The Arcane & Mystical Knowledge

SHARPENING

Sharpening: What is it?

- Enhancement of local contrast that produces the appearance of greater definition and clarity (accutance).

- Where areas of different luminance values abut, sharpening lightens higher values (whites) and darkens lower values (grays).

Why do it?

- Most digital pictures are somewhat soft and require sharpening.
- Certain output formats may require different levels of sharpening.
- Caveat – If you are shooting JPEGs, remember that your camera is automatically sharpening.

Considerations

- Sharpening methods
- Stage of workflow
- Selective sharpening
- Sharpening side-effects

Sharpening Methods

- Unsharp Mask (USM)
- High Radius USM
- High Pass Filter
- Manual
- Single channel sharpening
- LAB sharpening
- Automated sharpening

Sharpening Methods

- *Unsharp* Mask (USM)
  - ??????????????

OR – I thought we wanted to sharpen not unsharpen!!!

Sharpening Methods

- Unsharp Mask (USM)
  - A term brought over from film photography.
  - The back of a glass plate positive was contact copied to a film negative producing a blurred (unsharp) negative. Both the positive and negative were placed in an enlarger. The effect of this was to block out (mask) any blurred (unsharp) areas and to increase contrast at lines between higher and lower luminance (edges).

Sharpening Methods

- Unsharp Mask (USM)
  - Digital USM operates on the same technique.
  - Instead of using a low contrast film negative, the picture editor generates a blurred version of the image.
  - It then compares the original and the blurred version and increases contrast at edges where the difference is greater than a specified amount (threshold).

Sharpening Methods

- Unsharp Mask (USM)
  - 3 Parameters
    - Amount
    - Radius
    - Threshold

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    - Amount
      - The amount of contrast added to edges.
      - Usually expressed as a percentage.
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      - The number of pixels from an edge that are affected.
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Sharpening Methods

- Unsharp Mask (USM)
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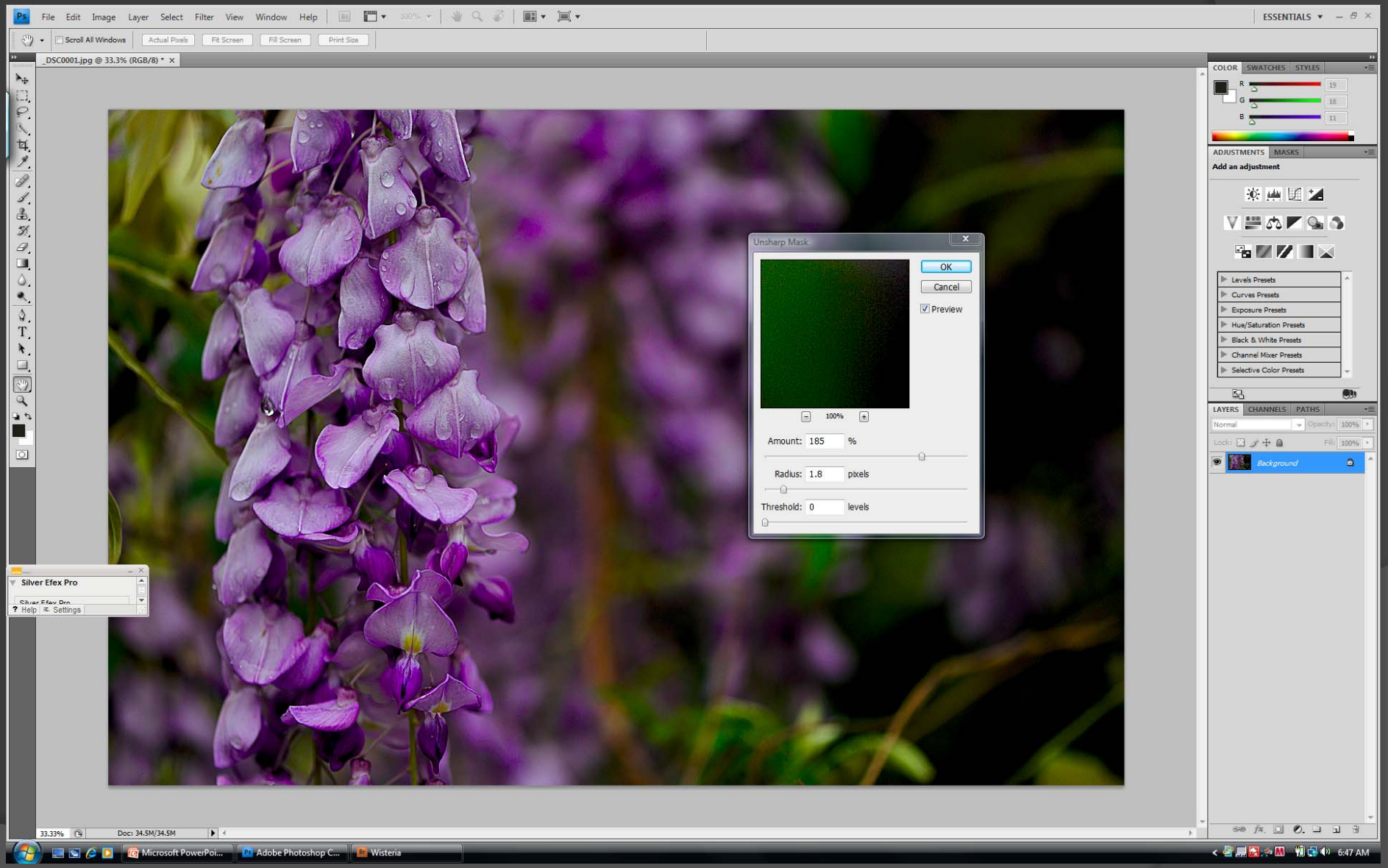
      - Usually expressed as a percentage.
    - Radius
      - The number of pixels from an edge that are affected.
    - Threshold
      - Determines how much difference in luminance there has to be before sharpening is applied.
      - Higher thresholds limit sharpening to edges of greater luminance differences.

USM in Photoshop



Sharpening Methods

- Unsharp Mask (USM)
  - 3 Parameters
    - Amount
    - Radius
    - Threshold
  - What values do I use?
    - Depends on the size (# of pixels) of your file. The smaller the size, the greater the effect particularly from the radius adjustment.
    - Depends on your output format. Photos on the web require less sharpening than those to be printed.

Sharpening Methods

- Unsharp Mask (USM)
  - 3 Parameters
  - What values do I use? For a full size 10+ megapixel photo try:
    - Amount – 150% to175%
    - Radius – 1.5 to 2.0
    - Threshold – 0 to 1

Sharpening Methods

- High Radius USM
  - A variant of USM.
  - Settings:
    - Radius – 12 to 20 pixels
    - Threshold – 2 to 5
    - Amount – 50% to 75% (but this really doesn't have much of an effect)
  - Tends to sharpen larger elements with lesser or no effect on smaller elements.

Sharpening Methods

- High Radius USM
  - A variant of USM.
  - Settings:
  - Tends to sharpen larger elements with lesser or no effect on smaller elements.
    - Helps separate larger elements from the background.
    - May help control noise.

Sharpening Methods

- High Radius USM
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    - May help control noise.

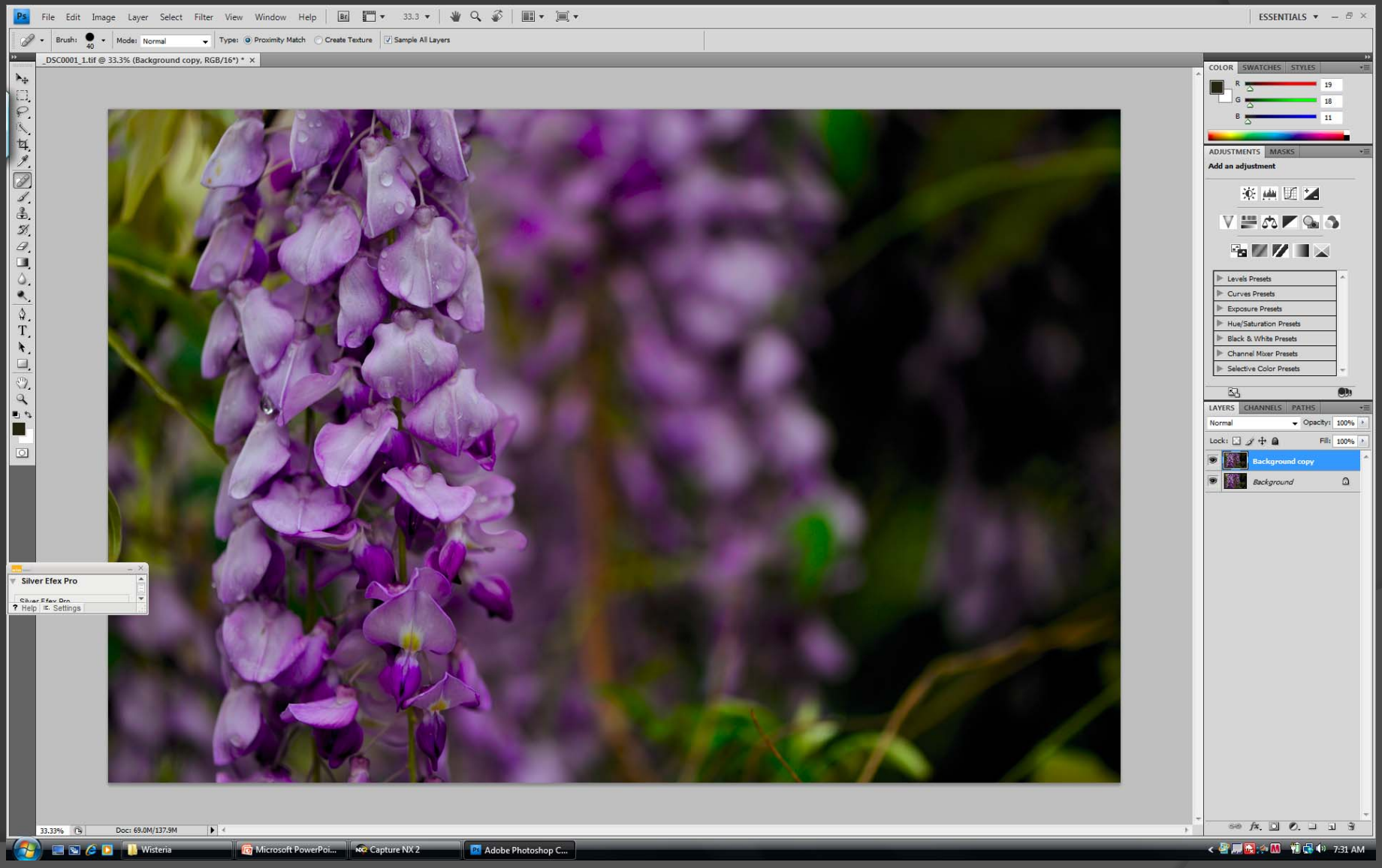
Sharpening Methods

- High Pass Filter Sharpening
  - Uses the High Pass Filter to increase contrast.
  - Tends to work more on planes or surfaces than edges.
  - Acts like High Radius USM in separating objects from the background.

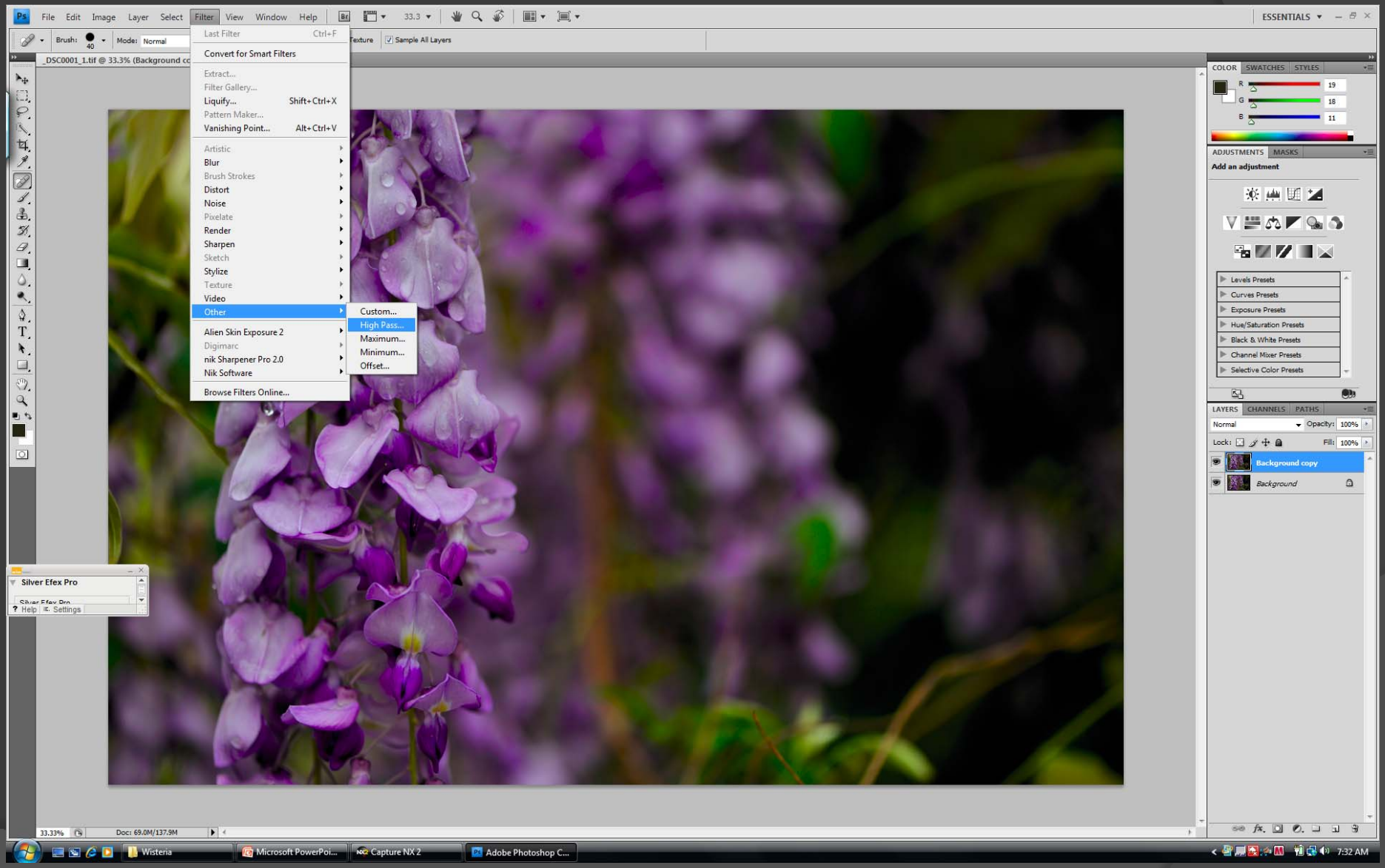
Sharpening Methods

- High Pass Filter Sharpening
  - Steps:
    - Duplicate your layer as a new layer.
    - Apply the High Pass Filter.
      - Filter–Other–High Pass
    - Adjust the High Pass Filter.
    - Change the Blending Mode of the layer to Overlay.

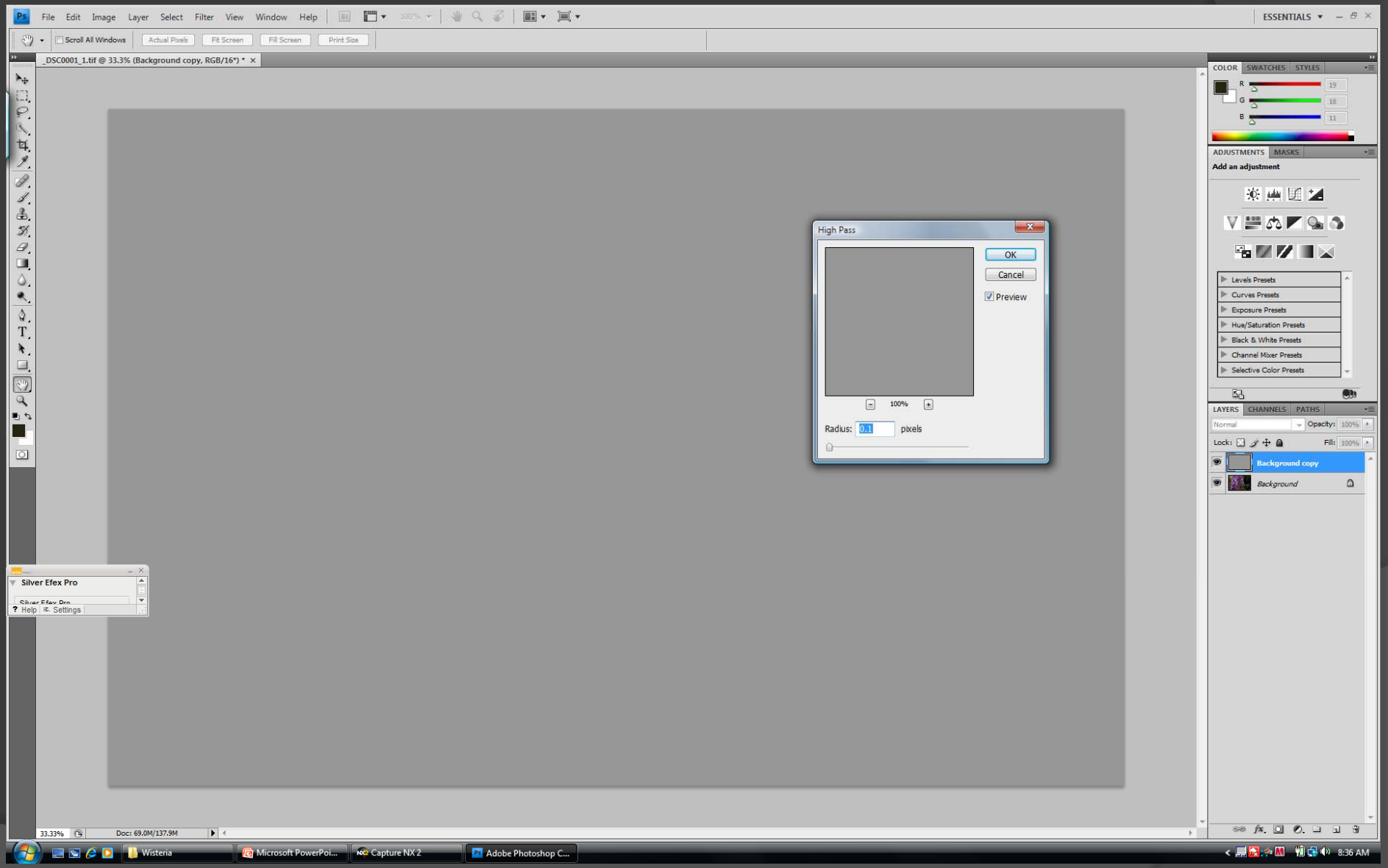
HPS: Duplicate Layer



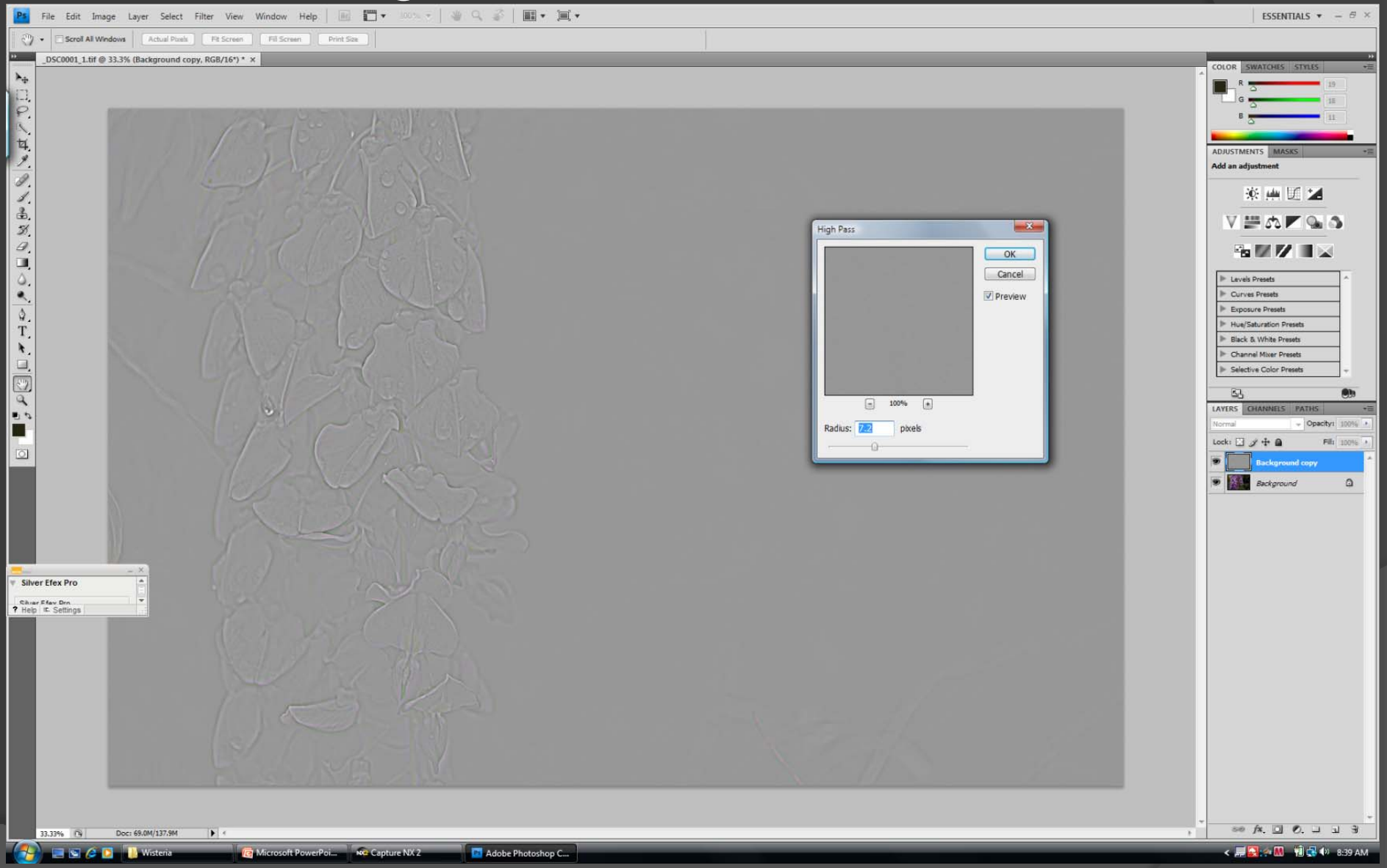
HPS: Select the Filter



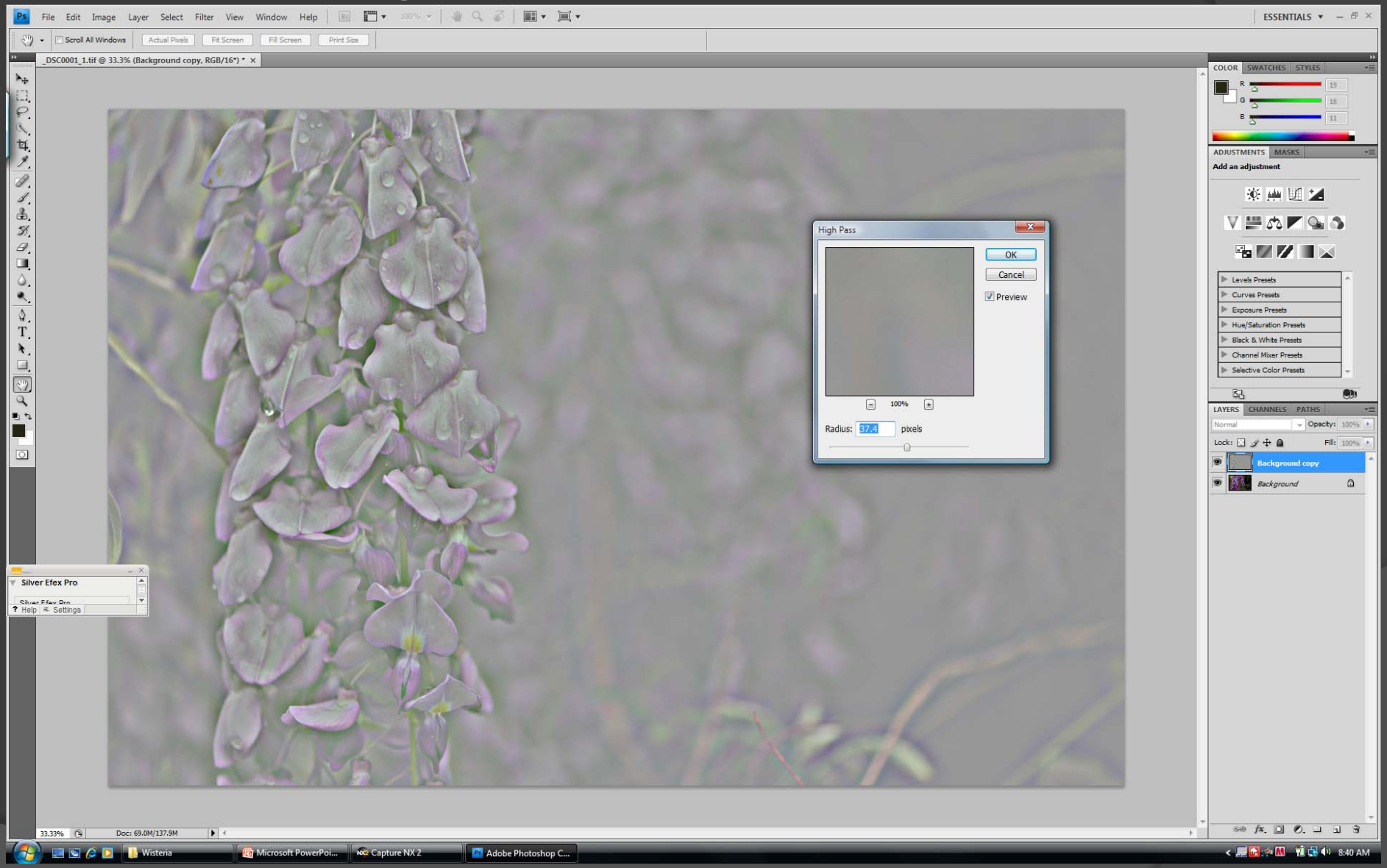
HPS: Apply the Filter



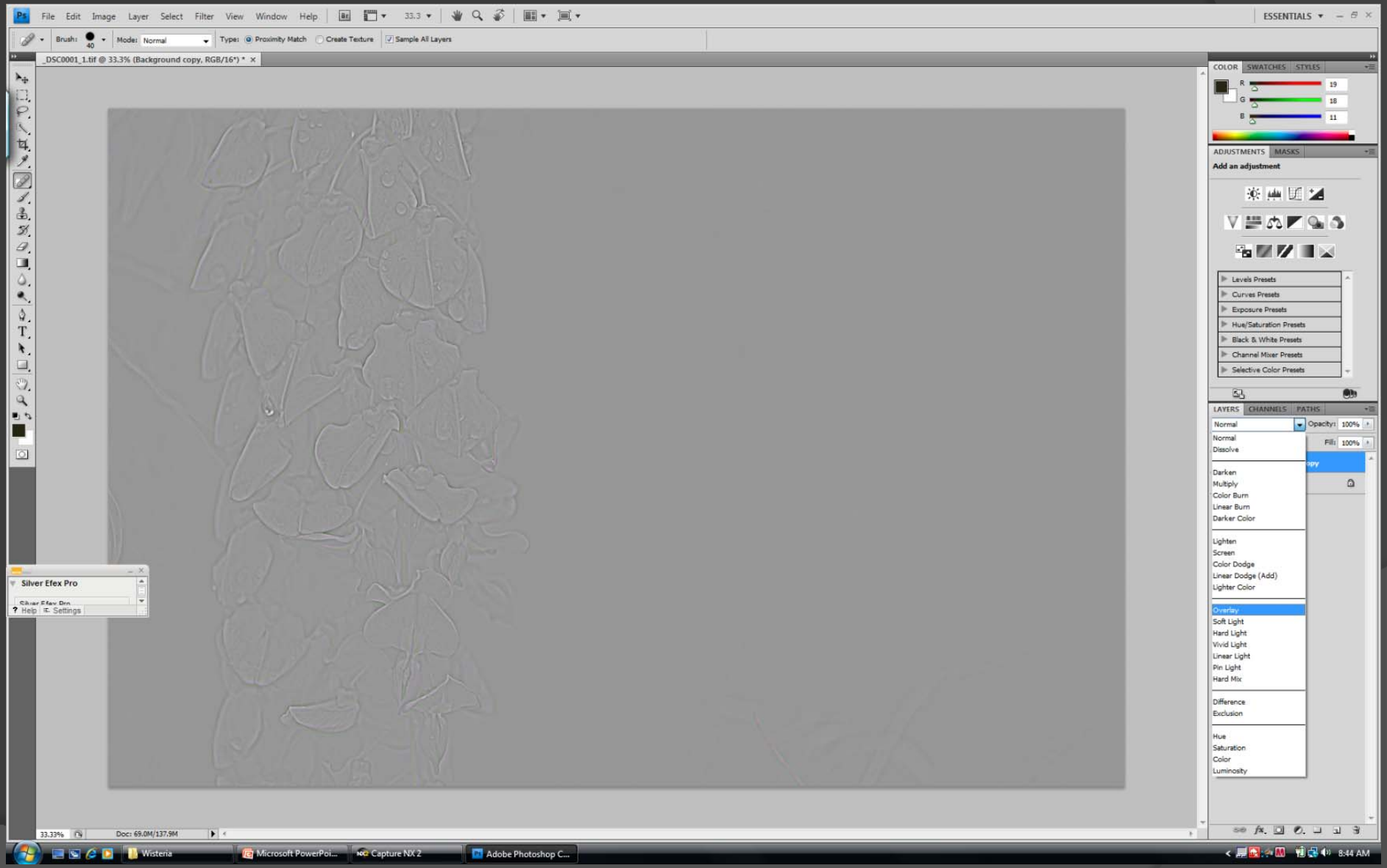
HPS: Adjust the Radius



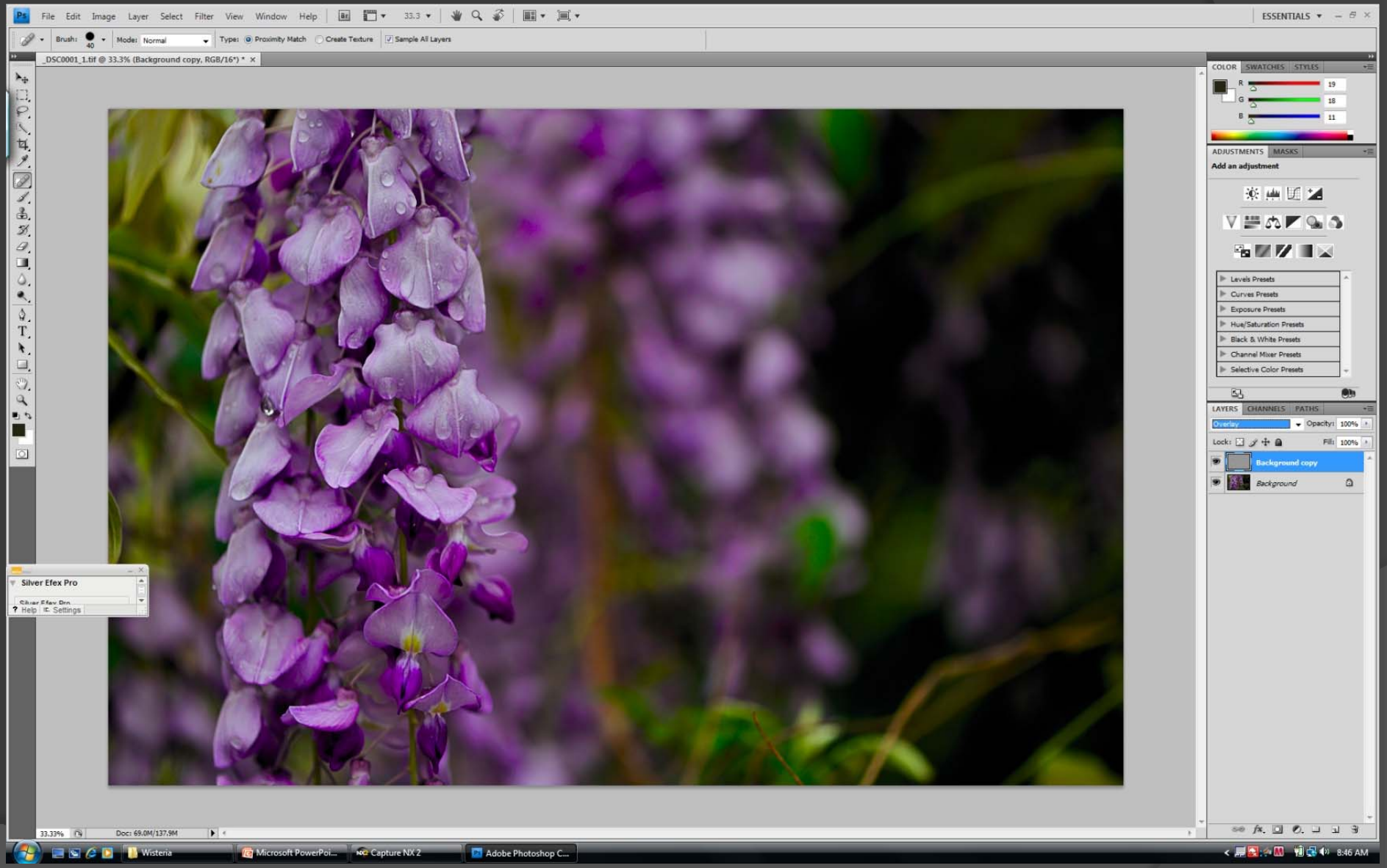
HPS: Adjust the Radius 2



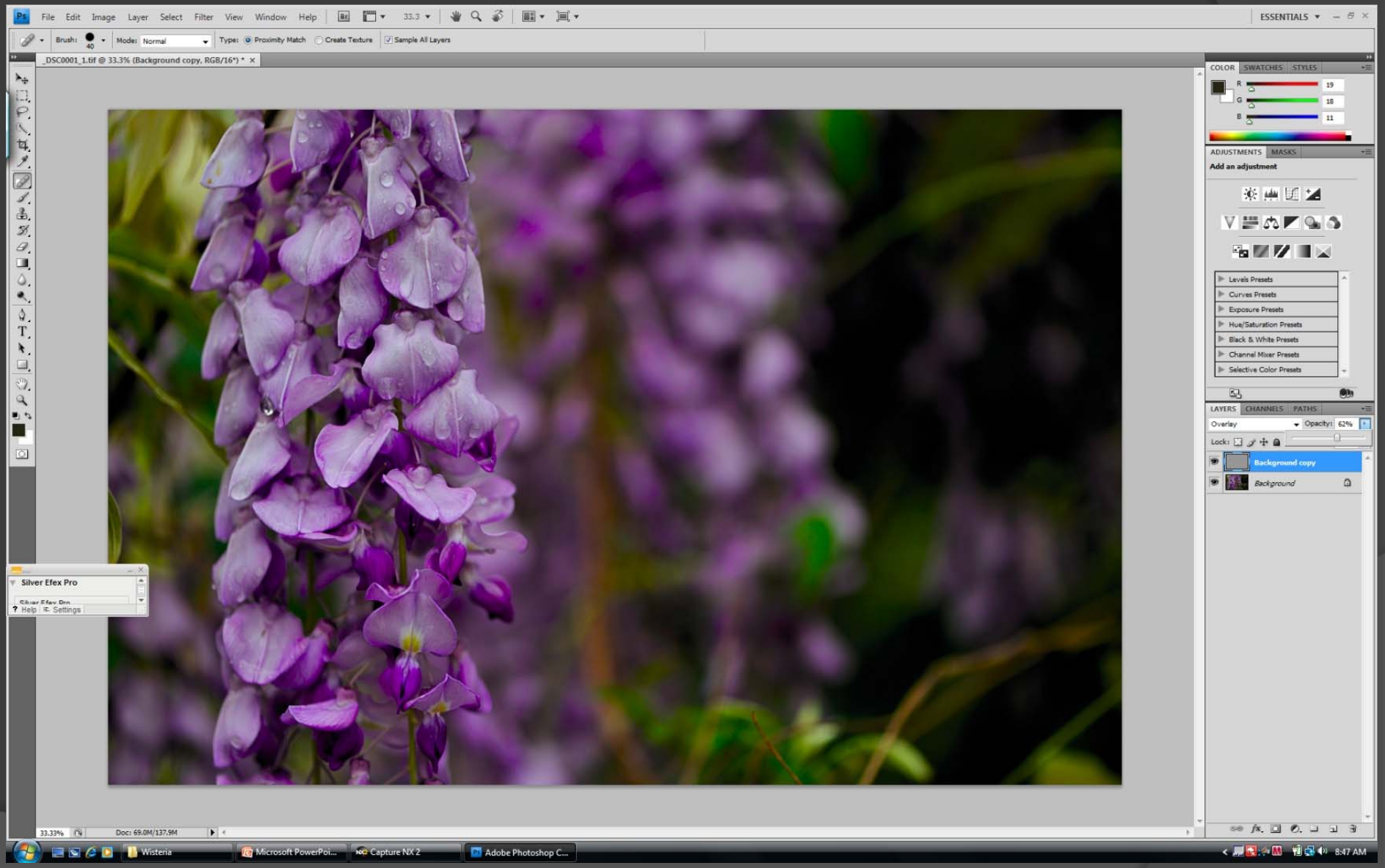
HPS: Select Overlay



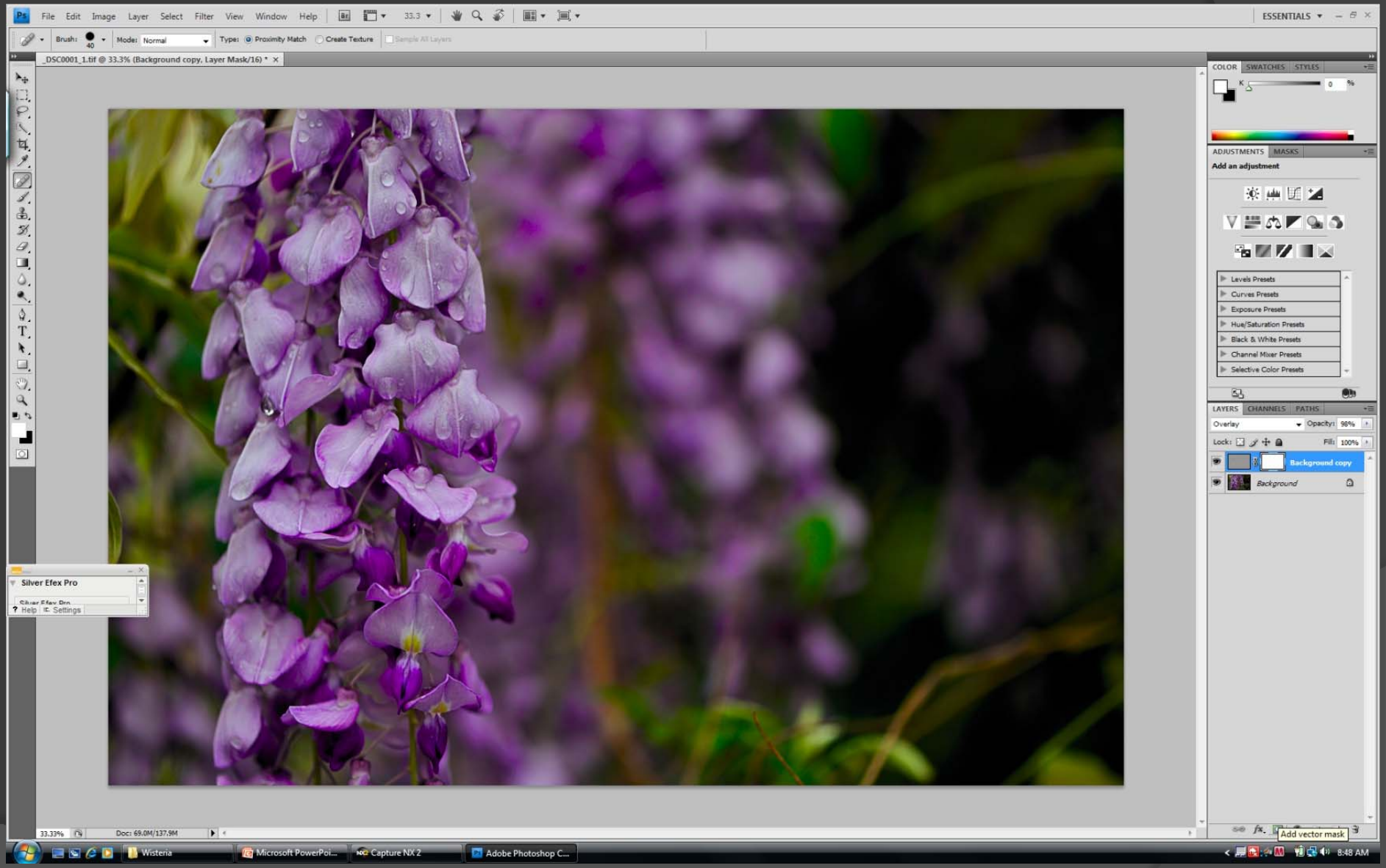
HPS: Result


File Edit Image Layer Select Filter View Window Help
ESSENTIALS
_DSC0001_1.tif @ 33.3% (Background copy, RGB/16*) *
COLOR SWATCHES STYLES
ADJUSTMENTS MASKS
Add an adjustment
Levels Presets
Curves Presets
Exposure Presets
Hue/Saturation Presets
Black & White Presets
Channel Mixer Presets
Selective Color Presets
LAYERS CHANNELS PATHS
Background copy
Background
Silver Efex Pro
Help Settings
33.33%
Wisteria
Microsoft PowerPoi...
Capture NX 2
Adobe Photoshop C...
8:46 AM

HPS: Opacity


File Edit Image Layer Select Filter View Window Help
ESSENTIALS
Brush: Mode: Normal Type: Proximity Match Create Texture Sample All Layers
_DSC0001_1.tif @ 33.3% (Background copy, RGB/16*) *
COLOR SWATCHES STYLES
R 19
G 18
B 11
ADJUSTMENTS MASKS
Add an adjustment
Levels Presets
Curves Presets
Exposure Presets
Hue/Saturation Presets
Black & White Presets
Channel Mixer Presets
Selective Color Presets
LAYERS CHANNELS PATHS
Overlay Opacity: 62%
Lock:
Background copy
Background
Silver Efex Pro
Help Settings
33.33% Doc: 69.0M/137.9M
Wisteria
Microsoft PowerPoi...
Capture NX 2
Adobe Photoshop C...
8:47 AM

HPS: Mask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ESSENTIALS
_DSC0001_1.tif @ 33.3% (Background copy, Layer Mask/16) *
COLOR SWATCHES STYLES
ADJUSTMENTS MASKS
Add an adjustment
Levels Presets
Curves Presets
Exposure Presets
Hue/Saturation Presets
Black & White Presets
Channel Mixer Presets
Selective Color Presets
LAYERS CHANNELS PATHS
Overlay
Opacity: 98%
Fill: 100%
Background copy
Background
Silver Efex Pro
Help Settings
33.33%
Doc: 69.0M/137.9M
Add vector mask
Wisteria
Microsoft PowerPoi...
Capture NX 2
Adobe Photoshop C...
8:48 AM

Sharpening Methods

- Manual
  - Remember that any enhancement of contrast (particularly localized) will enhance apparent sharpness:
    - Global contrast adjustment
    - Black point adjustment
    - Dodging and Burning

Sharpening Methods

- Single Channel Sharpening
  - Useful when sharpening is making noise unacceptable.
  - In RGB, mode the photo is a composite of red, green and blue channels.
  - Often, noise may be worse in one channel than the others.
  - You can select one of the other channels and sharpen directly on that channel.

Sharpening Methods

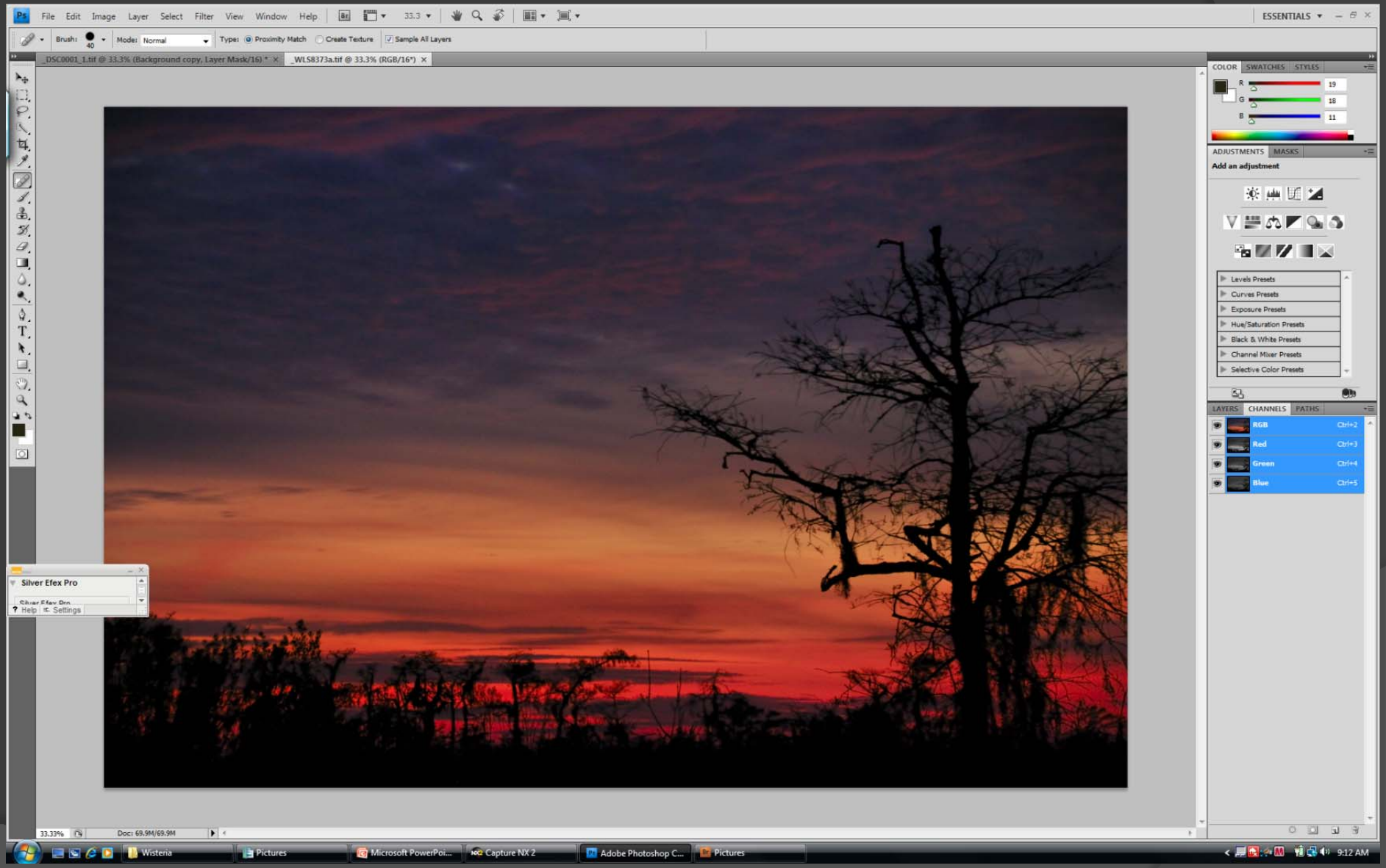
- Single Channel Sharpening

  Example: You have a landscape shot with a blue sky. After you sharpen the noise in the sky makes it look blotchy. You check the individual channels and find that the noise is almost all in the Blue channel. You can select the Red and/or Green Channel and sharpen avoiding sharpening the noise in the Blue channel.

Sharpening Methods

- Single Channel Sharpening
  - Steps
    - Select Channels
    - Examine the Red, Green & Blue Channels
    - Sharpen the Channel(s) with the least noise.

SCS: Select Channels



SCS: Examine Red Channel

SCS: Examine Blue Channel

SCS: Examine Green Channel

Sharpening Methods

- You can apply most sharpening techniques to an individual channel.
- You can also apply many other adjustments to an individual channel.

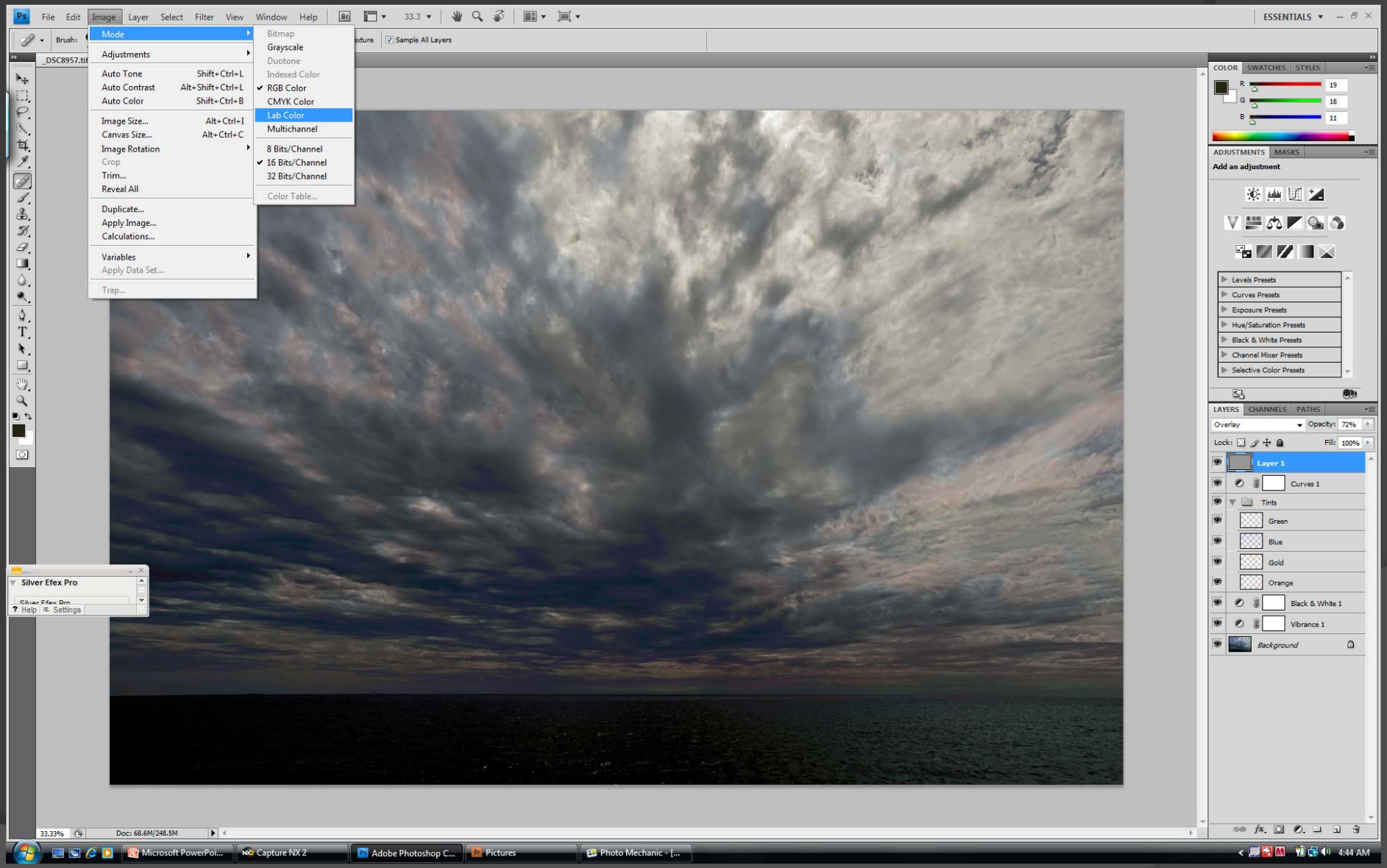
Sharpening Methods

- LAB Sharpening
  - Takes advantage of the LAB Color Mode.
  - LAB is an alternative to RGB.
    - Instead of Red, Green & Blue Channels, it has L (Luminance) and two color channels (A & B)
    - Often, noise in the L channel.

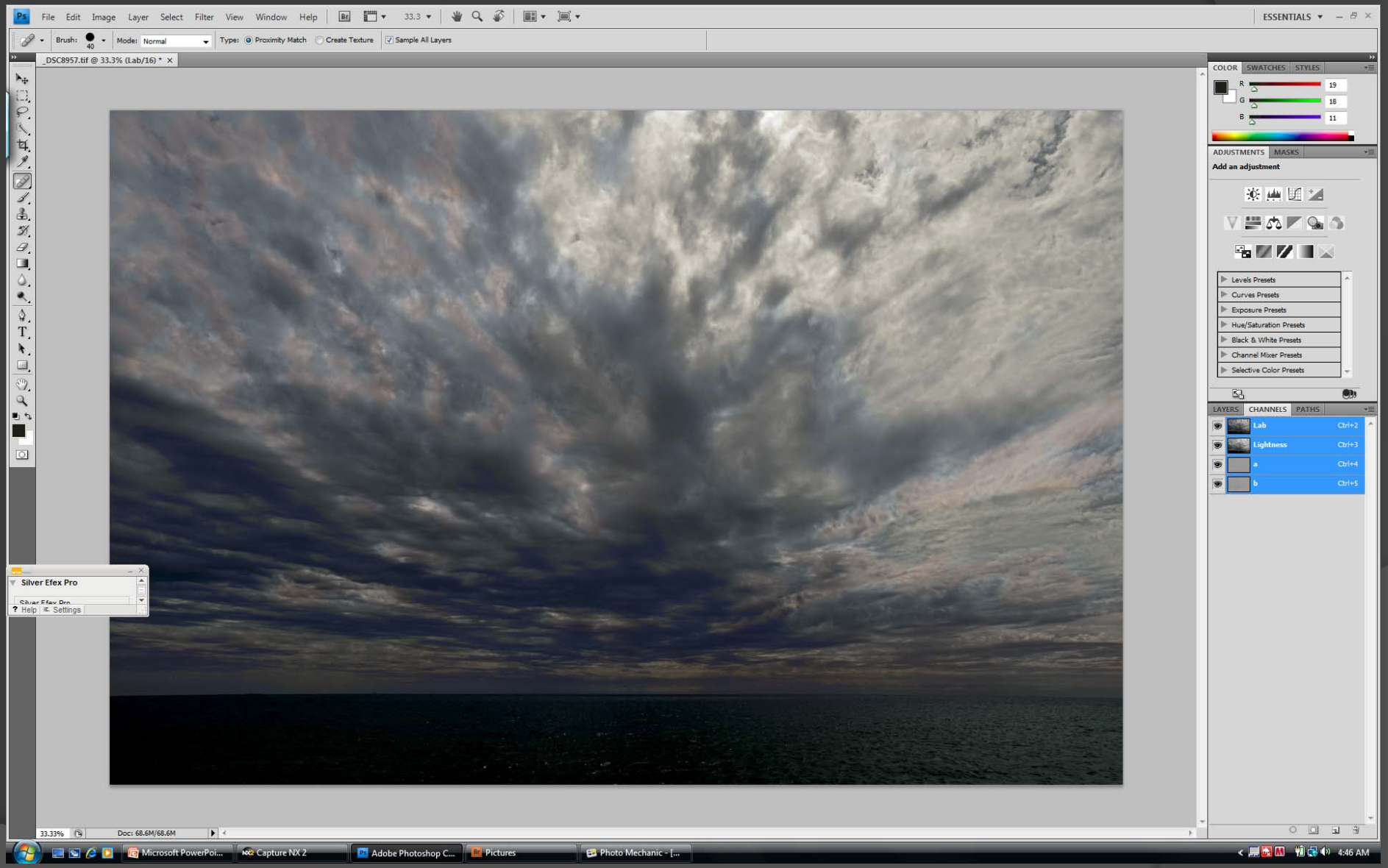
Sharpening Methods

- LAB Sharpening
  - Select LAB color mode.
    - Image – Mode – LAB
    - Select Channels
    - Apply Sharpening to the Lightness Channel

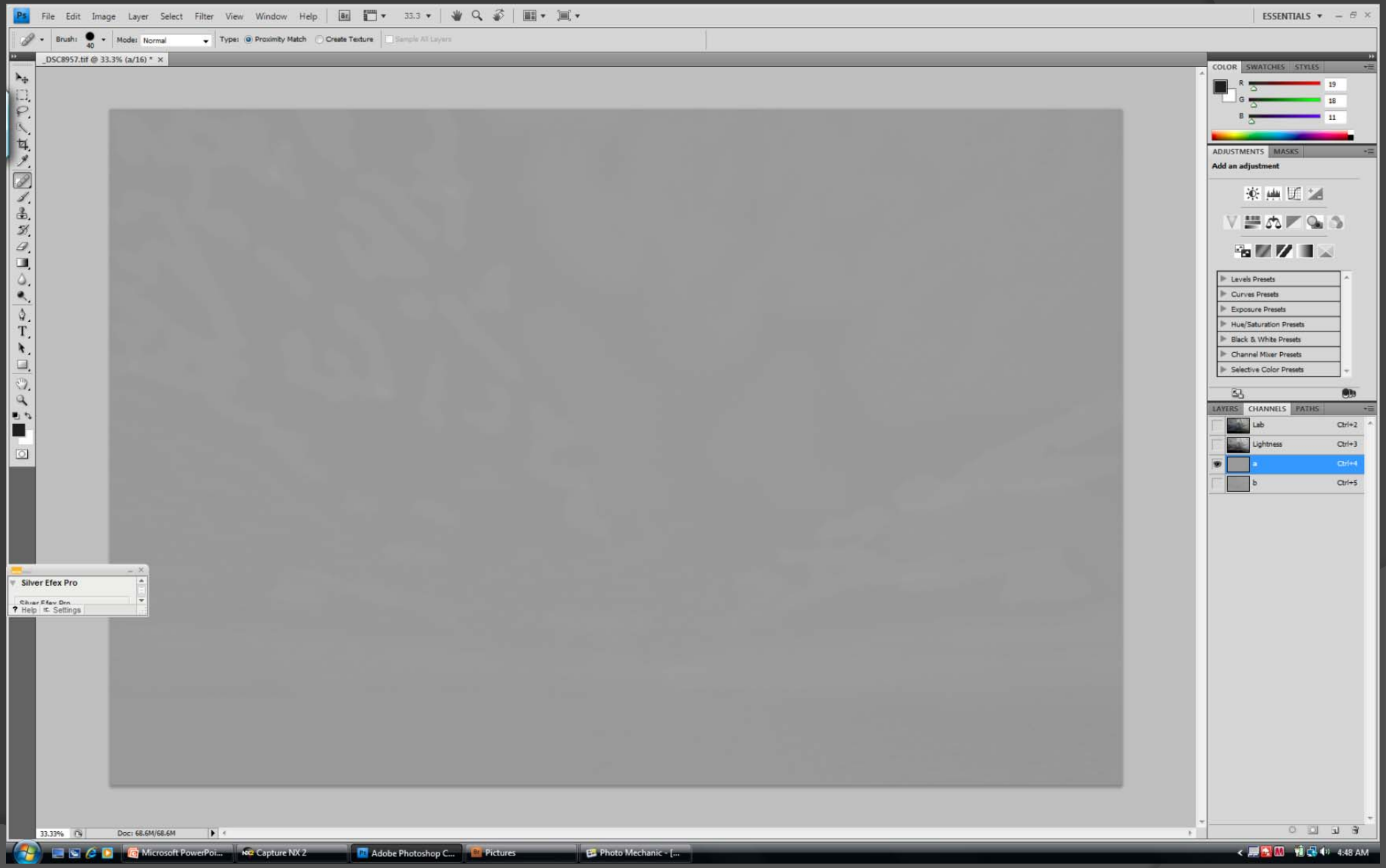
LS: Select LAB Mode



LS: Select Channels



LS: A Channel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ESSENTIALS
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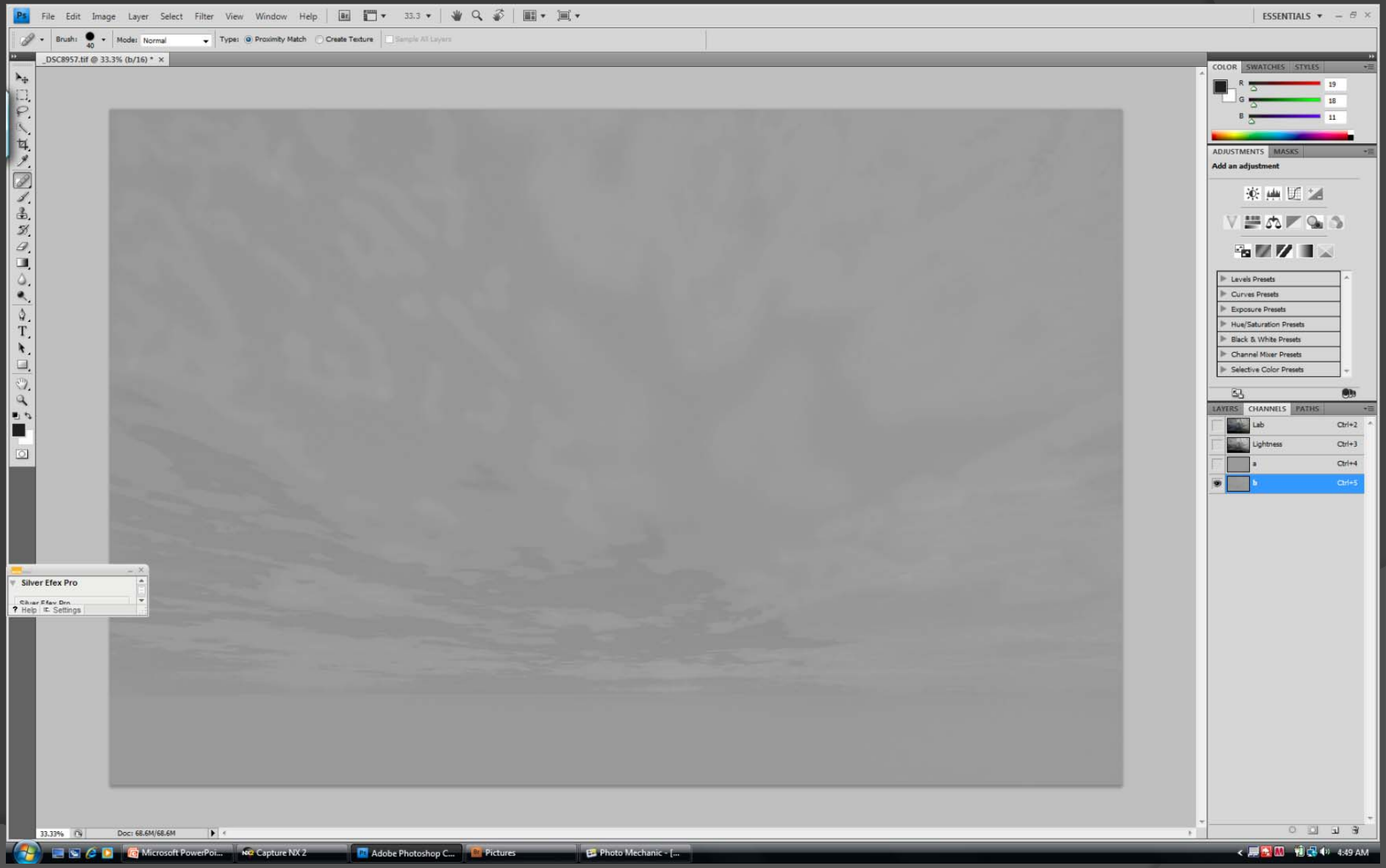
COLOR SWATCHES STYLES
ADJUSTMENTS MASKS
Add an adjustment
Levels Presets
Curves Presets
Exposure Presets
Hue/Saturation Presets
Black & White Presets
Channel Mixer Presets
Selective Color Presets
LAYERS CHANNELS PATHS
Lab Ctrl+2
Lightness Ctrl+3
a Ctrl+4
b Ctrl+5
Silver Efex Pro
Help Settings
33.33%
Doc: 68.6M/68.6M
Microsoft PowerPoi...
Capture NX 2
Adobe Photoshop C...
Pictures
Photo Mechanic - [...
4:48 AM

LS: B Channel


File Edit Image Layer Select Filter View Window Help
ESSENTIALS
_DSC8957.tif @ 33.3% (b/16) *
COLOR SWATCHES STYLES
ADJUSTMENTS MASKS
Add an adjustment
Levels Presets
Curves Presets
Exposure Presets
Hue/Saturation Presets
Black & White Presets
Channel Mixer Presets
Selective Color Presets
LAYERS CHANNELS PATHS
Lab Ctrl+2
Lightness Ctrl+3
a Ctrl+4
b Ctrl+5
Silver Efex Pro
Help Settings
33.33%
Doc: 68.6M/68.6M
Microsoft PowerPoi...
Capture NX 2
Adobe Photoshop C...
Pictures
Photo Mechanic - [...
4:49 AM

LS: Lightness Channel

Automated Sharpening

- There are several programs that perform sharpening for you.
- Nik Software Sharpener Pro 3
  - Raw Presharpening
  - Output Sharpening based on output type, printer and paper.

When to sharpen

- Distinguish 2 types of sharpening
  - Raw presharpening
  - Output sharpening

When to sharpen

- Raw Presharpening
  - Remember, a Raw file is unaltered data straight from the sensor.
  - Unlike a JPG, no sharpening, saturation or other enhancements have been applied.

When to sharpen

- Raw Presharpening
  - Initial step in workflow.
  - Application of an unagressive amount of sharpening to give the image the intended appearance on your monitor.
  - Sharpening to taste.
  - Voluntary.

When to sharpen

- Output sharpening
  - Sharpening for your specific output format.
  - Dependent on:
    - Whether image is for web or print.
    - If print, your type of printer.
    - If print, the paper to be used
    - Desired appearance.

When to sharpen

- Output sharpening
  - General hierarchy of sharpening, from least to most
    - Web – Prints on glossy paper – Prints on matte paper
    - Monochrome prints can generally take more sharpening than color.
    - Portraits require very careful sharpening.
      - Prime candidate for selective sharpening.

When to sharpen

- Output sharpening
  - Remember, sharpening is largely a matter of artistic intent and personal taste.

Selective Sharpening

- Sharpening is VERY important visual cue.
  - So it will have a very strong role in directing the viewer's attention.
  - You want to make sure that your sharpening is helping you direct viewer's attention where you want it.
  - Don't want it working against you.
  - Often, the solution is to sharpen only portions of the photo.

Selective Sharpening

- Methods
  - Sharpening tool
  - Erasing Technique
  - Masking Technique

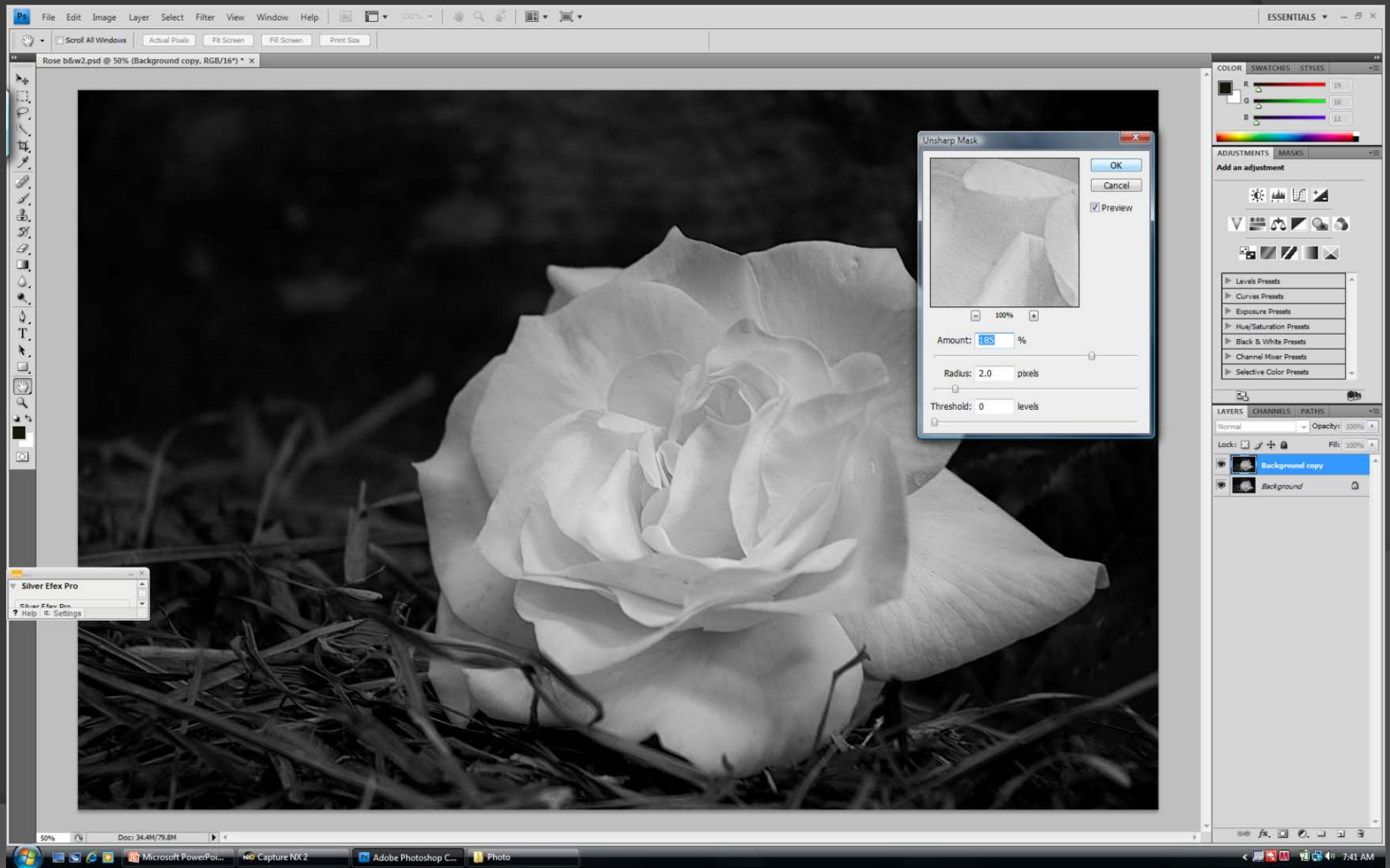
Selective Sharpening

- Methods
  - Sharpening tool
    - Quickest and easiest
    - Least ability to make adjustments
  - Erasing Technique
    - More complicated but adjustable
  - Masking Technique
    - More complicated but most flexibility

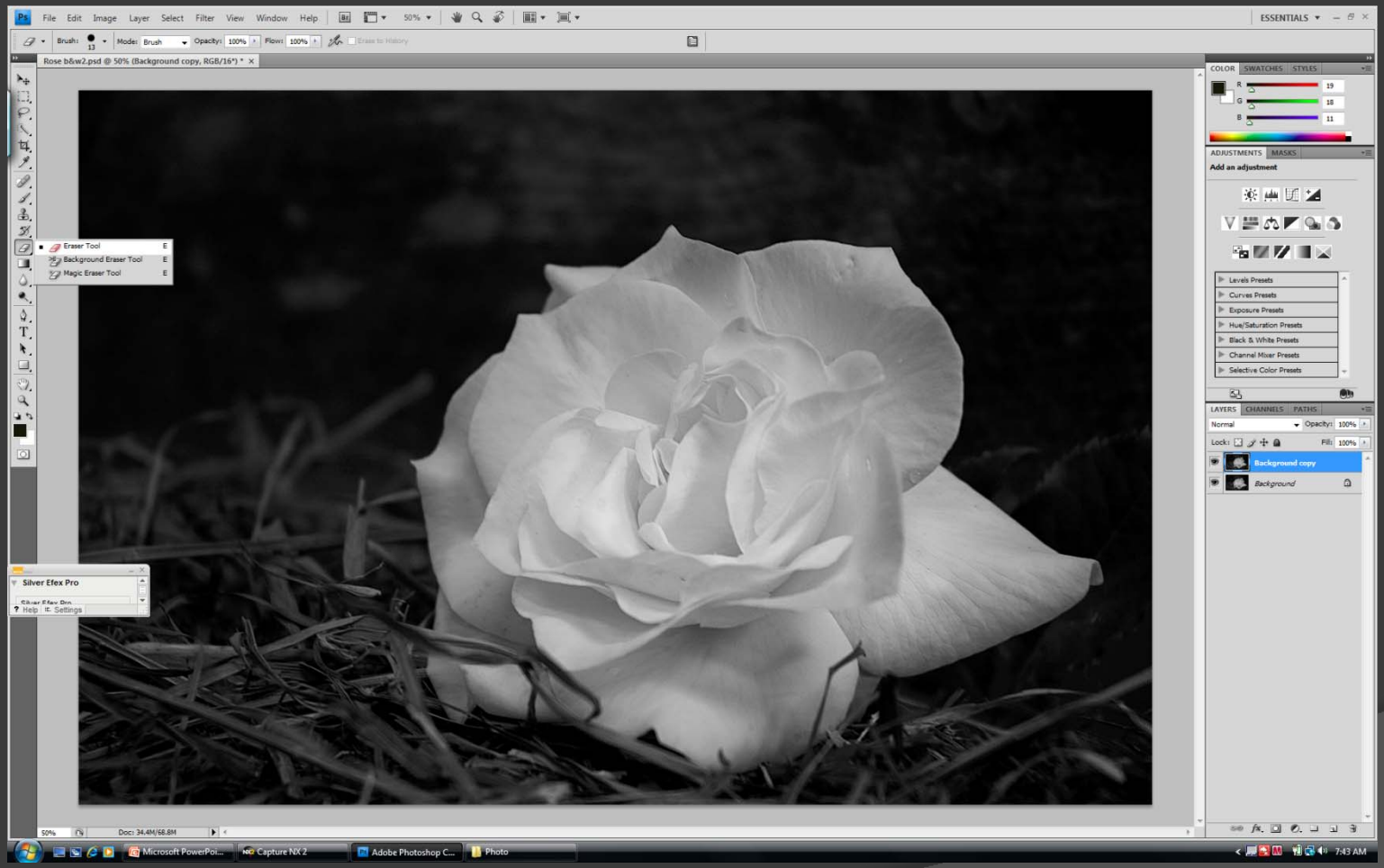
SS: Sharpening Tool

SS: Sharpening Tool

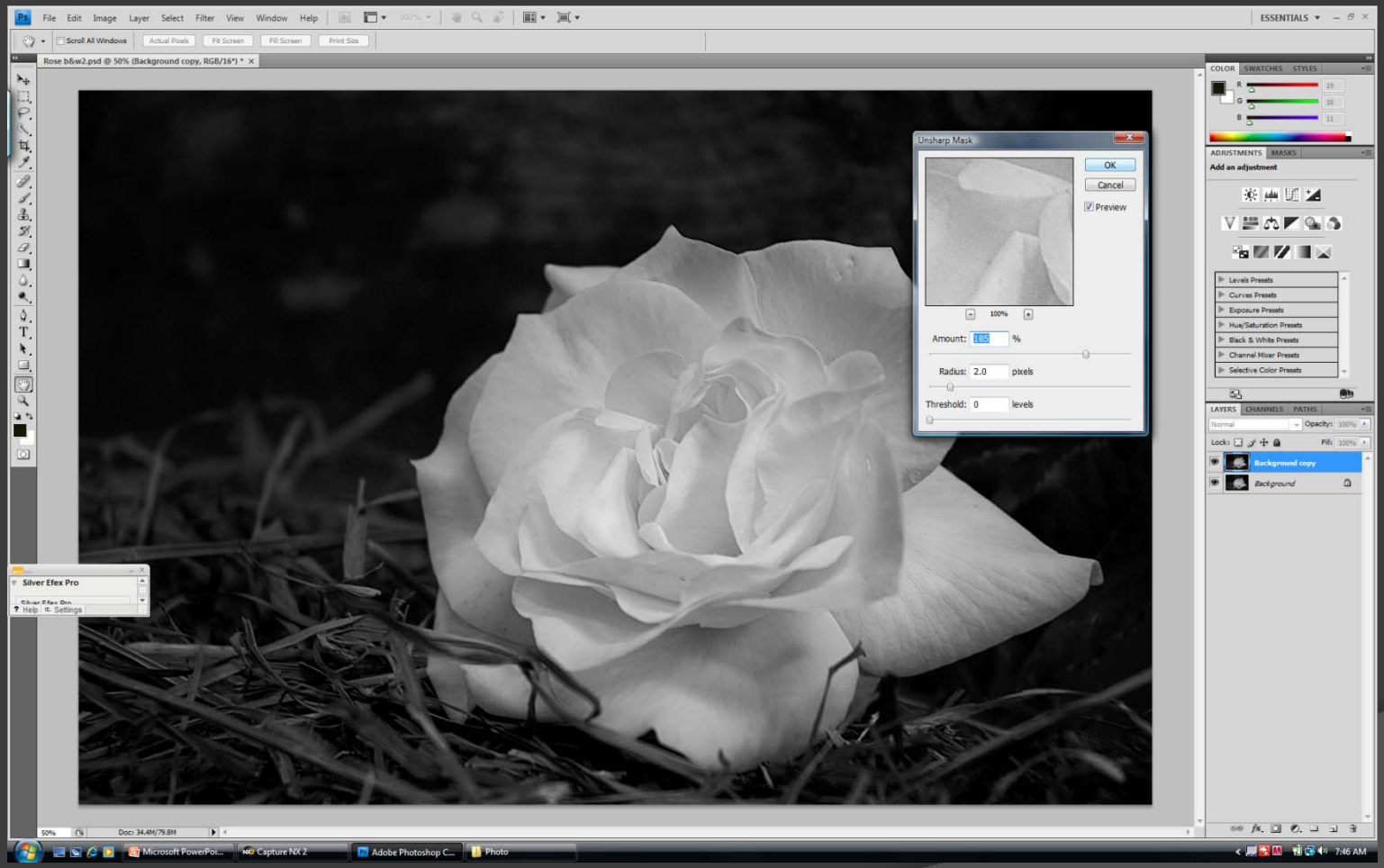
SS: Erase Technique
Duplicate & Sharpen



SS: Erase Technique
Erase areas to unsharpen



SS: Mask Technique
Duplicate & Sharpen



SS: Mask Technique
Add Layer Mask

SS: Mask Technique
Use paint brush

SS: Mask Technique

- Because the sharpening is done on a separate layer, you can adjust the opacity of the layer or blending mode.
  - Opacity – allows you to be more aggressive in sharpening but reduce the effect by lowering opacity.
  - Blending mode – changing to Luminosity will prevent saturation and color shifts.

SS: Mask Technique

- Because the sharpening is done on a separate layer, you can adjust the opacity of the layer or blending mode.
- Black conceals, white reveals.
  - Almost infinite flexibility to go back and adjust the mask for the perfect amounts of sharpening in desired areas.

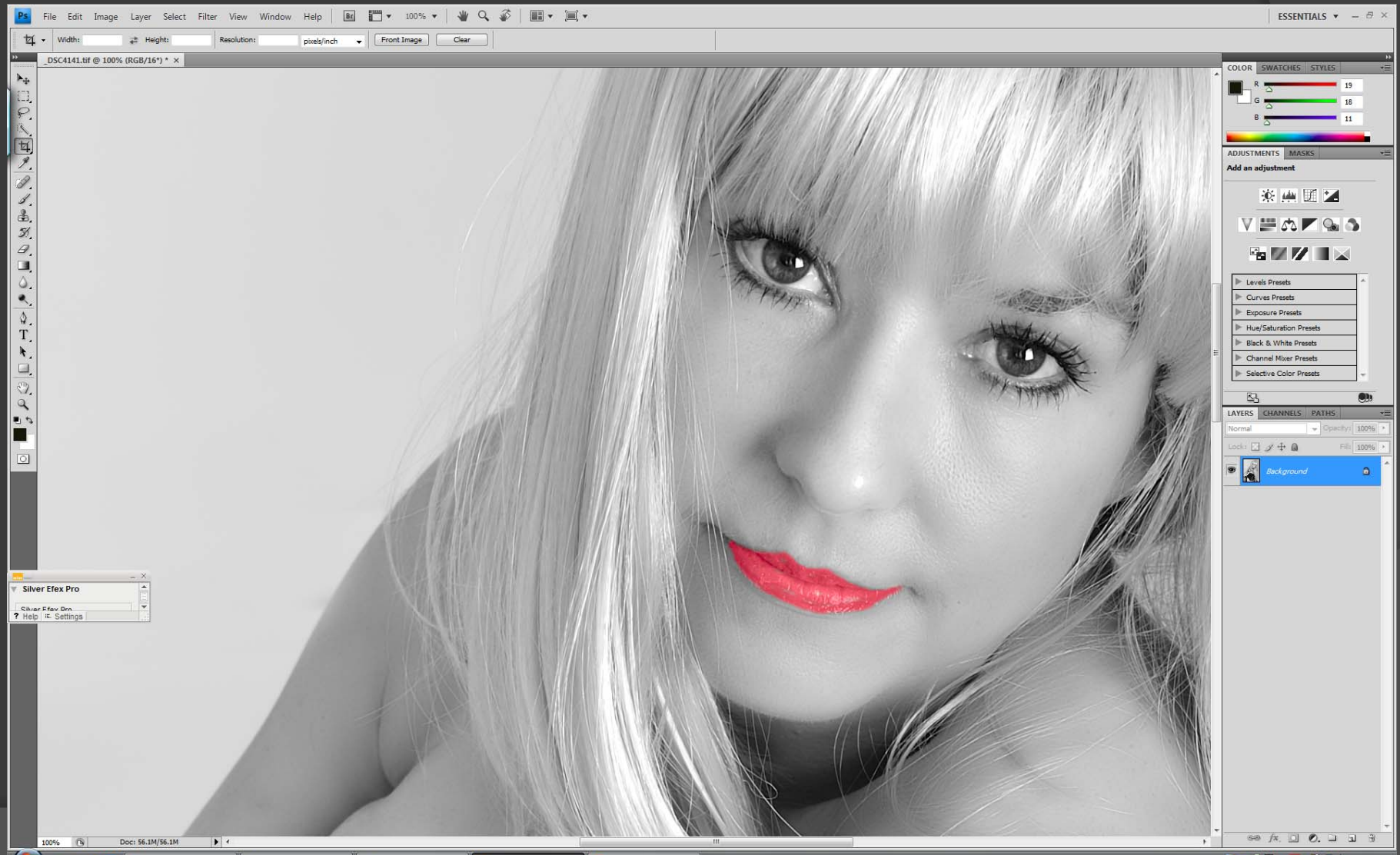
SS: Portraits

- Most times, you do not want to globally sharpen portraits.
  - It will enhance ALL skin imperfections.
  - You will end up with an extremely bad reputation (particularly among women).

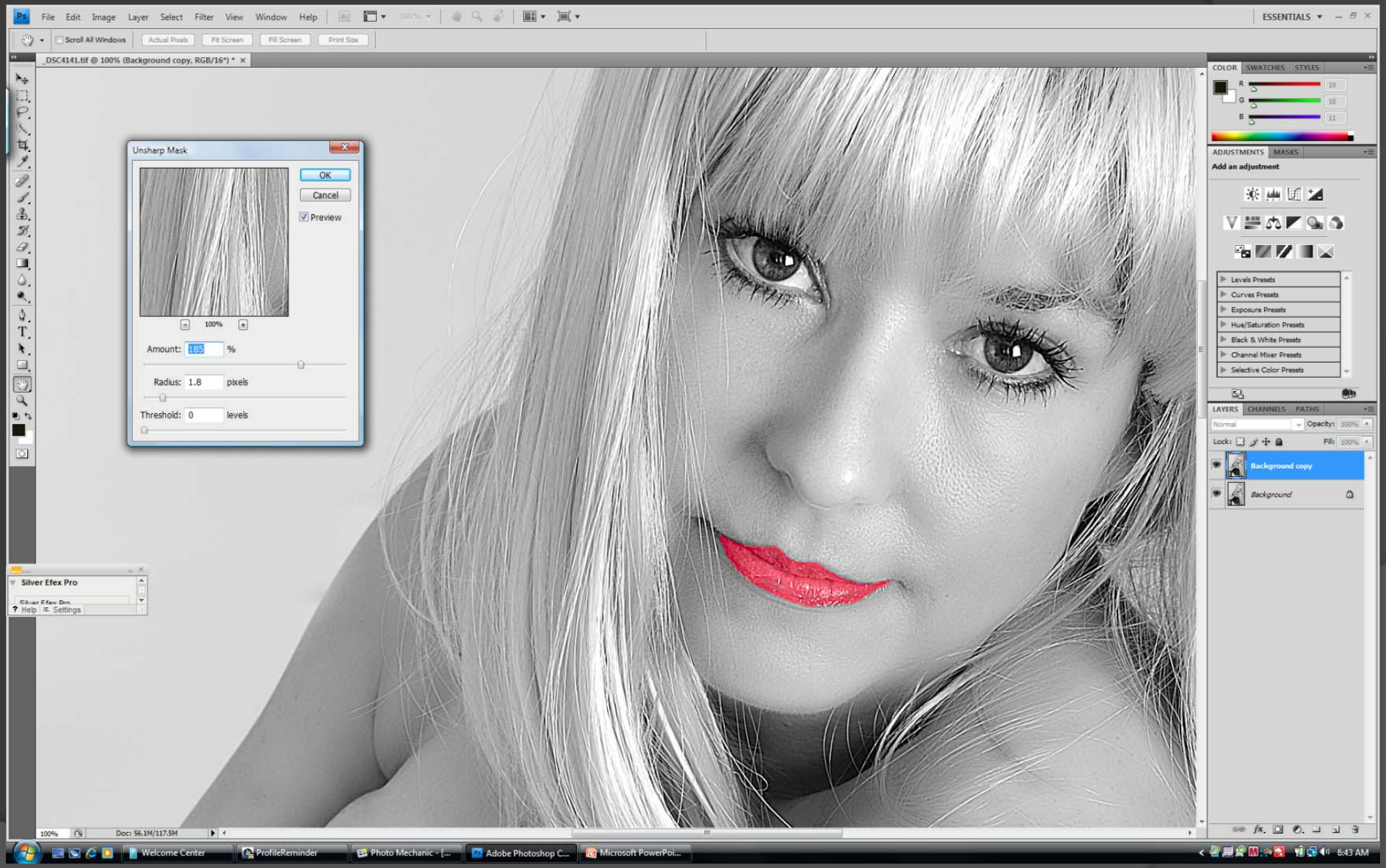
SS: Portraits

- Most times, you do not want to globally sharpen portraits.
- Sharpening Strategy for Portraits:
  - Want to sharpen what the viewers expect should be sharp.
    - Eyes
    - Lips
    - Jewelry
    - Maybe nostrils

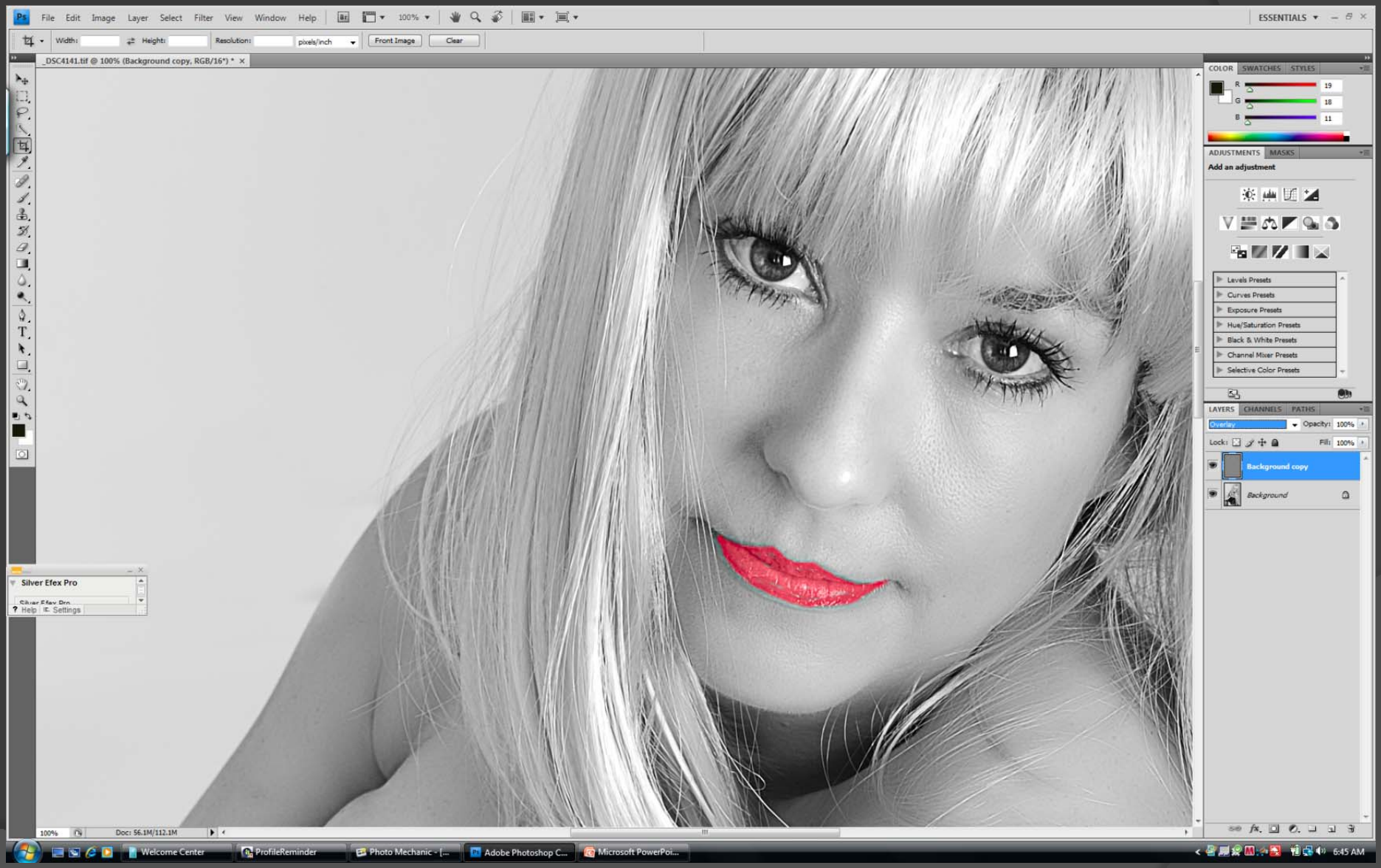
Portraits: B&W, Curves, Skin Softening



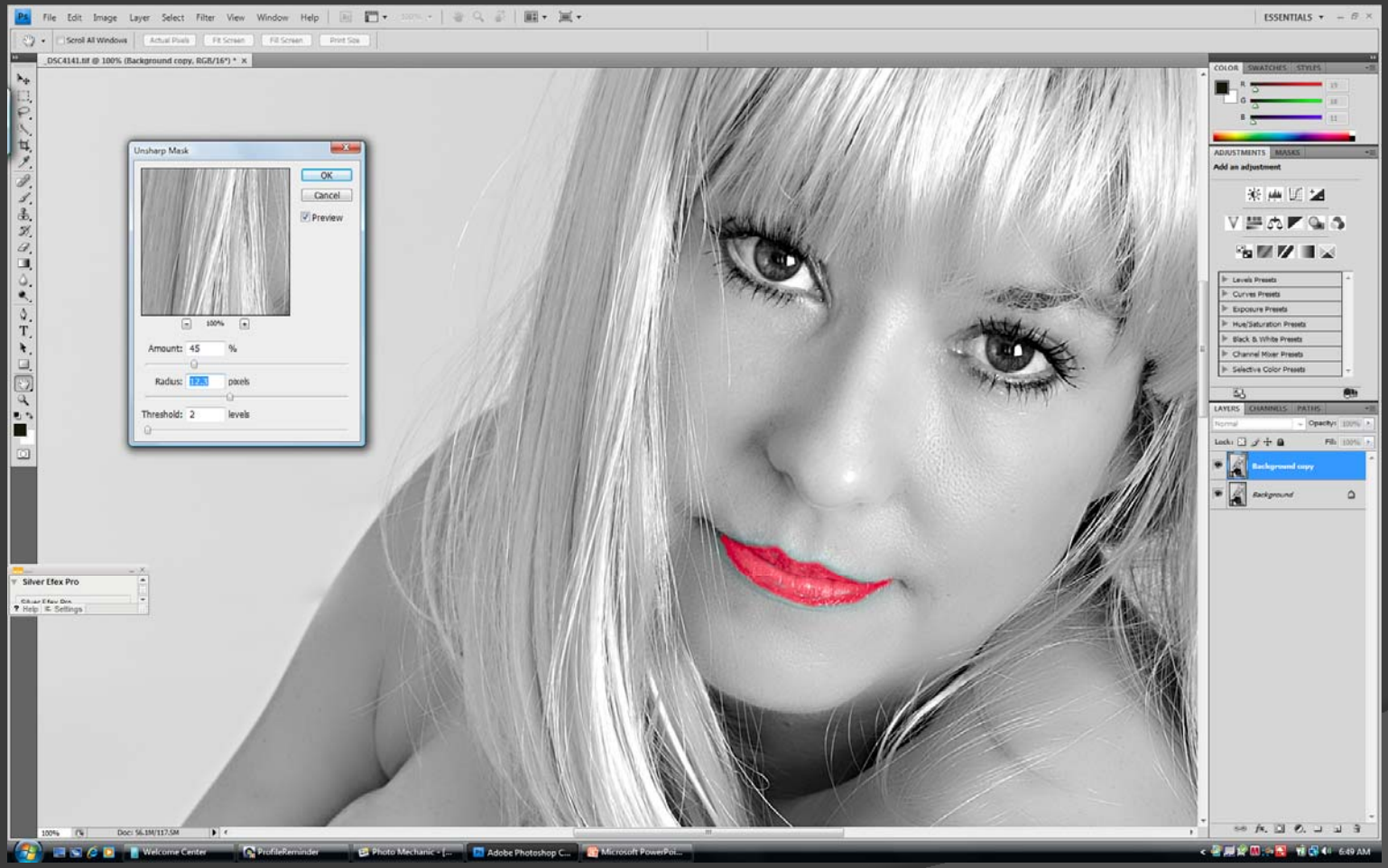
Portraits: Global USM



Portraits: Global HP



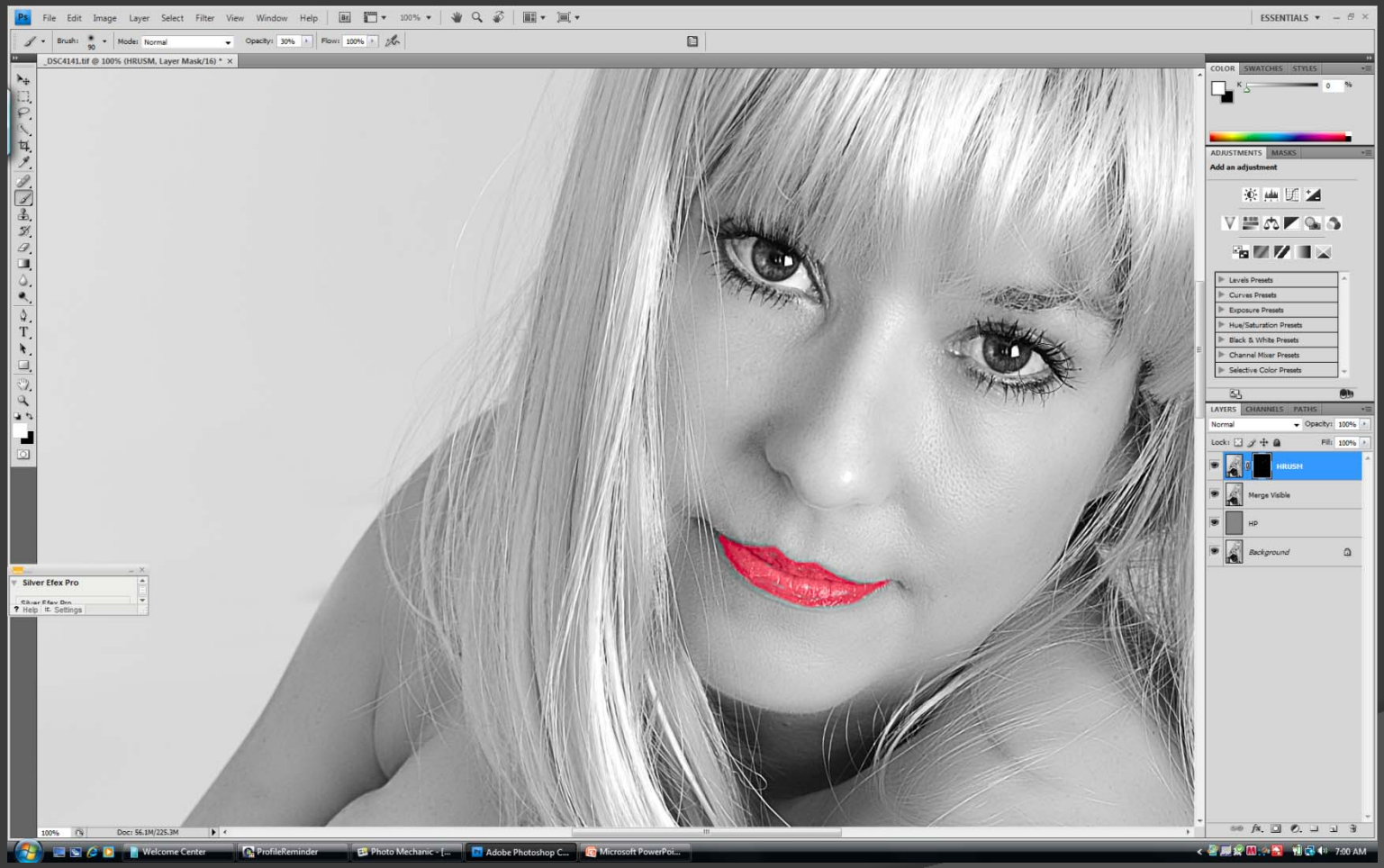
Portraits: HRUSM



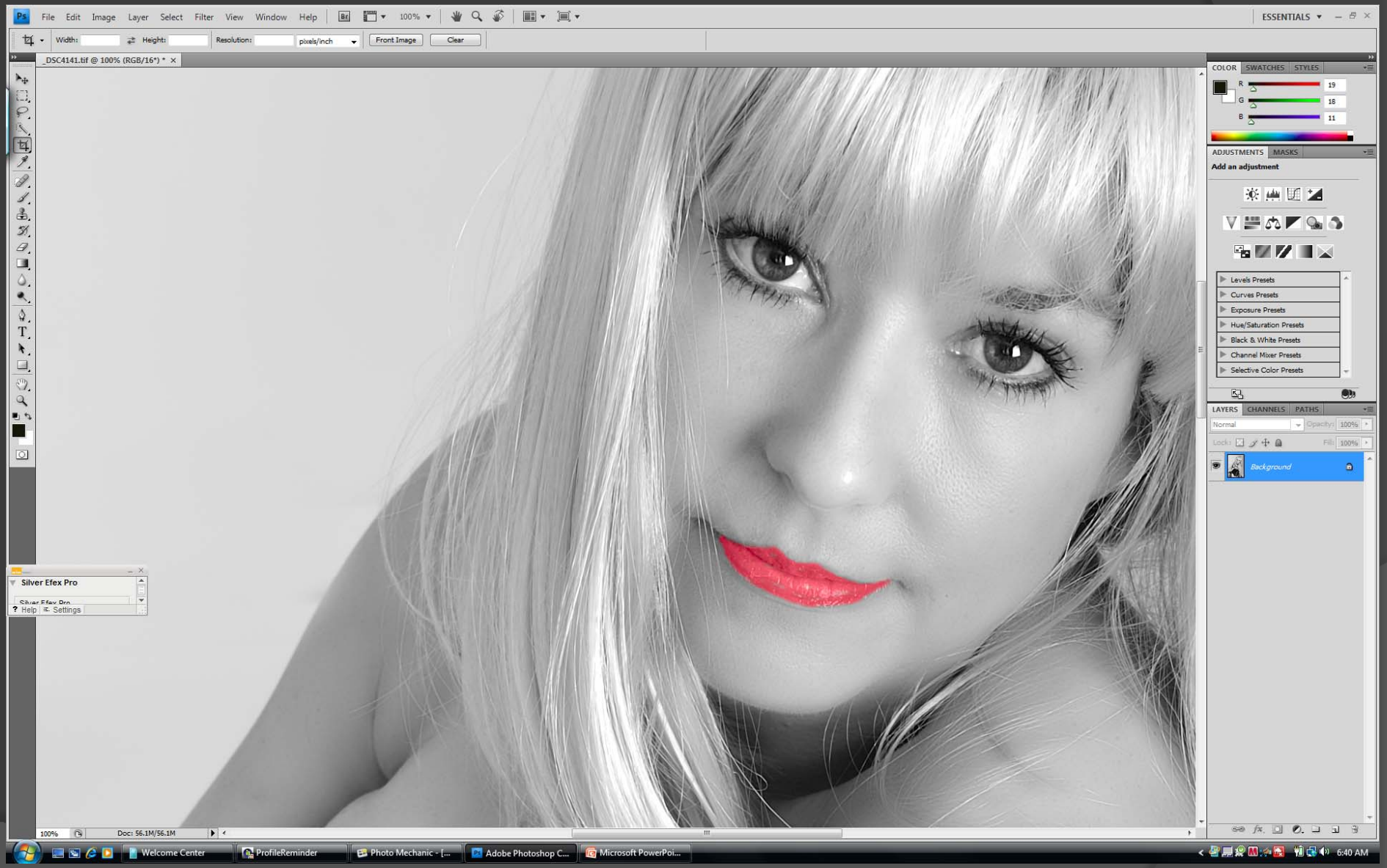
Portraits: The Problem

- The HP sharpening leaves the skin softer.
- But the HRUSM makes the eyes and lips pop more.
- Solution – Use the HP sharpening globally, apply the HRUSM selectively to eyes and lips.

Portraits: The Solution



Before


File Edit Image Layer Select Filter View Window Help
ESSENTIALS
Width: Height: Resolution: pixels/inch Front Image Clear
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COLOR SWATCHES STYLES
R 19
G 18
B 11
ADJUSTMENTS MASKS
Add an adjustment
Levels Presets
Curves Presets
Exposure Presets
Hue/Saturation Presets
Black & White Presets
Channel Mixer Presets
Selective Color Presets
LAYERS CHANNELS PATHS
Normal Opacity: 100%
Lock: Fill: 100%
Background
Silver Efex Pro
Help Settings
100% Doc: 56.1M/56.1M
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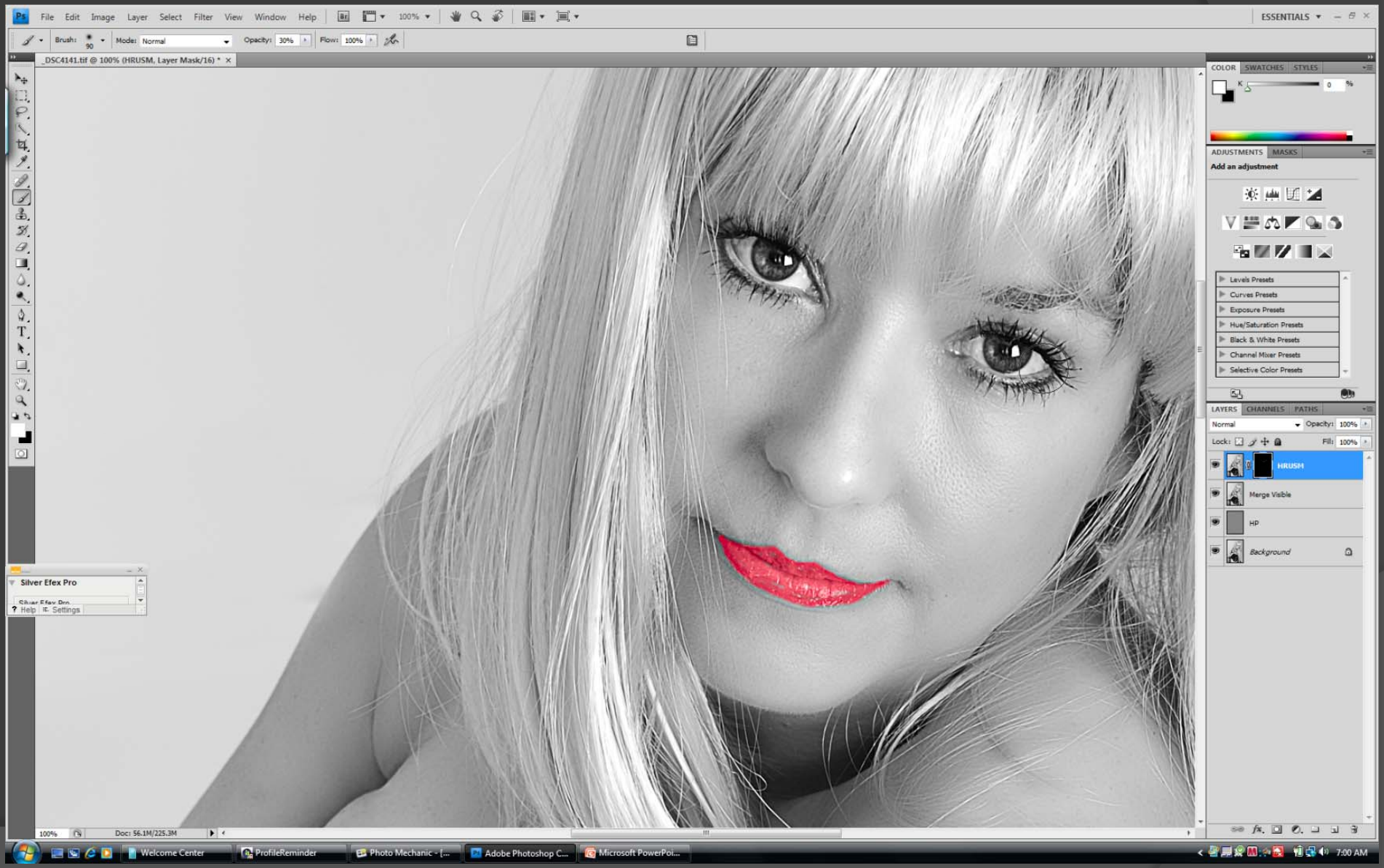
ProfileReminder
Photo Mechanic - [...
Adobe Photoshop C...
Microsoft PowerPoi...
6:40 AM

After


File Edit Image Layer Select Filter View Window Help
ESSENTIALS
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COLOR SWATCHES STYLES
ADJUSTMENTS MASKS
Add an adjustment
Levels Presets
Curves Presets
Exposure Presets
Hue/Saturation Presets
Black & White Presets
Channel Mixer Presets
Selective Color Presets
LAYERS CHANNELS PATHS
Normal
Opacity: 100%
Fill: 100%
HRUSM
Merge Visible
HP
Background
Silver Efex Pro
Help Settings
Doc: 56.1M/225.3M
Welcome Center
ProfileReminder
Photo Mechanic - [...
Adobe Photoshop C...
Microsoft PowerPoi...
7:00 AM

Side Effects

- Remember, sharpening involves a contrast enhancement.
  - Enhancing contrast generally results in an increase in saturation.
- Sharpening generally enhances noise.
- Oversharpening results in halos.

Side Effects

- For this reason, effects of sharpening should always be evaluated at 100%.

Side Effects: Saturation

- Can be a beneficial side effect providing pop to your photo.
- BUT – What if you have your colors exactly how you want them but still need some sharpening.

Side Effects: Saturation

- Sharpening without saturation effects:
  - Apply sharpening, reduce saturation.
  - Sharpen on a new layer, change blending mode to Luminosity.
  - Sharpen on the Lightness channel in LAB color mode.

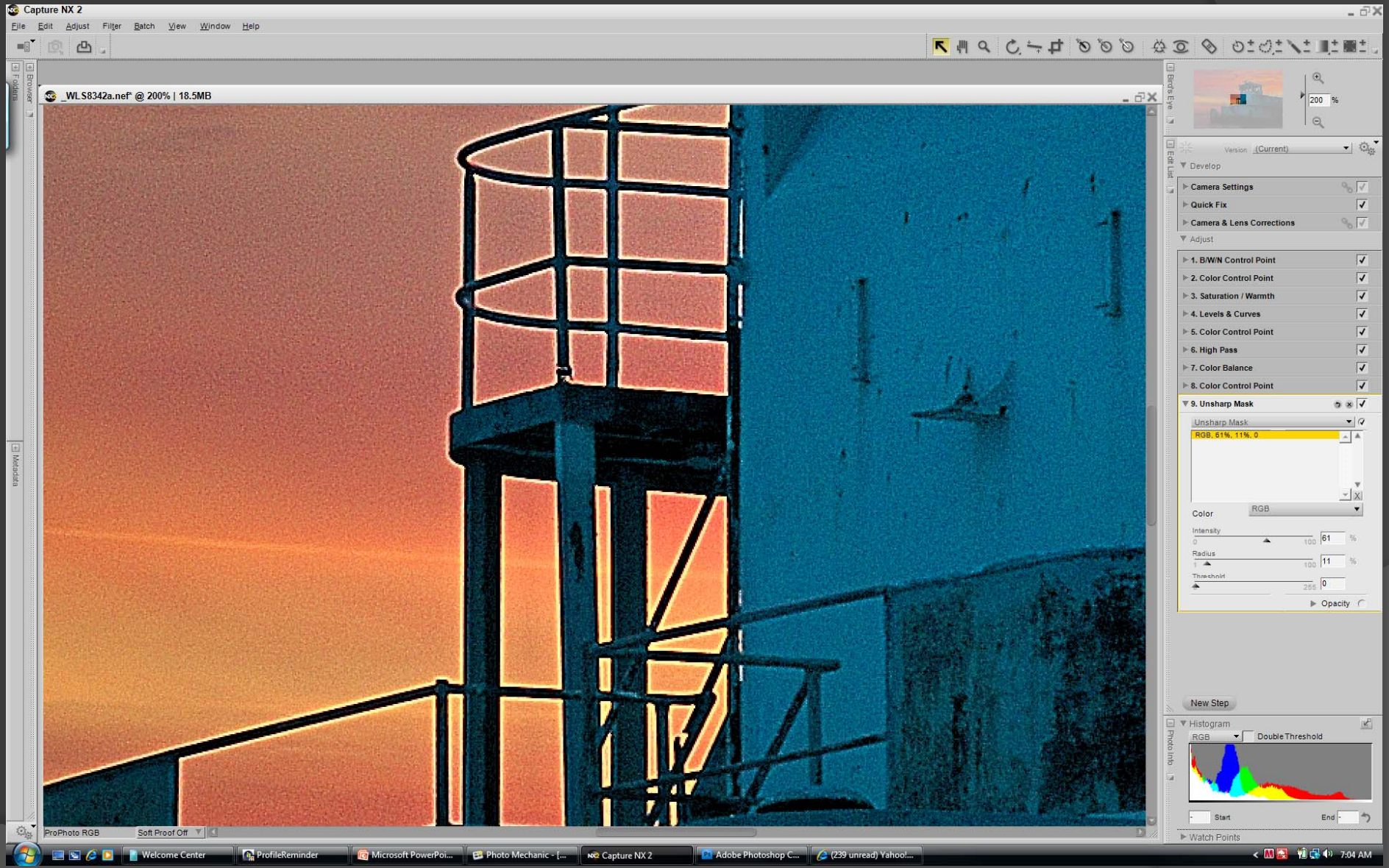
Side Effects: Noise

- Strategies to avoid enhancing noise:
  - Review the Red, Green & Blue channels, sharpen on least noisy channel.
  - Sharpen on the Lightness channel in LAB mode.
  - Selectively sharpen, masking out effects in noisy areas.
  - Try High Radius USM or High Pass sharpening rather than USM.

Side Effects: Halos

Side Effects: Halos

Side Effects: Halos



Side Effects:

- Always examine your photo at 100% or more to check for sharpening artifacts.
- Remember minimal to moderate artifacts at this size may not show up in most prints.

THE END?