

In Camera

The Newsletter of the Hawkesbury Camera Club Inc.

FROM THE CHAIR

Greetings Members,

It's hard to believe that another month has passed already, I think that there is so much always happening that is photography related (or it could be photography related if you want it to be) that the time passes so quickly. The next competition is just around the corner so a little planning and thought doesn't go astray. This past month started with a presentation from Brent Pearson. What a fantastic way to start the month. Brent was not only very knowledgeable but full of enthusiasm which is very refreshing to see and experience. It could never be said that Brent is set in his ways or of being one dimensional, He left us with the very strong impression that the next time we talk to Brent he will be doing something very different again. He is also very open and giving of his knowledge, which is something, I admire very much.

The second Wednesday HAG'S night was a presentation by Peter Gunzy on HDR. HDR seems to be the in thing at the moment and everyone you talk to wants' to know more about it For those that don't know what HDR is it stands for high dynamic range which is the difference in light shades between black and white or the dark areas of an image and the very light areas of the same image. Peter has accumulated a very extensive knowledge on HDR and he was able to show us a few very valuable lessons on how it all works. The second Wednesday group is still small in numbers but big on useful information. I recommend it to all those want to take the mystery out of Photoshop.

Our comp last month was another set subject (Transport), which was judged by Jim Crew. Jim is one of the more experienced judges going around and I



OFFICE BEARERS

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This Month

- Oct 6** AGM / Iconic Hawkesbury Images (Gift to Richmond Club)
- Oct 13** HAGS at the Richmond Club
- Oct 20** Competition – Open
- Oct 21** Garden Competition Presentation Night

think he did a great job. What a relief after the controversy surrounding some of recent judges. Alan Aldrich has asked Jim to do a presentation at a future HAG'S night so that would definitely be a night not to be missed.

The good reputation of our photographic club seems to attract interest from many different organisations and community groups which is very gratifying. At this very moment we have been asked to photograph the Model T Ford car club annual rally, a triathlon around Windsor and of course the Hawkesbury Garden Competition. These events are all on in September so I can just imagine all the fantastic images at our next comp in October, which is an open, comp of course.

The AGM is just around the corner so if you would like to become a little more involved in this fantastic club why not put your hand up for a position on the committee, it's always good to have new blood in any organisation and it's not hard at all. The AGM is also a good time to put forward any suggestions that you think will improve how we do things.

On the night of the AGM we will also be judging entries for Iconic Hawkesbury. The image judged to be the best by the members will be presented to The Hawkesbury Club as a token of our appreciation for all that they do for us.

The AV challenge entries are due now so if you would like to submit an entry please bring it along to our next meeting. We need 10 images to represent our club.

Cheers Geoff

The Annual General Meeting on Wednesday means some of our office bearers have to retire as their 3 years service is up. The continuing future of the club means we need members to offer their services to fill these positions. This year we luckily have a president who has stamped his mark on the club continuing the social friendly nature that is one of the hallmarks of the Hawkesbury Camera Club Inc. However the secretary, vice president and treasurers have decided to retire as so must be replaced. We appreciate the efforts the incumbents have made to the club but need other members to replace them.

This year has been another successful year for the club, we are about to publish a calendar based on last years Photos for the Kids ward photos, we gratefully acknowledge the assistance of the Windsor Rotary Club who have provided the money to publish it. The calendar will be donated to the Hawkesbury Hospital to aid the kids' ward. The last one we did was very popular and successful.

The Hospital again benefitted from our yearly donation of photos for the kids' ward, with the Community Health Department taking the additional 6 framed photos we donated along with the usual 12 for the kids' ward.

This year the club's program has been increased with our meeting on the second Wednesday of each month dedicated to digital photography, we have had many members contribute to these monthly interchanges of ideas and techniques. We will continue these meeting next year. Perhaps the highlight was the visit of John Swainston who presented a vision of the future by looking at the past history of photography.

This year the club has continued on it's stable financial path with the annual Garden Competition providing the club with those little pieces of expenditure other clubs struggle for. members who took part in this recent activity have the gratitude of all members who enjoy the benefits of their labours. With most of the garden photographs now in, I would like to congratulate all members who have taken part in the week. The standard of photography is once again excellent.

Members are reminded that the presentation evening will be held on October 21th at the Richmond Club starting at 7pm. Please help to make the evening a success by attending, there is always something you can do to assist. So make it an evening and have tea before hand, there is a

chance you will pick up a lucky door prize.

The club must thank all members who have contributed to it's successful year, we must thank those members such as the team who set up the display stands, laptop computer, digital projector. The addition of the Club's Colour-Munki has greatly improved the quality of the digital projection competition. We must thank Charles for his services to members who have used the instrument to calibrate their own computers. His correction to the club's laptop is obvious but the time he has spent with individual members is greatly appreciated.

(AA)



Hawkesbury Camera Club Inc

Invite you to its

End of Year Dinner

To be held on

Friday 3rd December 2010

6.30pm for 7pm

at the Richmond Club

**\$38 per person
RSVP - Charles**

(3 courses)

We will discuss the menu at the next club meeting as we have options.

From The Competitions Dept.

Hi Everyone,

As you know we have a few things coming up within the club.

For our next meeting on Wed 6th October along with the AGM we are picking one photo to give to the Richmond Club as a thank you from our club. The topic for this photo is "iconic Hawkesbury".

As such if you would like one of your photos to be selected for this please bring along an 8x10 print on the night, maximum no of entries is 2. All club members present on the night will assist in picking the winning photo. This will then be enlarged, framed and presented to the Richmond Club.

ALSO

We have the AV club challenge happening again this year. For those of you who may not remember for this we need to submit 10 photos of any topic. Our 10 photos are put along with photos from Castle Hill and Blacktown Clubs to make 30. With the 30 photos each club is then assigned the task of creating an AV (audio visual) presentation using all 30 random photos to create a story. These photos may be manipulated to create the story.

If you have a photo that you would like considered by the committee for this, please email it to Kim ASAP at kim@aquaticvista.com The committee will pick the 10 photos on Wednesday 6th October before the AGM so please send me your entries by Wednesday 6pm. You can enter up to 4 photos for this.

If you are not sure about any of the above, please just give me a call on 0410 571107 or email me: kim@aquaticvista.com

Cheers

Kim Duproy

Competition Manager.

Next Month

NOV 3 Photos for Childrens' Ward of Hawkesbury Hospital

NOV 17 Comp – End of Year

Reflections from Josephine

I became a tourist with a camera last month and ventured to the sunny state with my Mum, armed with my compact camera. Even though the camera had obvious limitations I was able to capture some scenes for the sake of a memory, and knowing my way around its menus and options made the best of it. In the airplane I was sitting next to the window so adjusted the white balance to "cloudy" in order to take photos of the clouds from the ceiling of the sky. I used the +/- exposure compensation to make the sky darker, thus increasing the contrast with the clouds. The crisp photos of fluffy clouds distracted me from the fact that I was so far above terra firma. While walking along the beach and enjoying the sunset that afternoon, I wanted to capture the brilliant sky and full expanse of the white sand, so I taxed my camera to the limits of its "wide angle" possibility, and once again adjusted the contrast in the landscape setting. No photograph can convey the fresh breeze and communion with nature, but it can remind me of it. On another day we went to Sea World and watched the Dolphin Show from afar. I selected the "Sports" option in order to catch the dolphins mid air. With the bright sunshine on the back screen of the camera I wasn't sure till I found a bit of shade to see whether I had indeed caught them, but sure enough, there they were, twisting in mid air, streams of water cascading from their suspended bodies. Along the walkway were various statues of sea world themes, such as a dolphin and a walrus. With my Mum next to the walrus and me next to the dolphin, the typical tourist photos were realized. While waiting for the Whale Watch boat I admired the huge photo of a whale tail on the wall of the foyer, so I stood back and took a photo of the photo, just in case I didn't manage such a spectacular shot out on the water! Careful cropping of the scene made it look like it was really my photo, but we all know it wasn't. Out on the water it was awesome to see the whales with a few humpbacks surfacing, and an occasional tail slash, and the typical "footprints" left behind, just meters from our boat. Poor timing and an expired battery meant I missed a photo of the tails that waved us goodbye as we headed back to dock. On a trip to Mount Tamborine I took photos of the edge of a rainforest, a wide-angle view from a lookout, and some lovely gardens. We went to a



Bowral was enjoyable, though very wet! So many flowers. Perfect lighting for garden photography, no need for a spray bottle of water! Josephine

concert one night and I managed a few photos of the performers, but it wasn't about taking photos, it was about enjoying the experiences. I decided to do some research at the Grandpa's Old Time Photos shop, and convinced my Mum that it would be fun for us to play dress-ups as Victorian ladies, and have our photos taken. It was fun, and we now have the souvenir photos of the moment. From the hotel balcony there was a lovely view at night, lights shining from streetlights and other hotel windows – I selected the "night landscape" from the camera menu and tried to steady the camera as well as I could without a tripod. The camera did reasonably well, and I have some more images that might end up being translated to paintings. The holiday was about having a holiday, not a photographic quest, the photos would just be a reminder of the enjoyable holiday with my Mum.

On another note, I am preparing my

Shining Exhibition, due to open on Saturday 23rd October at 3pm. Everyone is welcome to attend, if you can't make it on the day, please call in at Blue Gallery another time. The paintings are a series with a gold/silver theme, many of which began as photographs and in which I saw in my mind's eye, paintings, interpreting them through mixed media with enamel paint, inks, watercolour, oil pastel and other paint to create the effect I wanted. The subjects range over landscapes, birds, gardens, plants, seascapes, cityscapes, machinery and figures, and many were taken on Camera Club outings to places like Featherdale Wildlife Park and Cockatoo Island. Some are images from the Hawkesbury.

Josephine Blue

Hawkesbury Camera Club Members at the Protest Rally.



HDR: HIGH DYNAMIC RANGE PHOTOGRAPHY

High dynamic range (HDR) images enable photographers to record a greater range of tonal detail than a given camera could capture in a single photo. This opens up a whole new set of lighting possibilities, which one might have previously avoided—for purely technical reasons. The new "merge to HDR" feature of Photoshop allows the photographer to combine a series of bracketed exposures into a single image, which encompasses the tonal detail of the entire series. There is no free lunch however; trying to broaden the tonal range will inevitably come at the expense of decreased contrast in some tones. Learning to use the merge to HDR feature in Photoshop can help you make the most of your dynamic range under tricky lighting—while still balancing this trade-off with contrast.

MOTIVATION: THE DYNAMIC RANGE DILEMMA

As digital sensors attain progressively higher resolutions, and thereby successively smaller pixel sizes, the one quality of an image, which does not benefit is its dynamic range. This is particularly apparent in compact cameras with resolutions near 8 megapixels, as these are more susceptible than ever to blown highlights or noisy shadow detail. Further, some scenes simply contain a greater brightness range than can be captured by current digital cameras-- of any type.

The "bright side" is that nearly any camera can actually capture a vast dynamic range-- just not in a single photo. By varying the shutter speed alone, most digital cameras can change how much light they let in by a factor of 50,000 or more. High dynamic range imaging attempts to utilize this characteristic by creating images composed of multiple exposures, which can far surpass the dynamic range of a single exposure.

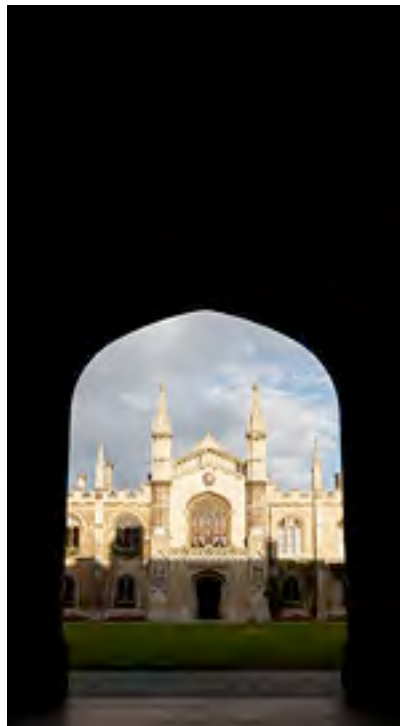
WHEN TO USE HDR IMAGES

The suggestion is to only use HDR images when the scene's brightness distribution can no longer be easily blended using a graduated neutral density (GND) filter. This is because GND filters extend dynamic range while still maintaining local contrast. Scenes which are ideally suited for GND filters are those with simple lighting geometries, such as the linear blend from dark to light encountered commonly in landscape photography (corresponding to the relatively dark land transitioning into bright sky).

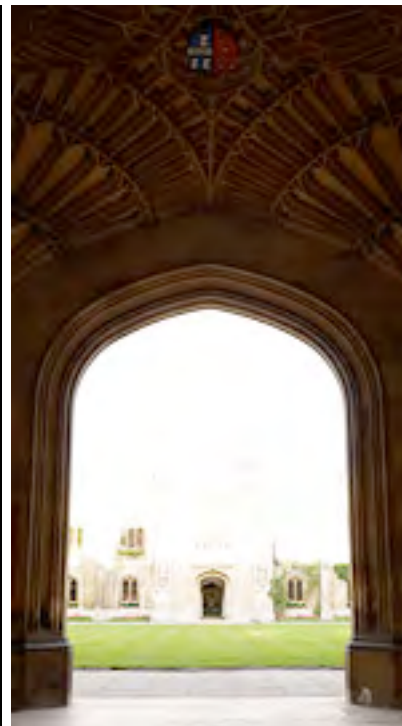
In contrast, a scene whose brightness distribution is no longer easily blended using a GND filter is the doorway scene shown below.



Brightness Distribution



Underexposure



Overexposure

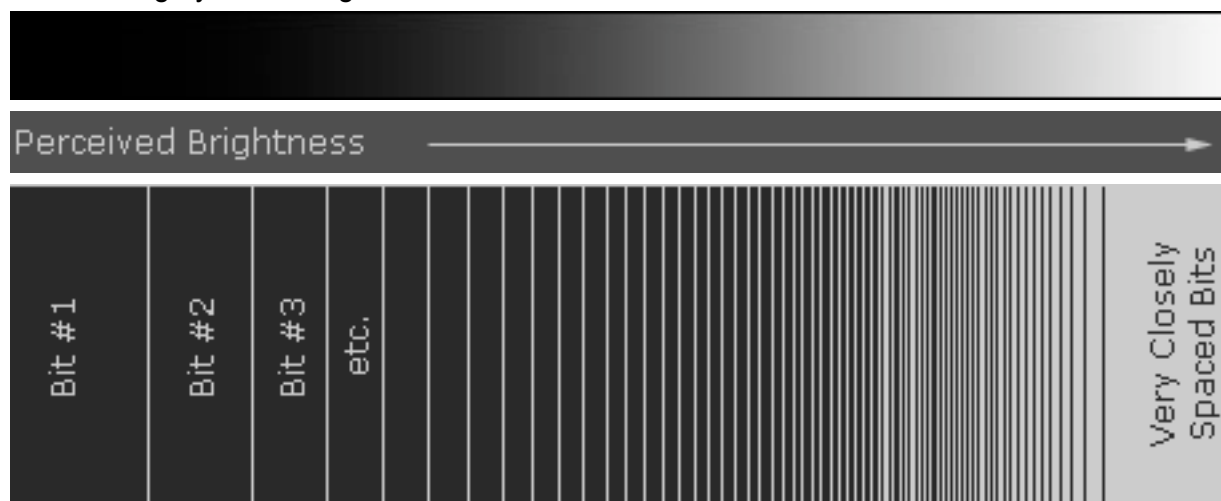
Note that the above scene contains roughly three tonal regions with abrupt transitions at their edges-- therefore requiring a custom-made GND filter. If we were to look at this in person, we would be able to discern detail both inside and outside the doorway, because our eyes would adjust to changing brightness. The goal of HDR use in this article is to better approximate what we would see with our own eyes through the use of a technique called tonal mapping.

INNER WORKINGS OF AN HDR FILE

Photoshop creates an HDR file by using the EXIF information from each of your bracketed images to determine their shutter speed, aperture and ISO settings. It then uses this information to assess how much light came from each image region. Since this light may vary greatly in its intensity, Photoshop creates the HDR file using 32-bits to describe each colour channel (as opposed to the usual 16 or 8-bits, as discussed in the tutorial on "Understanding Bit Depth"). The real benefit is that HDR files use these extra bits to create a relatively open-ended brightness scale, which can adjust to fit the needs of your image. The important distinction is that these extra bits are used differently than the extra bits in 16-bit images, which instead just define tones more. The usual 8 and 16-bit files are low dynamic range (LDR) images, relatively speaking.

The 32-bit HDR file format describes a greater dynamic range by using its bits to specify floating point numbers, also referred to as exponential notation. A floating-point number is composed of a decimal number between 1 and 10 multiplied by some power of 10, such as 5.467×10^3 , as opposed to the usual 0-255 (for 8-bit) or 0-65535 (for 16-bit) integer colour specifications. This way, an image file can specify a brightness of 4,300,000,000 simply as 4.3×10^9 , which would be too large even with 32-bit integers.

We see that the floating-point notation certainly looks neater and more concise, but how does this help a computer? Why not just keep adding more bits to specify successively larger numbers, and therefore a larger dynamic range? Recall that for ordinary LDR files, far more bits are used to distinguish lighter tones than darker tones (from the tutorial on gamma correction, tonal levels and exposure - to be added). As a result, as more bits are added, an exponentially greater fraction of these bits are used to specify color more precisely, instead of extending dynamic range.



Representation of How Bits Are Allocated for Increasing Brightness

Note: Above representation is qualitative, and depends on other factors such as screen bit depth, monitor gamma, etc. The more closely spaced bits for brighter values is a result of the fact that ordinary 8 and 16-bit JPEG files are gamma-encoded, which can actually help increase dynamic range for low-bit files; gamma-encoding just becomes more and more inefficient as the bit depth increases.

HDR files get around this LDR dilemma of diminishing returns by using floating point numbers which are proportional to the actual brightness values of the subject matter (gamma equals one, or linear). This ensures that bits are equally spaced throughout the dynamic

range, and not just concentrated in the brighter tones-- allowing for greater bit efficiency. Further, the use of floating point numbers ensure that all tones are recorded with the same relative precision, since numbers such as 2.576×10^3 and 8.924×10^9 each have the same number of significant figures (four), even though the second number is more than a million times larger.

Note: just as how using high bit depth images do not necessarily mean your image contains more colour, a high dynamic range file does not guarantee greater dynamic range unless this is also present in the actual subject matter.

All of these extra bits provided by the HDR format are great, and effectively allow for a nearly infinite brightness range to be described. The problem is that your computer display (or the final photographic print) can only show a fixed brightness scale. This tutorial therefore focuses on how to create and convert HDR files into an ordinary 8 or 16-bit image, which can be displayed on a monitor, or will look great as a photographic print. This process is also commonly referred to as tonal mapping.

IN-CAMERA PREPARATION

Since creating a HDR image requires capturing a series of identically positioned exposures, a sturdy tripod is essential. Photoshop has a feature, which attempts to align the images when the camera may have moved between shots, however best results are achieved when this is not relied upon.

Make sure to take at least three exposures, although five or more is recommended for optimum accuracy. More exposures allow the HDR algorithm to better approximate how your camera translates light into digital values (aka. the digital sensor's response curve)-- creating a more even tonal distribution. The doorway example is best suited with several intermediate exposures, in addition to the two shown previously.



Reference

-1 Stops

-2 Stops

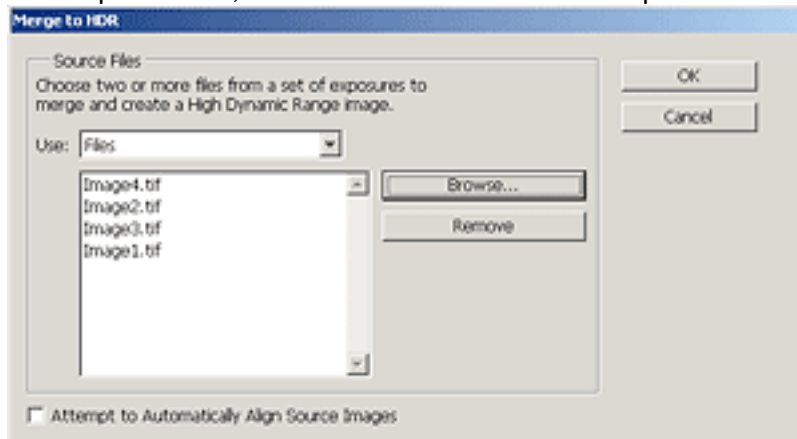
-3 Stops

It is essential that the darkest of these exposures include no blown highlights in areas where you want to capture detail. The brightest exposure should show the darkest regions of the image with enough brightness that they are relatively noise-free and clearly visible. Each exposure should be separated by one to two stops, and these are ideally set by varying the shutter speed (as opposed to aperture or ISO speed). Recall that each "stop" refers to a doubling (+1 stop) or halving (-1 stop) of the light captured from an exposure.

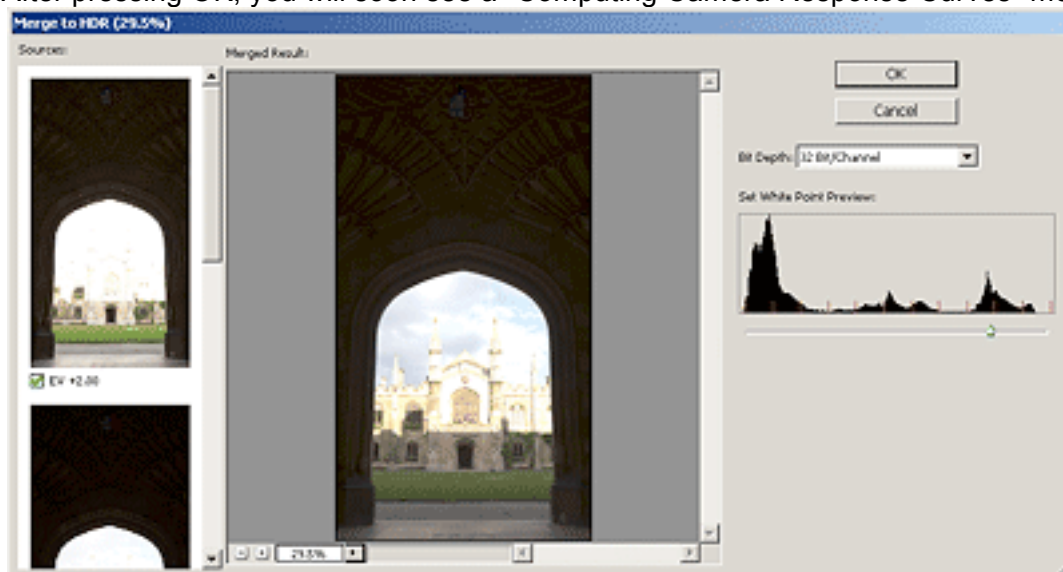
We also note another disadvantage of HDR images: they require relatively static subject matter, due to the necessity of several separate exposures. Our previous ocean sunset example would therefore not be well-suited for the HDR technique, as the waves would have moved significantly between each exposure.

CREATING A 32-BIT HDR FILE IN PHOTOSHOP

Adobe Photoshop is used to convert the sequence of exposures into a single image, which uses tonal mapping to approximate what we would see with our eye. Before tonal mapping can be performed, we first need to combine all exposures into a single 32-bit HDR file.



Open the HDR tool (File>Automate>Merge to HDR), and load all photographs in the exposure sequence; for this example it would be the four images shown in the previous section. If your images were not taken on a stable tripod, this step may require checking "Attempt to Automatically Align Source Images" (which greatly increases processing time). After pressing OK, you will soon see a "Computing Camera Response Curves" message.



Once the computer has stopped processing, it will show a window with their combined histogram. Photoshop has estimated the white point, but this value often clips the highlights. You may wish to move the white point slider to the rightmost edge of the histogram peaks in order to see all highlight detail. This value is for preview purposes only and will require setting more precisely later. After pressing OK, this leaves you with a 32-bit HDR image, which can now be saved if required. Note how the image may still appear quite dark; only once it has been converted into a 16 or 8-bit image (using tonal mapping) will it begin to look more like the desired result.

At this stage, very few image processing functions can be applied to a 32-bit HDR file, so it is of little use other than for archival purposes. One function, which is available, is exposure adjustment (Image>Adjustments>Exposure). You may wish to try increasing the exposure to see any hidden shadow detail, or decreasing the exposure to see any hidden highlight detail.

USING HDR TONAL MAPPING IN PHOTOSHOP

Here we use Adobe Photoshop to convert the 32-bit HDR image into a 16 or 8-bit LDR file using tonal mapping. This requires interpretive decisions about the type of tonal mapping, depending on the subject matter and brightness distribution within the photograph.

Convert into a regular 16-bit image (Image>Mode>16 Bits/Channel) and you will see the HDR Conversion tool. The tonal mapping method can be chosen from one of four options, described below.

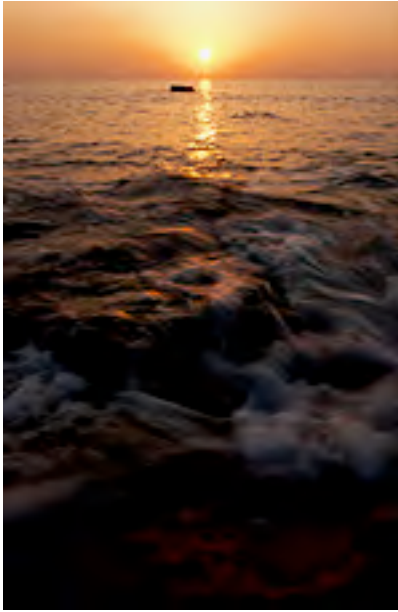
Exposure and Gamma	This method lets you manually adjust the exposure and gamma, which serve as the equivalent to brightness and contrast adjustment, respectively.
Highlight Compression	This method has no options and applies a custom tonal curve, which greatly reduces highlight contrast in order to brighten and restore contrast in the rest of the image.
Equalize Histogram	This method attempts to redistribute the HDR histogram into the contrast range of a normal 16 or 8-bit image. This uses a custom tonal curve, which spreads out histogram peaks so that the histogram becomes more homogenous. It generally works best for image histograms, which have several relatively narrow peaks with no pixels in between.
Local Adaptation	This is the most flexible method and probably the one, which is of most use to photographers. Unlike the other three methods, this one changes how much it brightens or darkens regions on a per-pixel basis (similar to local contrast enhancement). This has the effect of tricking the eye into thinking that the image has more contrast, which is often critical in contrast-deprived HDR images. This method also allows changing the tonal curve to better suit the image.

Before using any of the above methods, one may first wish to set the black and white points on the image histogram sliders (see "Using Levels in Photoshop" for a background on this concept). Click on the double arrow next to "Toning Curve and Histogram" to show the image histogram and sliders.

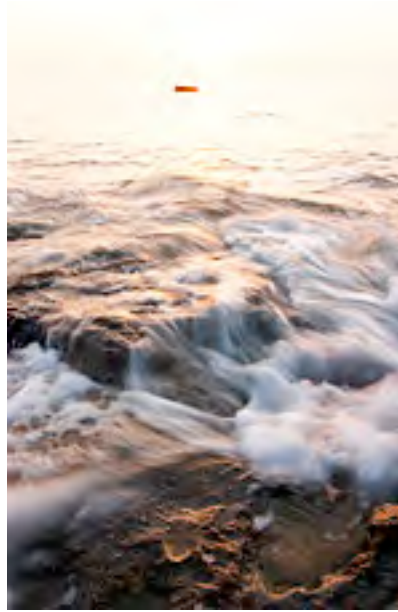
The remainder of this tutorial focuses on settings related to the "local adaptation" method, as this is likely the most-used, and provides the greatest degree of flexibility.

CONCEPT: TONAL HIERARCHY & IMAGE CONTRAST

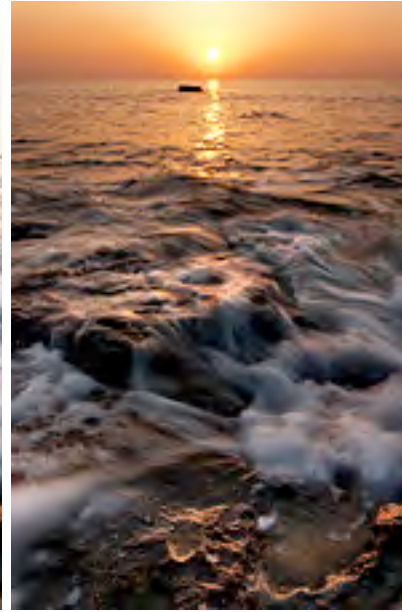
In contrast to the other three conversion methods, the local adaptation method does not necessarily retain the overall hierarchy of tones. It translates pixel intensities not just with a single tonal curve, but instead also based on the surrounding pixel values. This means that unlike using a tonal curve, tones on the histogram are not just stretched and compressed, but may instead cross positions. Visually, this would mean that some part of the subject matter which was initially darker than some other part could later acquire the same brightness or become lighter than that other part-- if even by a small amount.



Underexposed Photo



Overexposed Photo



Final Composite that Violates Large-Scale Tonal Hierarchy

A clear example where global tonal hierarchy is not violated is the example used in the page on using a GND to extend dynamic range (although this is not how local adaptation works). In this example, even though the foreground sea foam and rock reflections are actually darker than the distant ocean surface, the final image renders the distant ocean as being darker. The key concept here is that over larger image regions our eyes adjust to changing brightness (such as looking up at a bright sky), while over smaller distances our eyes do not. Mimicking this characteristic of vision can be thought of as a goal of the local adaptive method-- particularly for brightness distributions that are more complex than the simple vertical blend in the ocean sunset above.

An example of a more complex brightness distribution is shown below for three statue images. We refer to contrast over larger image distances as global contrast; whereas contrast changes over smaller image distances are termed local contrast. The local adaptation method attempts to maintain local contrast, while decreasing global contrast (similar to that performed with the ocean sunset example).



Original Image



High Global Contrast
Low Local Contrast



Low Global Contrast
High Local Contrast

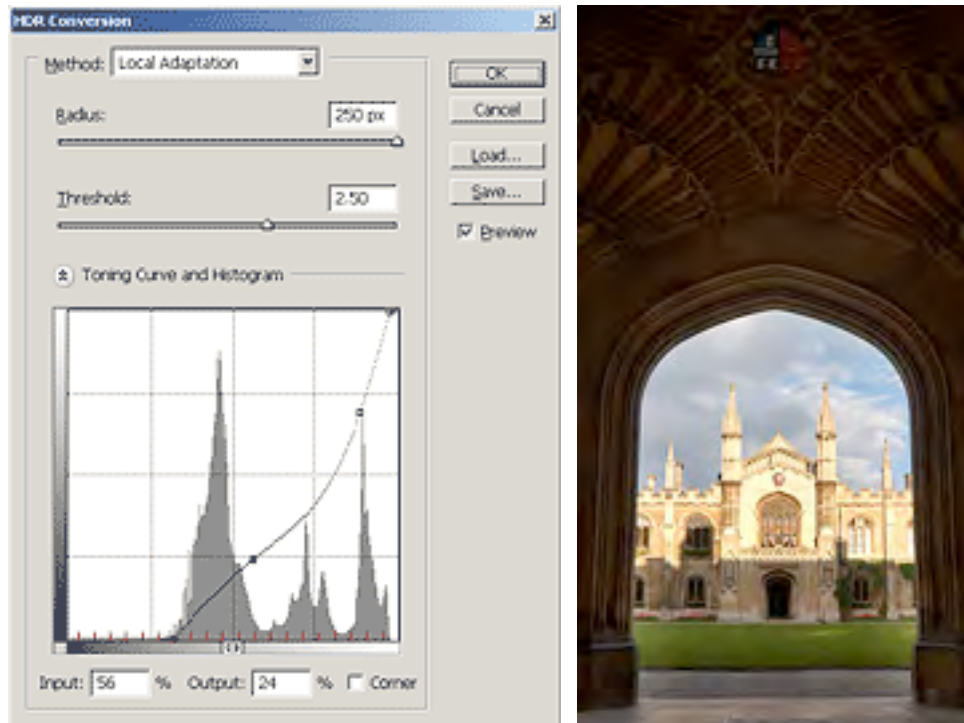
The above example illustrates visually how local and global contrast impact an image. Note how the large-scale (global) patches of light and dark are exaggerated for the case of high global contrast. Conversely, for the case of low global contrast the front of the statue's face is virtually the same brightness as it's side.

The original image looks fine since all tonal regions are clearly visible, and shown with sufficient contrast to give it a three-dimensional appearance. Now imagine that we started with the middle image, which would be an ideal candidate for HDR conversion. Tonal mapping using local adaptation would likely produce an image similar to the far right image (although perhaps not as exaggerated), since it retains local contrast while still decreasing global contrast (thereby retaining texture in the darkest and lightest regions).

HDR CONVERSION USING LOCAL ADAPTATION

The distance that distinguishes between local and global contrast is set using the radius value. Radius and threshold are similar to the settings for an unsharp mask used for local contrast enhancement. A high threshold improves local contrast, but also risks inducing halo artefacts, whereas too low of a radius can make the image appear washed out. For any given image, it is recommended to adjust each of these to see their effect, since their ideal combination varies depending on image content.

In addition to the radius and threshold values, images almost always require adjustments to the tonal curve. This technique is identical to that described in the Photoshop curves tutorial, where small and gradual changes in the curve's slope are nearly always ideal. This curve is shown for our doorway example below, yielding the final result.



Photoshop CS2 Tool

Final Result
Using Local Adaptation Method

HDR images which have been converted into 8 or 16-bit often require touching up in order to improve their colour accuracy. Subtle use of levels and saturation can drastically improve problem areas in the image. In general, regions that have increased in contrast (a large slope in the tonal curve) will exhibit an increase in colour saturation, whereas the opposite occurs for a decrease in contrast. Changes in saturation may sometimes be desirable when brightening shadows, but in most other instances this should be avoided.

The main problem with the local adaptation method is that it cannot distinguish between incident and reflected light. As a result, it may unnecessarily darken naturally white textures and brighten darker ones. Be aware of this when choosing the radius and threshold settings so that this effect can be minimised.

TIP: USING HDR TO REDUCE SHADOW NOISE

Even if your scene does not require more dynamic range, your final photo may still improve from a side benefit: decreased shadow noise. Ever noticed how digital images always have

more noise in the shadows than in brighter tones? This is because the image's signal to noise ratio is higher where the image has collected more of a light signal. You can take advantage of this by combining a properly exposed image with one, which has been overexposed. Photoshop always uses the most exposed image to represent a given tone—thereby collecting more light in the shadow detail (but without overexposing).

RECOMMENDATIONS

Keep in mind that HDR images are extremely new-- particularly in the field of digital photography. Existing tools are therefore likely to improve significantly; there is not currently, and may never be, an automated single-step process which converts all HDR images into those which look pleasing on screen, or in a print. Good HDR conversions therefore require significant work and experimentation in order to achieve realistic and pleasing final images.

Additionally, incorrectly converted or problematic HDR images may appear washed out after conversion. While re-investigating the conversion settings is recommended as the first corrective step, touch-up with local contrast enhancement may also yield a more pleasing result.

As with all new tools, be careful not to overdo their use. Use care when violating the images original tonal hierarchy; do not expect deep shadows to become nearly as light as a bright sky. In our doorway example, the sunlit building and sky are the brightest objects, and they stayed that way in our final image. Overdoing editing during HDR conversion easily can cause the image to lose its sense of realism. Furthermore, HDR should only be used when necessary; best results can always be achieved by having good lighting to begin with.