Image Projection

Optimizing Your Images for the Canon Realis SX80 Projector

From Acceptable to Optimal

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Agenda

- What matters and what doesn’t
- Preparing your images for projection
- Checklist for members
- Checklist for organization

What Does and Does Not Matter

What Matters

- Image's dimension in pixels
- Color space
- File format
- Bit depth
- Gamma

What (kinda) Does Not Matter

- File Size (i.e. KB, MB)
- File resolution (pixels per inch)

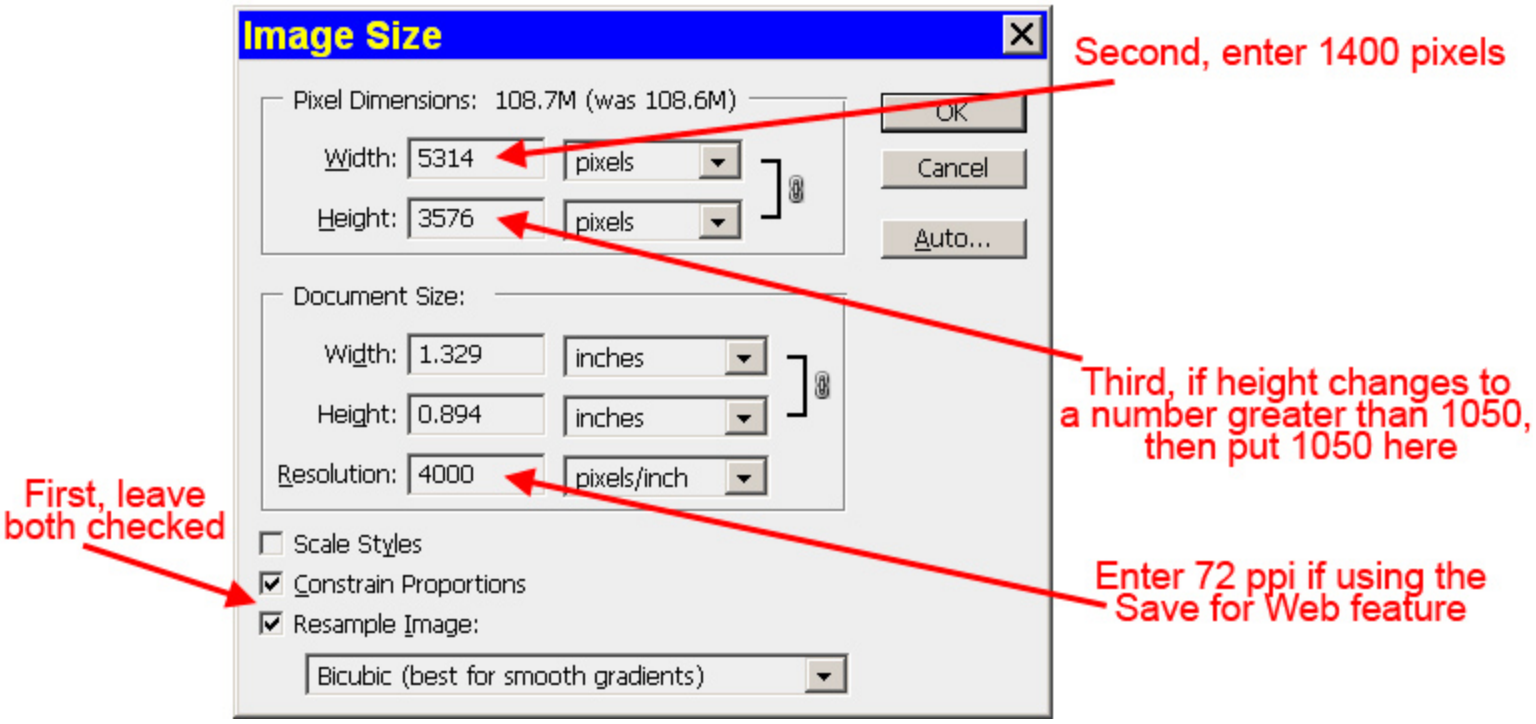
Image Dimension in Pixels

The Canon Realis SX80 has a native resolution of 1400 x 1050 pixels. Therefore, your image should have a width that does not exceed 1400 pixels and a height that does not exceed 1050 pixels.

This does NOT mean your image must be exactly 1400x1050. If your image has a portrait orientation, height is the longest side and should not exceed 1050. If the image has a landscape orientation, then width is the longest side and should not exceed 1400.

Photoshop's Image Resize

Caution: Do this on a copy of your original !



Color Space, File Format, Bit Depth

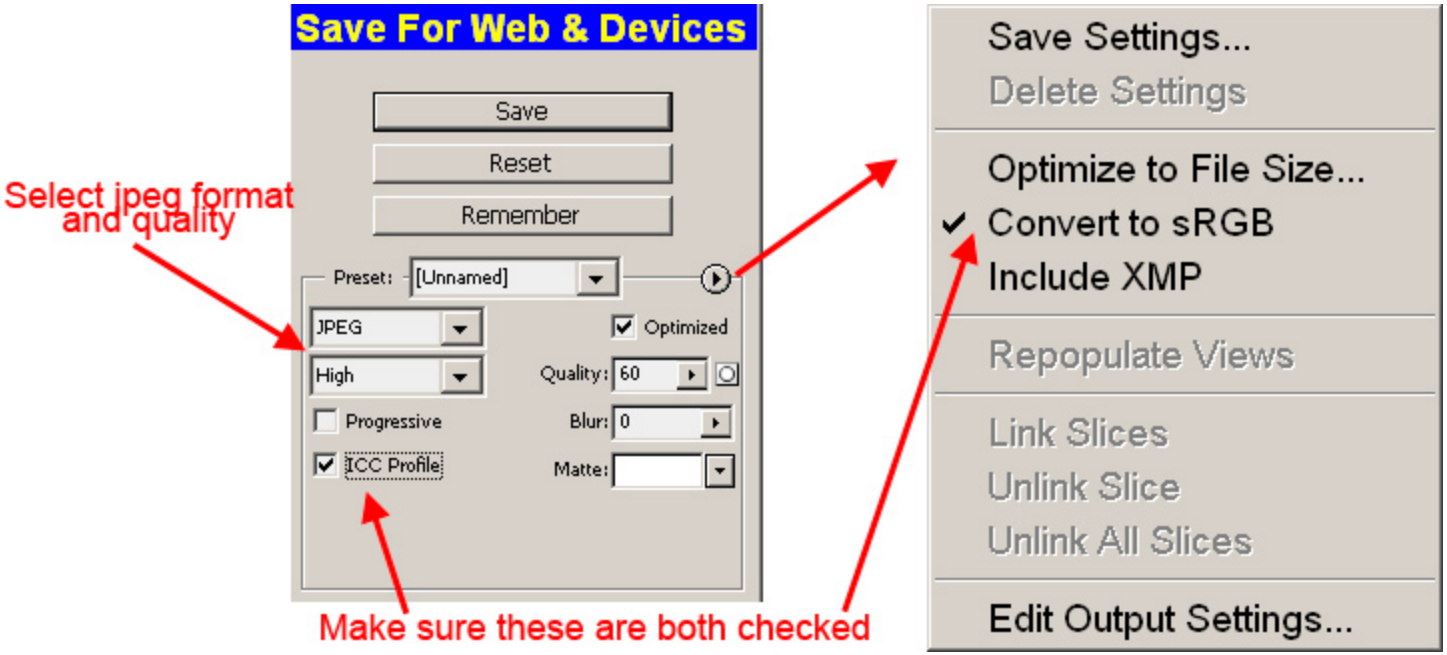
The Canon Realis SX80 has the following color modes: Standard, Presentation, Movie and sRGB. As photographers, we are interested in the sRGB mode.

File format and bit depth are more dependent on the software projecting the image.

- Projector color space: sRGB
- Image color space: sRGB
- File format: JPEG preferred. TIFF ok. Not Raw, not PSD, not bitmap. If emailing images to the presentation coordinator, JPEG is preferred. If you must use the TIF format, consider using LZW compression.
- Bit depth: 8 bpc (bits per channel)

Photoshop's Save for Web

Photoshop's Save for Web can flatten, convert to JPEG, sRGB and 8 bpc in one step.



Make sure ICC profile and Convert to sRGB are checked

Gamma

- Math review
- What is gamma
- Demystifying the Levels gamma slider
- When and how to correct for gamma

Math Review

$4^2 = 16$ 16 is greater than 4

$\frac{1}{2}^2 = \frac{1}{4}$ $\frac{1}{4}$ is less than $\frac{1}{2}$

When applying an exponent (greater than 1) to a fraction, such as ½ or 0.5, the resulting number is <u>smaller</u> than the base number.

What is Gamma?

Gamma is an adjustment factor used by computer systems when converting image pixel brightness to monitor pixel brightness.

Every image pixel has its own brightness value, which is an internal number from 0 to 1. A computer system takes the image pixel brightness values and converts them into brightness values for its monitor. The brightness at which pixels are displayed on a monitor is a nonlinear relationship between the input values and the output values called the brightness response curve. The response curve's formula is expressed as output brightness equals input brightness to the power of an adjustment factor. This adjustment factor is called gamma.

Monitor pixel brightness = Image pixel brightness ^ gamma

Gamma for Windows and Mac

Gamma is a constant for a computer system. The gamma values for the two common computer systems are **2.2 for Windows** based computers and **1.8 for Mac** computers.

Pop Quiz

Image pixel brightness is an internal value from 0 to 1 inclusive. Given 0.5 is mid tone, would an image with mostly mid tones that was optimized on a Mac computer appear brighter or darker on a Windows based computer? Hint, the respective formulas are

$$\text{Mac monitor pixel brightness} = 0.5^{1.8}$$

$$\text{Windows monitor pixel brightness} = 0.5^{2.2}$$

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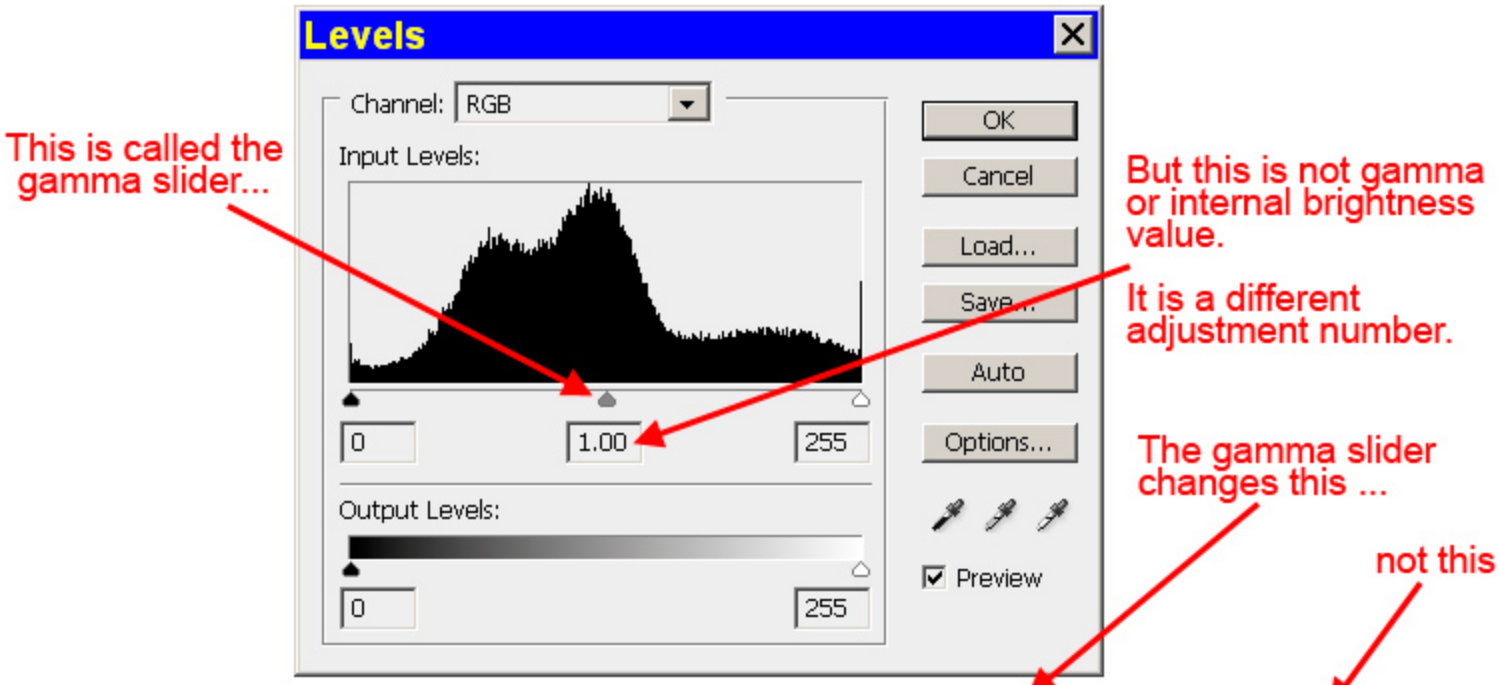
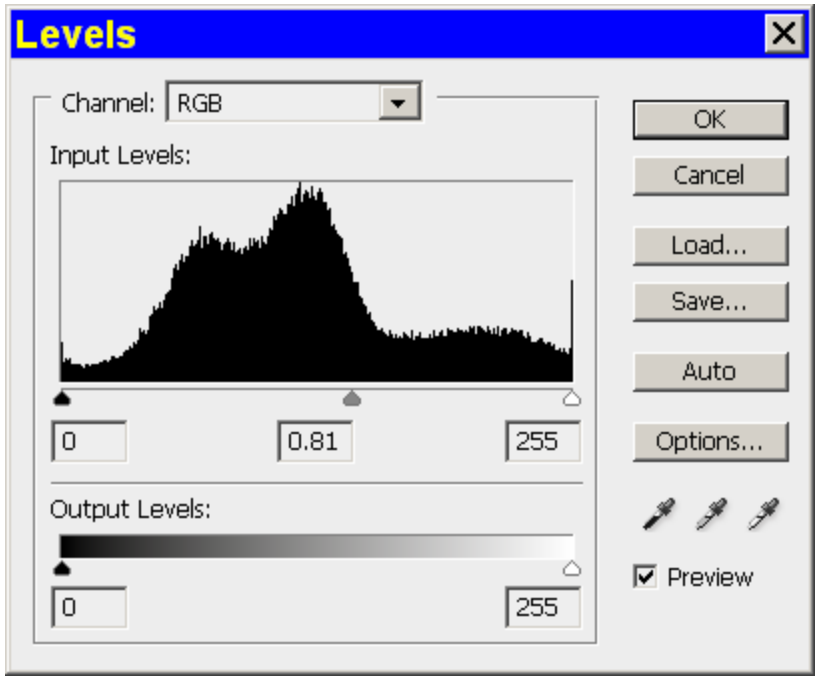
Answer: The image would appear darker because the higher the gamma value, the lower the output brightness value. 0.5 to the power of 1.8 equals 0.287. But 0.5 to the power of 2.2 equals 0.218.

Levels Adjustment Overview



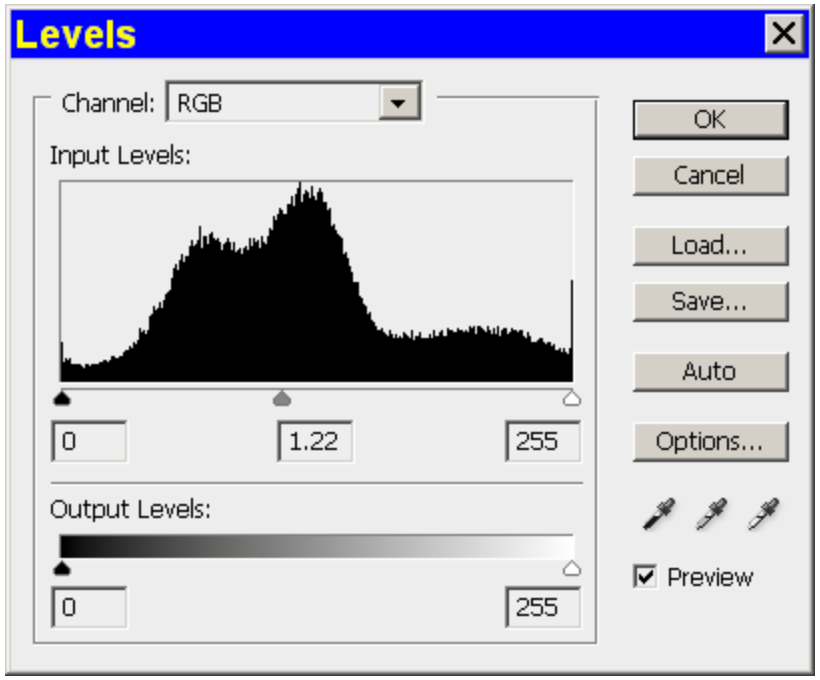
Windows to Mac Adjustment



If your image was optimized on a Windows based computer and it will be displayed on a Mac

Change the gamma slider value to 0.81

Mac to Windows Adjustment



If your image was optimized on a Mac computer and it will be displayed on a Windows based computer

Change the gamma slider value to 1.22

Gamma for Windows and Mac

Pop Quiz

True or False. A black and white photographer does not need to be concerned with gamma.

Gamma for Windows and Mac

Pop Quiz

True or False. A black and white photographer does not need to be concerned with gamma.

Answer: False. Gamma is about image brightness, not color. Light's three characteristics are hue, saturation and tone. A black and white photograph has neither hue nor saturation. It only has tone. Another word for tone is brightness.

Gamma for Windows and Mac

Pop Quiz

A Mac user should use what gamma value when printing their image?

Gamma for Windows and Mac

Pop Quiz

A Mac user should use what gamma value when printing their image?

Answer: None. Gamma is used to calculate monitor pixel brightness. It is immaterial when printing.

Checklist for Members

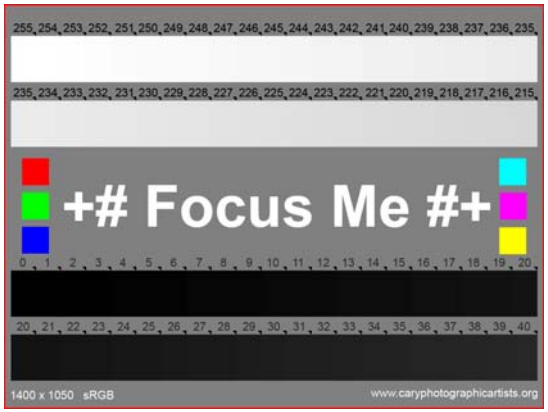
1. Make a copy of original image
2. Resize copy
   - Width: no more than 1400 pixels
   - Height: no more than 1050 pixels
   - File resolution: use 72 ppi if using the Save for Web feature
3. Use Levels gamma slider for adjustment
   - Win to Mac: 0.81
   - Mac to Win: 1.22
   - Win to Win: no adjustment
   - Mac to Mac: no adjustment
4. Save for Web feature
   - ICC profile: embedded
   - Color space: sRGB
   - File format: JPEG
   - Bit depth: 8 bits per channel
   - Flatten image (no layers, alpha channels, text annotations, etc.)
   - Follow naming standard: yourname-nn-xxx.jpg (ex. JDoe-01-sunset.jpg)
5. If bringing images to the meeting, use a USB drive or CD, not flash memory cards or diskette.

Homework for Members

- If unsure of any of the following concepts: ICC profile, color spaces, bit depth, file format, flattened image, etc. Then please ask for help.
- Know the difference between convert to profile and assign profile.
- Go buy a USB drive if you don’t already own one.

Checklist for Organization

- Use sRGB mode on projector
- Color calibrate equipment
- Use ‘slide show’ software so images are displayed full screen
- Use slide show software that recognizes embedded color profiles
- Inform members in advance which OS will be used for projection (Windows or Mac)
- At meeting, use target file to check contrast, brightness and viewing area.



End

Q&A