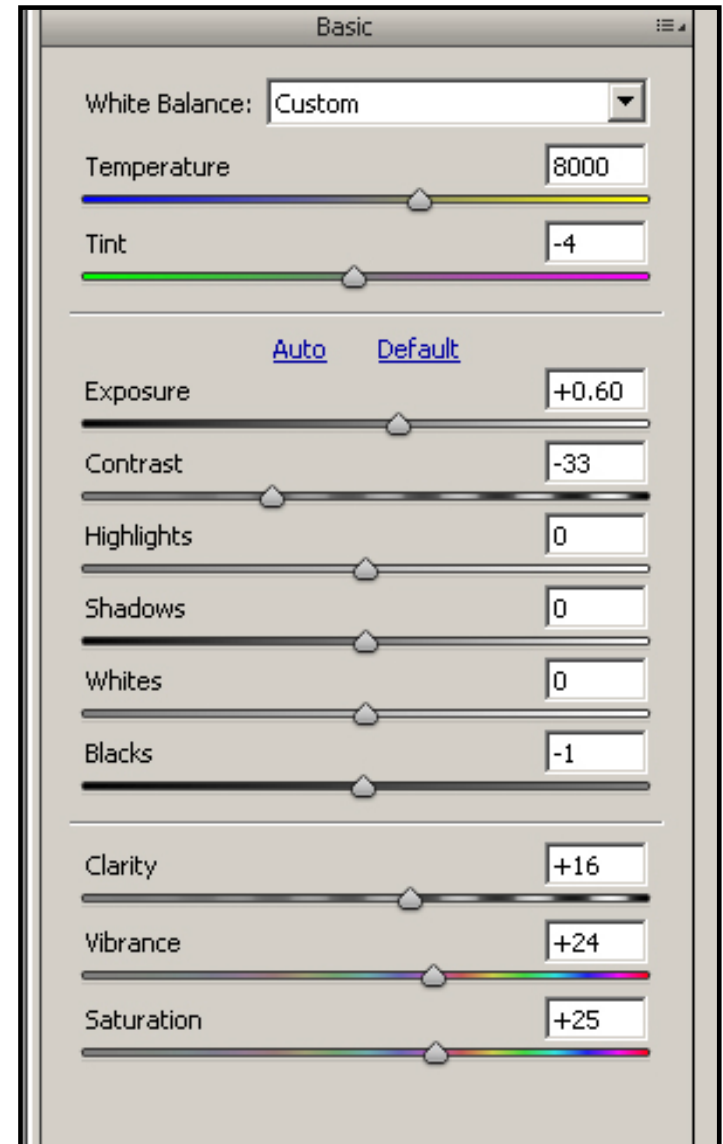
# Camera Raw 7 (Photoshop CS6)



The layout for ACR7 in Photoshop CS6 and Lightroom 4 is similar to what you get in Photoshop CS5 and Camera Raw 6

# Camera Raw 7 (Photoshop CS6)

The biggest difference going from CS5 to CS6 is that the Highlight Recovery slider has been replaced with sliders for Highlights and Shadows, giving us more precise controls without having to access the curves tab. Also the sliders are all “zero-centric” giving us both positive and negative aspects for each control. Yay!



# A shot in the dark...

This week, go find a place or situation where you would normally use a flash, and challenge yourself to shoot without it.

1. A stage show (where photography is permitted)
2. Inside a church
3. Inside a restaurant
4. The soundside shortly after sunset

Find someplace not-so-well-lit; turn off the flash; crank up your ISO; grab your tripod and your fastest lens; and make pretty pictures!

Shoot Raw files, then edit them.

If you need help, I'm just an email or phone call away.

[info@gartmanmbeachpix.com](mailto:info@gartmanmbeachpix.com) or 252-573-8648