Making Prints

- Pixel requirements
- Autoadjustments vs. No Autoadjustments
- Media choices
  - Glossy, Luster, Matte, Metal
  - Aluminum
  - Plexiglass
- Labs
  - Costco
  - MpixPro
  - WHCC
  - Others
- Calibrating
- Mats
  - Matboards Plus
  - Sizing to fit the opening

Pixel Requirements

Digital camera resolution vs print quality

Capture Resolution	Video Display	Print Size						
		2x3"	4x5"/4x6"	5x7"	8x10"	11x14"	16x20"	20x30"
320x240	OK	Good	OK	Crap	Crap	Crap	Crap	Crap
640x480 0.3Megapixel	Good	Excellent	Good	Crap	Crap	Crap	Crap	Crap
800x600	Excellent	Photo Quality	Very Good	Reasonable	Crap	Crap	Crap	Crap
1024x768	Excellent	Photo Quality	Excellent	Good	OK	Crap	Crap	Crap
1280x960 1 MP	Excellent	Photo Quality	Photo Quality	Very Good	Good	Crap	Crap	Crap
1536x1180	Excellent	Photo Quality	Photo Quality	Excellent	Very Good	OK	Crap	Crap
1600x1200 2MP	Excellent	Photo Quality	Photo Quality	Photo Quality	Very Good	OK	OK	Crap
2048x1536 3 Megapixel	Excellent	Photo Quality	Photo Quality	Photo Quality	Excellent	Good	OK	OK
2240x1680 4 Megapixel	Excellent	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Very Good	Good	OK
2560x1920 5 Megapixel	Excellent	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Excellent	Very Good	Very Good
3032x2008 6 Megapixel	Excellent	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Excellent	Very Good
3072x2304 7 Megapixel	Excellent	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Excellent	Excellent
3264x2448 8 Megapixel	Excellent	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Excellent
10 Megapixel +	Excellent	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Photo Quality	Photo Quality

Rough Pixel Requirements in PPI

- Crap
  - Horribly pixelated blocky mess, like something out of 1987
  - < 90 ppi
- OK
  - Looks reasonable enough, but nowhere near photo quality
  - ~90 ppi
- Good
  - Pretty good all round, with a fair bit of detail
  - ~110 ppi
- Very Good
  - This will be fine for most uses, unless you get up reeeeal close
  - ~125 ppi
- Excellent
  - As good as a photo for most purposes
  - ~150 ppi
- Photo Quality
  - Woohoo! Fantastic quality print, full of detail and perfect for your picture frame or for your showing off your very best shots.
  - >=200 ppi
- Matches Photo Lab Printers
  - 300 ppi

Another Perspective (Thom Hogan)

- Poor: <180 ppi
- Good: 180 to 287 ppi
- Excellent: ≥ 288 ppi

sensor	8x10"	11x14"	13x19"	24x36"
4mp 2464x1632	good 204 dpi	poor 148 dpi	poor 130 dpi	poor- 68 dpi
6mp 3008x2000	good 250 dpi	good- 181 dpi	poor 158 dpi	poor- 83 dpi
8mp 3504x2336	excellent 292 dpi	good 212 dpi	good- 184 dpi	poor 97 dpi
10mp 3872x2592	excellent 324 dpi	good 235 dpi	good 203 dpi	poor 108 dpi
12mp 4288x2848	excellent 356 dpi	good 259 dpi	good 225 dpi	poor 119 dpi
16mp 4992x3328	excellent 416 dpi	excellent 302 dpi	good 262 dpi	poor 138 dpi
18mp 5232x3516	excellent 439 dpi	excellent 320 dpi	good+ 275 dpi	poor 145 dpi
21mp 5616x3744	excellent 468 dpi	excellent 340 dpi	excellent 295 dpi	poor 156 dpi

Do You Need to Resize?

- No need to reduce the number of pixels if you have more than needed: the lab/printer will adjust for you
- If you have too few pixels, there are programs that can invent more pixels for you
  - Photoshop
    - Bicubic smoother in 10% increments
  - on1 Perfect Resize (used to be Genuine Fractals)
  - Images free of noise and artifacts can be upsized ~2x without it being noticeable at normal viewing distances
    - Need good shot technique (no blur due to hand-holding or too slow a shutter speed)

What About Print Shapes That Don't Match Your Camera

- Standard cameras image shapes
  - 3x2
  - 4x3
  - 16x9
- Standard print sizes
  - 6x4
  - 7x5
  - 10x8
  - 14x11
  - 20x16
- You will need to crop your image to match the print shape or the Lab will do it for you

Often, the Lab's Software Will Help You Crop

■ Just drag the cropping box to choose how you want your image cropped to fit the shape of the print you are ordering
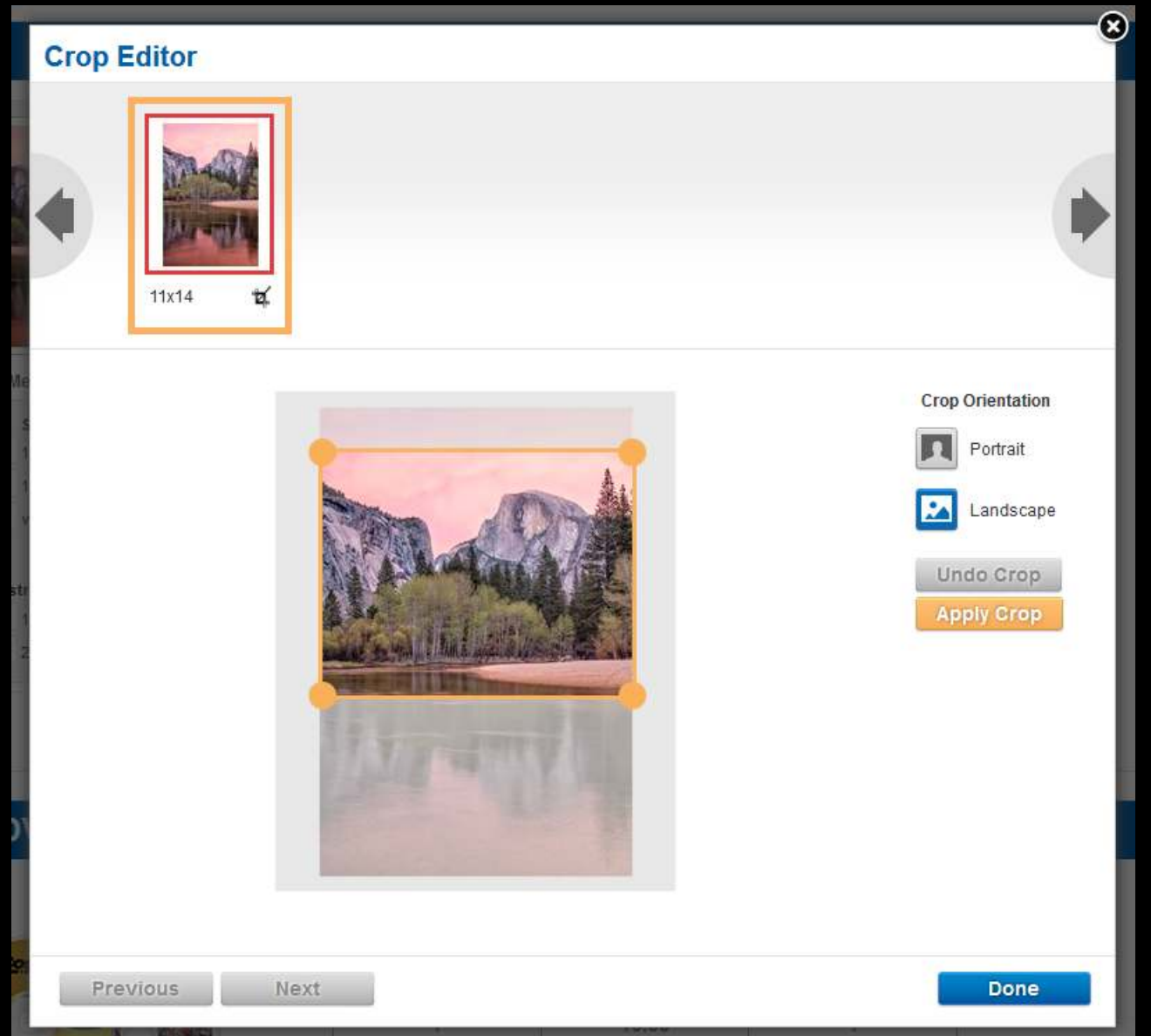
Auto-Adjustments

- Consumer Labs such as Costco, Mpix, Walmart, etc. will adjust the brightness, contrast and color of your prints
    - This usually creates a saleable print even if you submitted an image that was over/under exposed or shot under unpleasing lighting conditions
    - The auto-adjustment algorithms often work just fine, but they ruin images that are non-standard
        - Low- or high-key images
        - "Moody" color or lighting conditions

Example (Thanks, Lestlie Prokosch!)

The Costco 8x10 Print Was Washed Out

■ Since the subject is dark, the automatic exposure adjustments tried to brighten it to a mid-tone
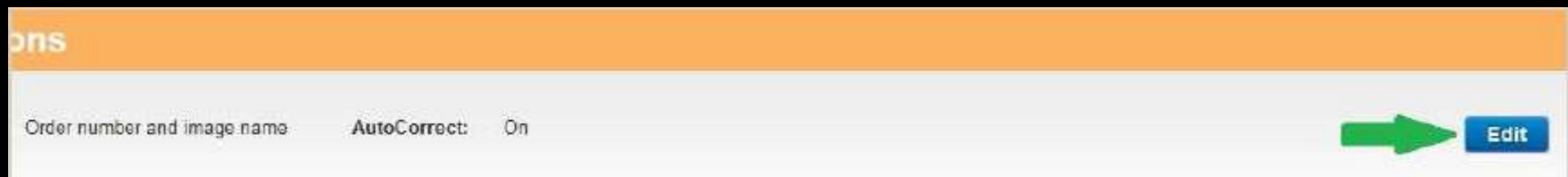
■ The solution: turn off auto-adjustments

Order number and image name   AutoCorrect: On   Edit

Print Options

Add back printing
Please choose what text you would like to appear on the back of your photos.

○ Order number
● Order number and image name
○ Order number, image name and custom text
○ Order number and custom text

Remove AutoCorrect

AutoCorrect is a feature that most amateur photographers use. If you've used an editing tool such as Adobe Photoshop to adjust your images or select printer profiles, you should turn off AutoCorrect to make sure that your prints are not altered.

☑ Do not AutoCorrect my prints

These changes apply to this order only. If you wish to make these your default settings please go to your account preferences.

Cancel   Continue

Media

- Labs offer many different media to print on
  - Photo prints: Glossy, Lustre, Matte, Pearl paper
  - Inkjet prints: Fine Art papers
  - Canvas
  - Wood
  - Aluminum
  - Acrylic (plexi-glass)
- Choose the Lab that offers the media you want for your prints at a price you're willing to pay

Consumer Labs

- **Costco**
  - Photo prints: Glossy, Lustre paper
  - Inkjet prints: Lustre paper
  - Poster board
  - Canvas (mail order only)
- **Mpix**
  - Photo prints: Glossy paper, Metallic paper (color—pearl, B&W—matte)
  - Canvas

Pro Labs (they do not do auto-adjustments)

- **Mpix Pro**
  - Photo prints: Glossy paper, Metallic paper (color—pearl, B&W—matte)
  - Inkjet prints: Fine Art Paper
  - Canvas
- **WHCC**
  - Photo prints: Glossy, Lustre, Matallic paper
  - Inkjet prints: Fine Art Velvet (cotton) paper
  - Fine Art, Lustre, Glossy, Metallic Paper Canvas

More Pro Labs

- **Bay Photo**
  - Photo prints: Lustre, Glossy, Metallic, Deep Matte, or Pearl
  - 15 Premium Textured Papers (inkjet)
  - Metal prints
  - Metal or photographic prints with acrylic face
  - Canvas prints
- **Bumblejax**
  - Acrylic, Acrylic Block, Bamboo, Aluminum, Dibond, Gatorfoam
- **Metal Mouth Prints**
  - Metal Prints, FMK Metal Prints (harder than acrylic), Metallic Canvas, Chromaroll

Printing at Costco

- Two choices:
  - Go to store and use kiosks
  - Upload images over the internet, receive prints via mail or store pickup
- Use JPEG images with sRGB color space
- Images need to match one of the available sizes or they will be cropped
  - Costco's software allows you to indicate how they are cropped
  - You can use your image processing software to pad edges to avoid cropping
- Most people will allow automatic adjustments (brightness, colors)
  - Printer profiles are available for those who want to take full control

Image Size Dictates Which Photo Printer Is Used

- **Up to 12x18 are printed on Noritsu**
  - These prints remain flat
  - Large prints delivered in envelope with cardboard to protect them
  - Image sizes seem true: if you size for a mat, you can base size on exact measurements
  - 300 dpi is optimal

Image Size Dictates Which Photo Printer Is Used

- 16x20 and 20x30 are printed on Epson
  - Prints are rolled and inserted into plastic bag
  - Can request to be left flat at the counter; need to pick up promptly or they will be rolled
  - Image size is reduced slightly: need to increase dimensions to fit a particular mat
  - Use 300 dpi

Adjusting Print Dimensions on Epson

- Mat for a 13x19 picture has a 12.5x18.5 opening
  - Printed picture should be 12-5/8x18-5/8 to easily overlap mat opening (or 12-5/8x19-1/16 for a 2:3 image)
  - I set image size to 12.85x19.275 to get a print of size 12.625x19.067 on Epson printer
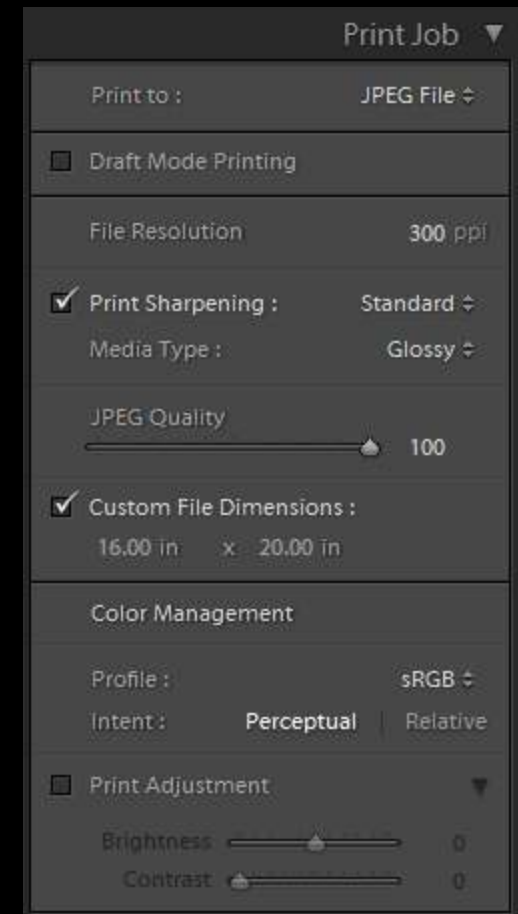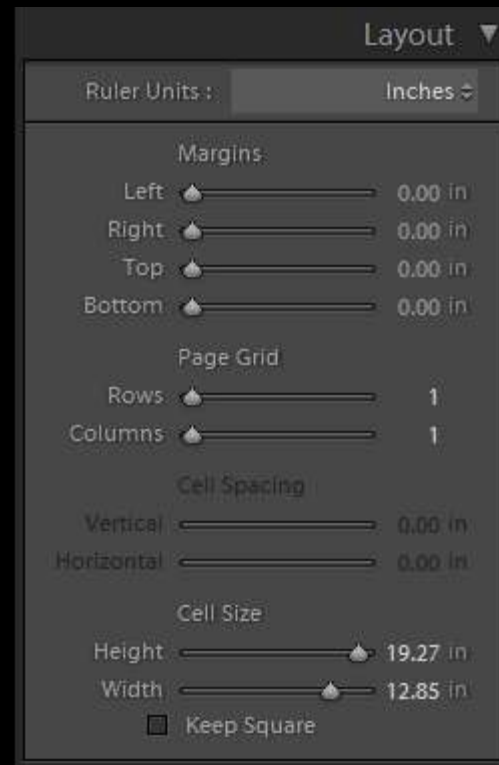
Printing at WHCC

- Online only
- Prices seem to be slightly better than MpixPro
- $12 minimum order, though
- They also have periodic sales (20% off)

Free 2-Day Shipping

Photographic Prints		
Print Size	Lustre/Glossy	Metallic
Yearbook	$1.00	$1.20
8 up wallet (2.5x3.5)	2.20	2.64
56 wallet special	13.00	15.60
3.5x5	.68	.82
4x5	.68	.82
4x6	.73	.88
5x5	1.00	1.20
5x7	1.15	1.38
8x8	2.45	2.94
4x10	1.45	1.74
5x10	1.65	1.98
7x10	2.20	2.64
8x10	2.20	2.64
8x12	3.80	4.56
9x12	3.80	4.56
10x10	2.90	3.48
10x13	3.90	4.68
10x15	4.40	5.28

10x20	8.90	10.68
5x30	15.50	18.60
10x30	16.80	20.16
11x14	4.40	5.28
11x16	6.30	7.56
12x12	4.15	4.98
12x18	6.30	7.56
12x24	14.75	17.70
15x30	25.50	30.60
16x16	14.50	17.40
16x20	14.50	17.40
16x24	21.25	25.50
20x20	21.75	26.10
20x24	22.00	26.40
20x30	27.50	33.00
20x40	39.75	47.70
24x30	33.75	40.50
24x36	45.50	54.60
30x30	45.50	54.60
30x40	46.50	55.80

Printing at WHCC

- You need to signup as a client
  - Fill out a questionnaire
  - Submit up to five 8x10 test images. You'll receive these prints free, along with samples of their photo papers
  - They do not auto-adjust. These test prints are used to make sure the images on your screen match the prints
    - You need to calibrate and profile your monitor to get a match

Calibrating and Profiling

- The Thursday December 17th workshop (*Mirada Room, Montecito Clubhouse*) will show how to do this
- Key points
  - Must use known, good test images, not your own
  - Need to establish the light you view the images in
  - Need to choose monitor brightness and color temperature to calibrate/profile to
    - Modify these values and redo the calibration/profiling until you can get the screen to match the print

Other Things to Know

- Image color space (sRGB, Adobe RGB, Pro Photo RGB) needs to be embedded in the jpeg file you send them
  - Easy with Lightroom or Photoshop

Embedding color space from Lightroom

- Under Color Management use pull-down menu to select profile
- Use sRGB, Adobe RGB or Pro Photo RGB
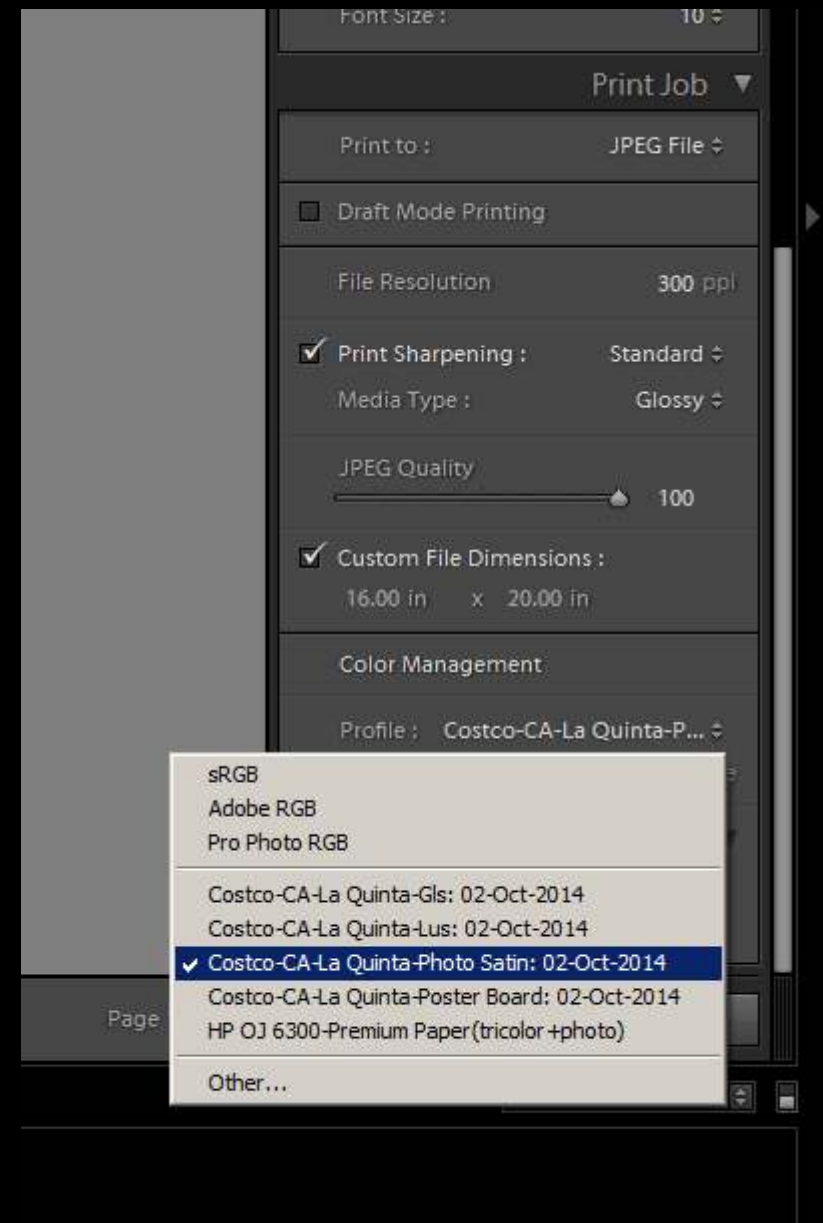
■ **Embedding color space from Photoshop**

- Use Edit->Convert to Profile to use the appropriate ICC profile (sRGB IEC61966-2.1, etc.)
- Save as a JPEG (if image is 16-bit mode, will have to convert to 8-bit mode first)
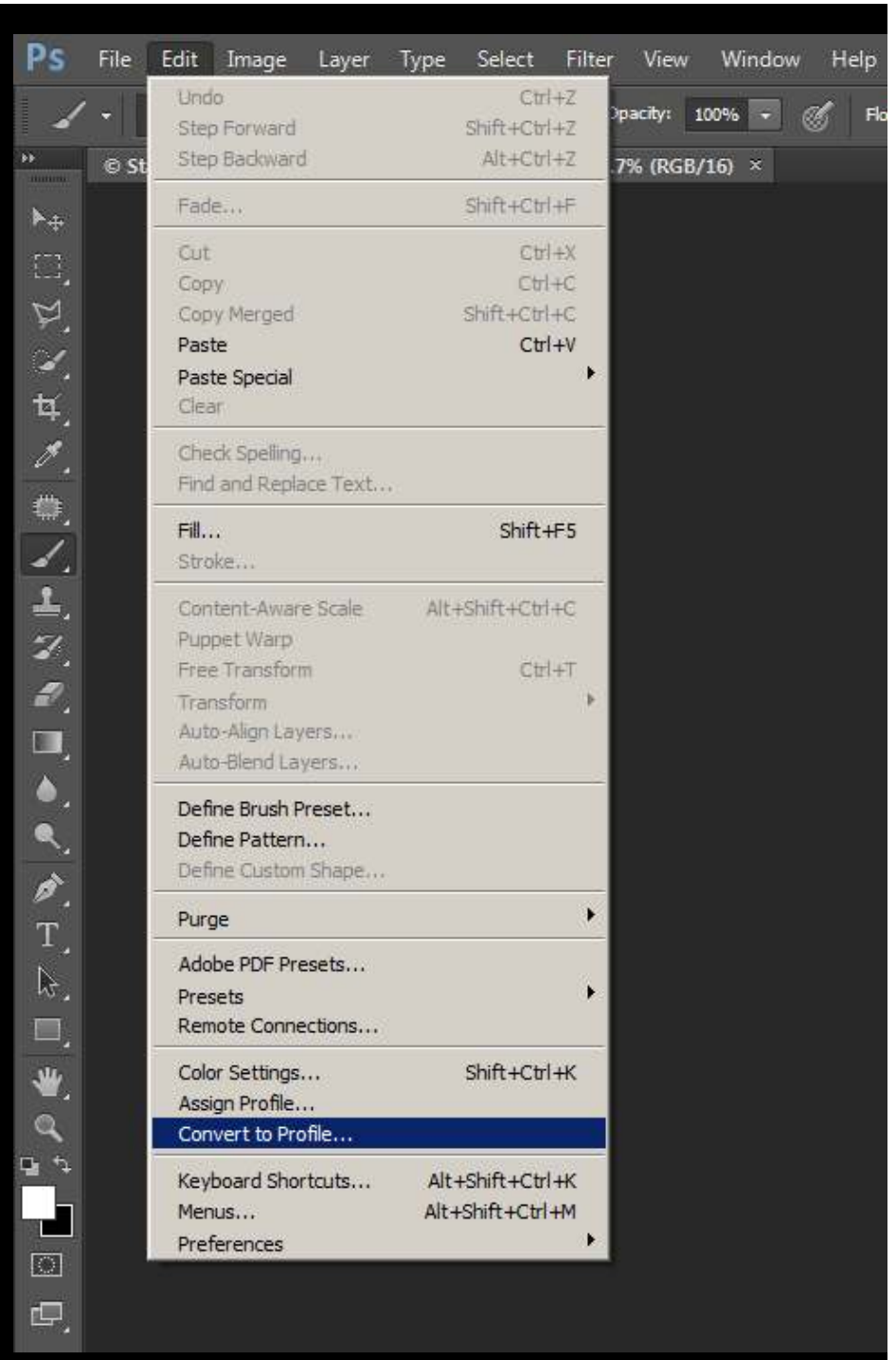
Other Things to Know

- WHCC provides ICC profiles for their printers/papers
  - These are used to soft-proof your images. You can customize the image file to account for gamut differences between your monitor and the print

Soft Proofing Using the Printer Profile

- Choose rendering intent that works best
  - Perceptual
    - Takes any colors that are out of gamut and moves them back in
    - Any colors that are "in the way" are moved to maintain the relationships between the colors
    - Maintains smooth color gradations, but can cause an overall color or brightness shift in image
  - Relative Colormetric
    - Also moves out of gamut colors back into gamut, but leaves in-gamut colors as-is
    - Can cause banding or "grunge" in finely gradated areas such as sky
- Can edit soft proofed image to fine-tune print output
  - Do this on a copy of your image since edits are just for the specific printer

Softproofing in Lightroom

Soft Proofing in Photoshop
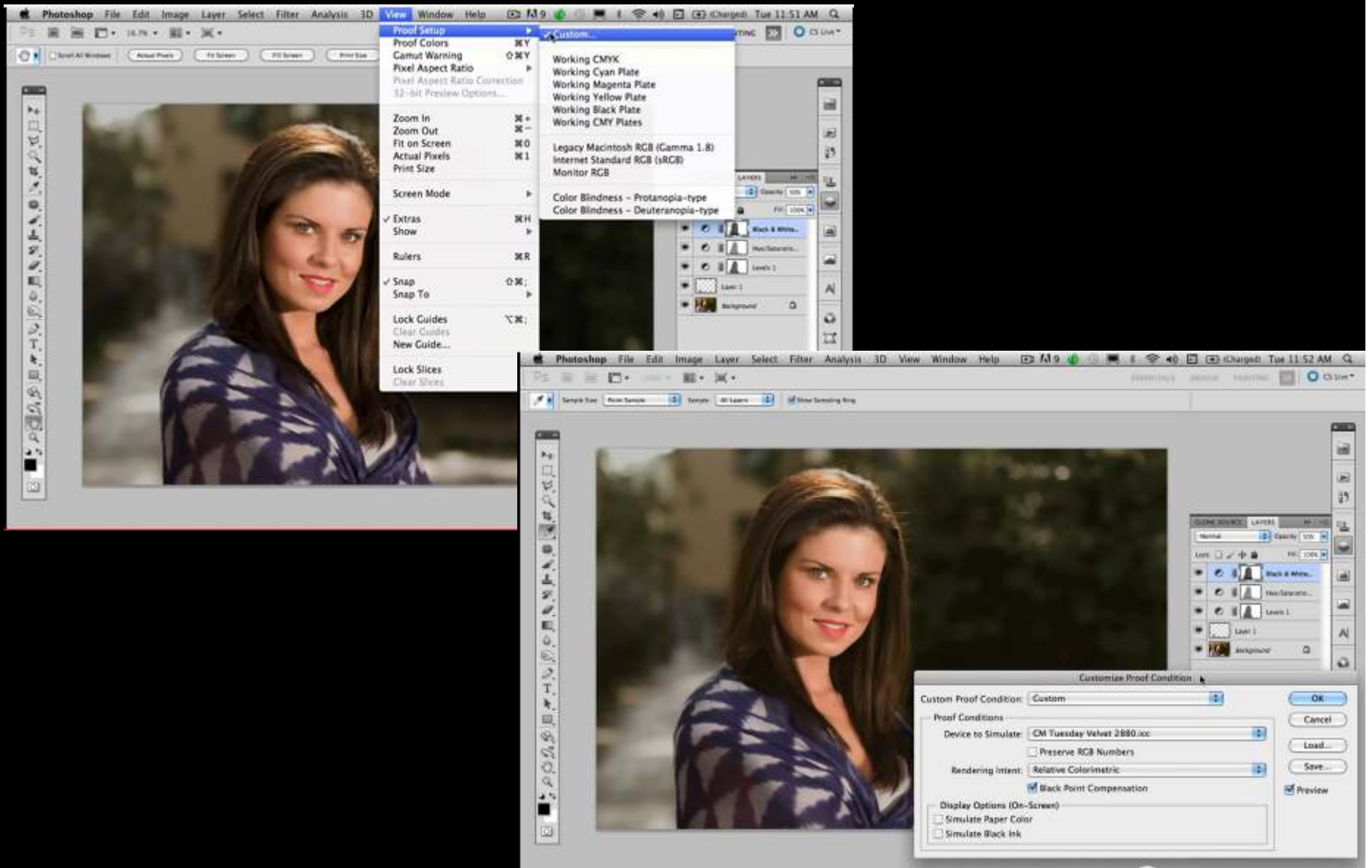
Other Things to Know

- WHCC photo prints are scaled up in size by 2% (to allow borderless prints)
    - If you need your image to be an exact size to fit in a mat window, you may want to account for this
- Prints are ordered through an app they provide: ROES
    - This is an industry standard Java app customized by each lab

WHCC ROES

Select a Product

Select a Product

PRINTS
Photo Prints
Print Fulfillment
Fine Art Canvas + Velvet

PROOFING
3.5x5 Photo Proofs
4x5 Photo Proofs
4x6 Photo Proofs
5x5 Photo Proofs
5x7 Photo Proofs
Proofbooks

WALL DISPLAYS
Bamboo Panels
Float Wraps
Framed Prints
Gallery Wraps
Image Blocks
Metal Prints
Standout

Welcome to ROES

How to Use ROES:

View and order products by clicking and scrolling through the Product dropdown menu in the upper left.

Select a Product

Select a Product

PRINTS
Photo Prints
Print Fulfillment
Fine Art Canvas + Velvet

PROOFING
3.5x5 Photo Proofs
4x5 Photo Proofs
4x6 Photo Proofs
5x5 Photo Proofs
5x7 Photo Proofs
Proofbooks

WALL DISPLAYS
Float Wraps
Framed Prints
Gallery Wraps
Image Blocks
Metal Prints
Standout

CARDS

Quick Start Video

Click here to launch and play the Quick Start video.

Favorites

Welcome to ROES Qty: 1

Add to Or

Add folder

Prints

9 images

- Add folders of images from your computer
- Drag and drop to the create a print
- Click "Add to Order" then Checkout
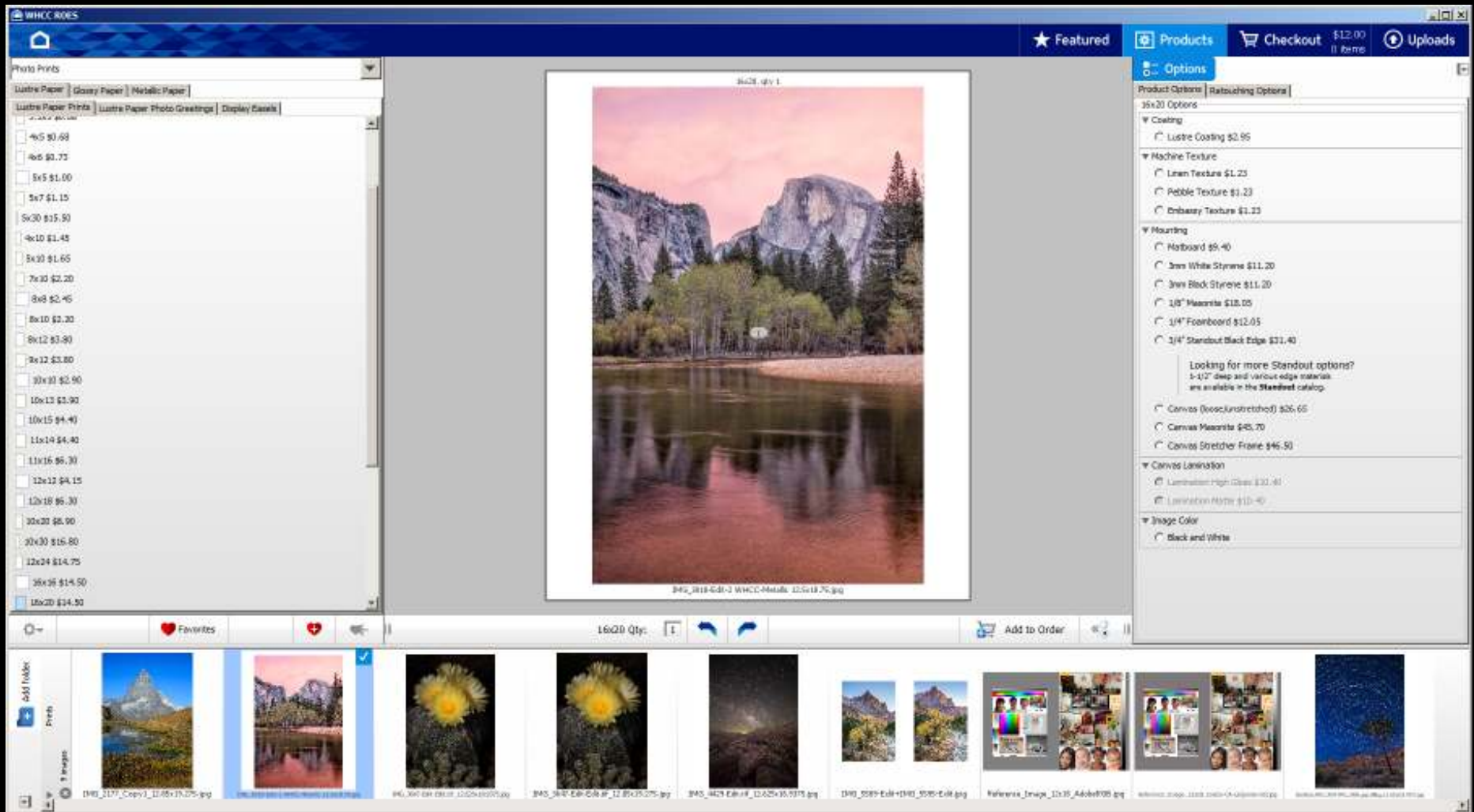
You Get Your Prints Back, Now What?

- **Mount or mat them!**
  - Mat boards are available at Aaron Brothers, Michael's, Jo-Ann's, Hobby Lobby and elsewhere
    - Likely standard sizes with standard sized windows
  - For custom mat sizes or windows, order online
    - Matboard Plus (www.matboardplus.com) has standard and custom sizes available
      - No extra charge for a custom mat window
      - Window will be exactly the dimensions you specify
    - It's best to order several mats at once to spread out the shipping cost