

The Arcane & Mystical Knowledge

SHARPENING

Sharpening: What is it?

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

Sharpening Methods

⦿ Unsharp Mask (USM)

- 3 Parameters

- Amount

- The amount of contrast added to edges.
- Usually expressed as a percentage.

- Radius

- Threshold

Sharpening Methods

◎ Unsharp Mask (USM)

- 3 Parameters

- Amount

- The amount of contrast added to edges.
- Usually expressed as a percentage.

- Radius

- The number of pixels from an edge that are affected.

- Threshold

Sharpening Methods

◎ Unsharp Mask (USM)

• 3 Parameters

○ Amount

- The amount of contrast added to edges.
- 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

The screenshot displays the Adobe Photoshop interface with the Unsharp Mask dialog box open. The main canvas shows a close-up of purple flowers with water droplets. The Unsharp Mask dialog box is centered, showing a preview of the image with a dark mask overlay. The settings are: Amount: 185%, Radius: 1.8 pixels, and Threshold: 0 levels. The 'Preview' checkbox is checked. The background panel on the right shows the 'ADJUSTMENTS' and 'LAYERS' panels. The 'LAYERS' panel shows a single layer named 'Background'. The 'ADJUSTMENTS' panel shows various adjustment options like Levels, Curves, Exposure, etc. The top menu bar includes File, Edit, Image, Layer, Select, Filter, View, Window, and Help. The bottom status bar shows the zoom level at 33.33% and document size at 34.5M/34.5M.

Unsharp Mask

Amount: 185 %

Radius: 1.8 pixels

Threshold: 0 levels

OK

Cancel

Preview

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% to 175%
 - 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

- 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 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.

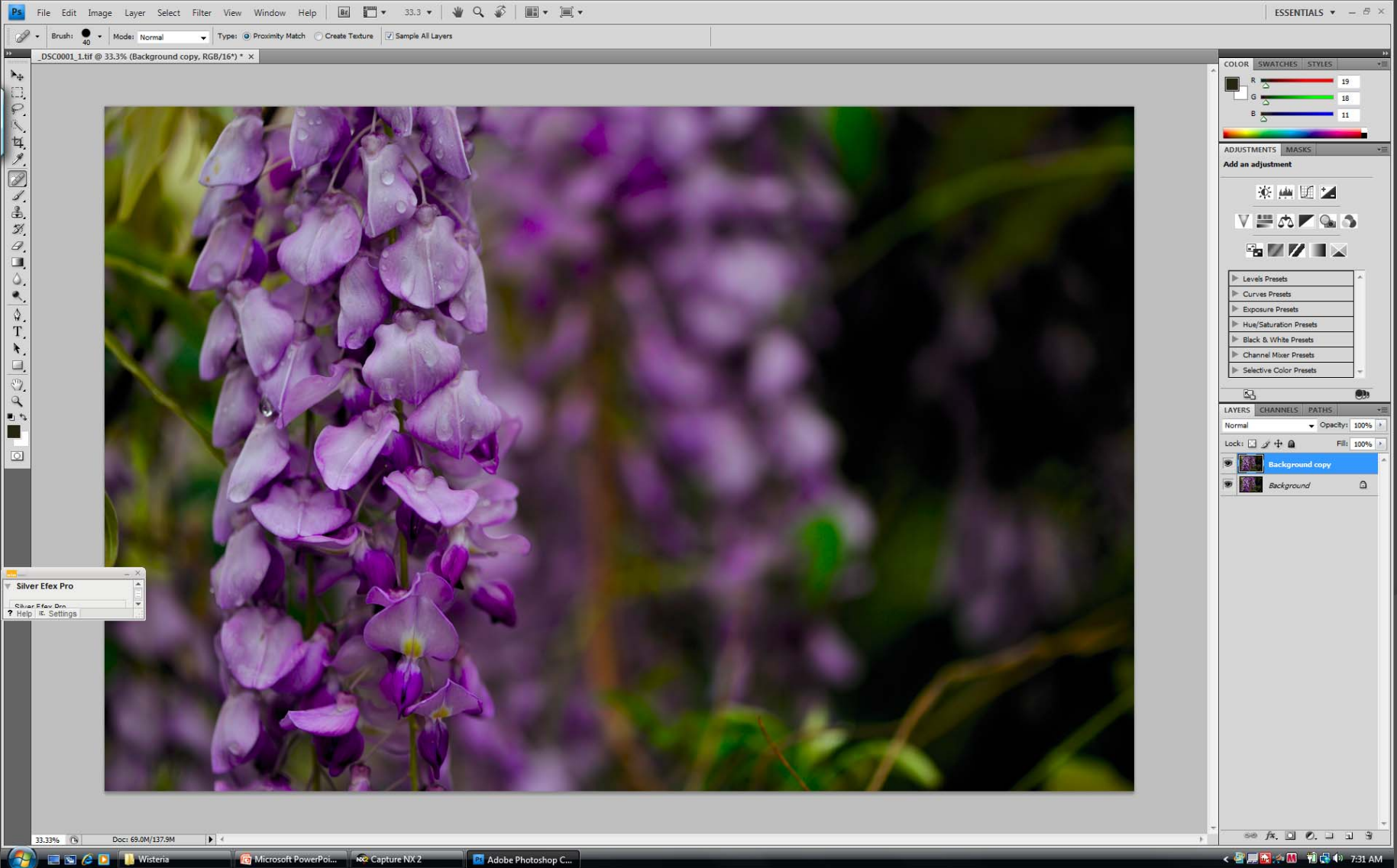
Sharpening Methods

⦿ High Pass Filter Sharpening

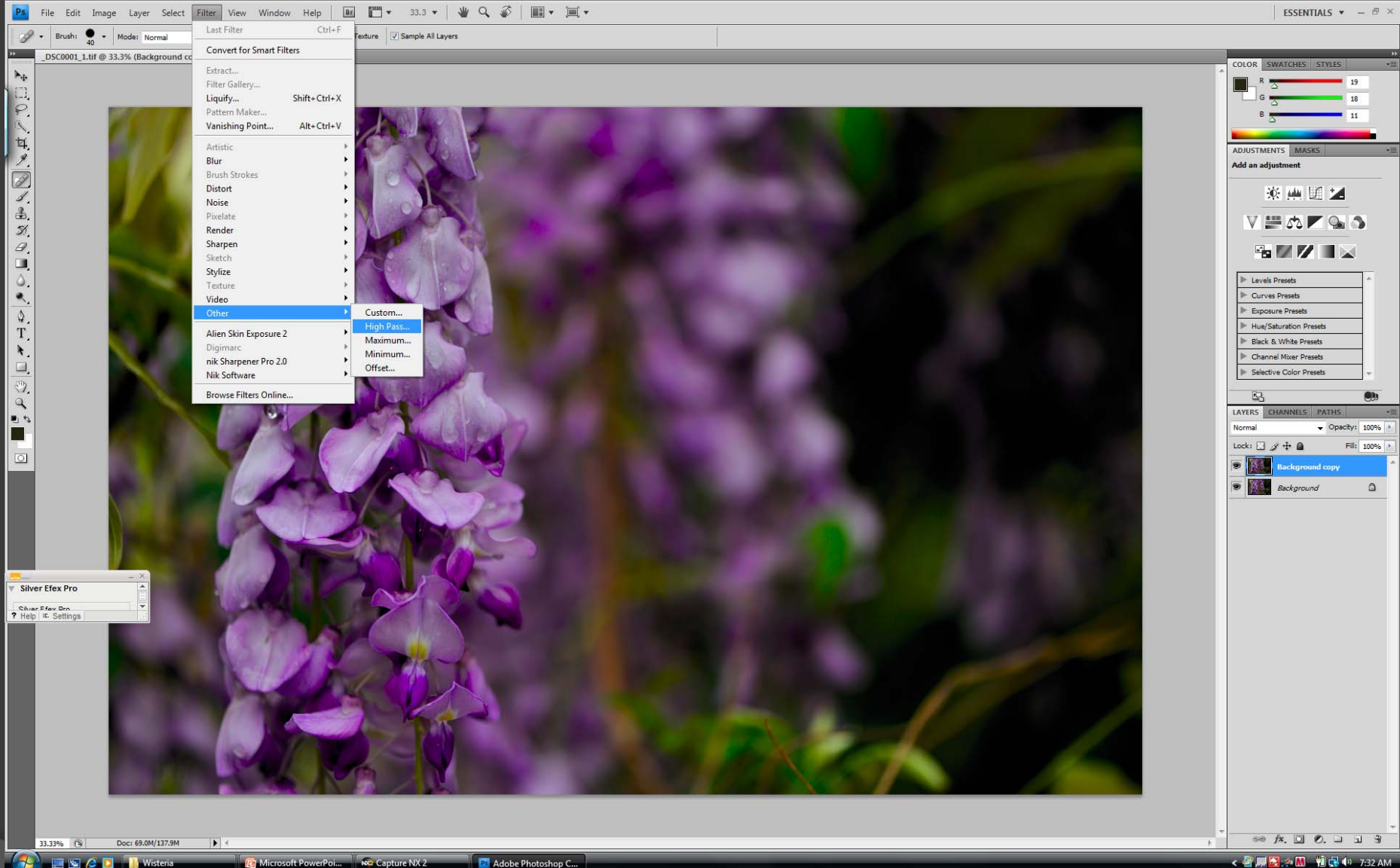
- Steps:

- 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.

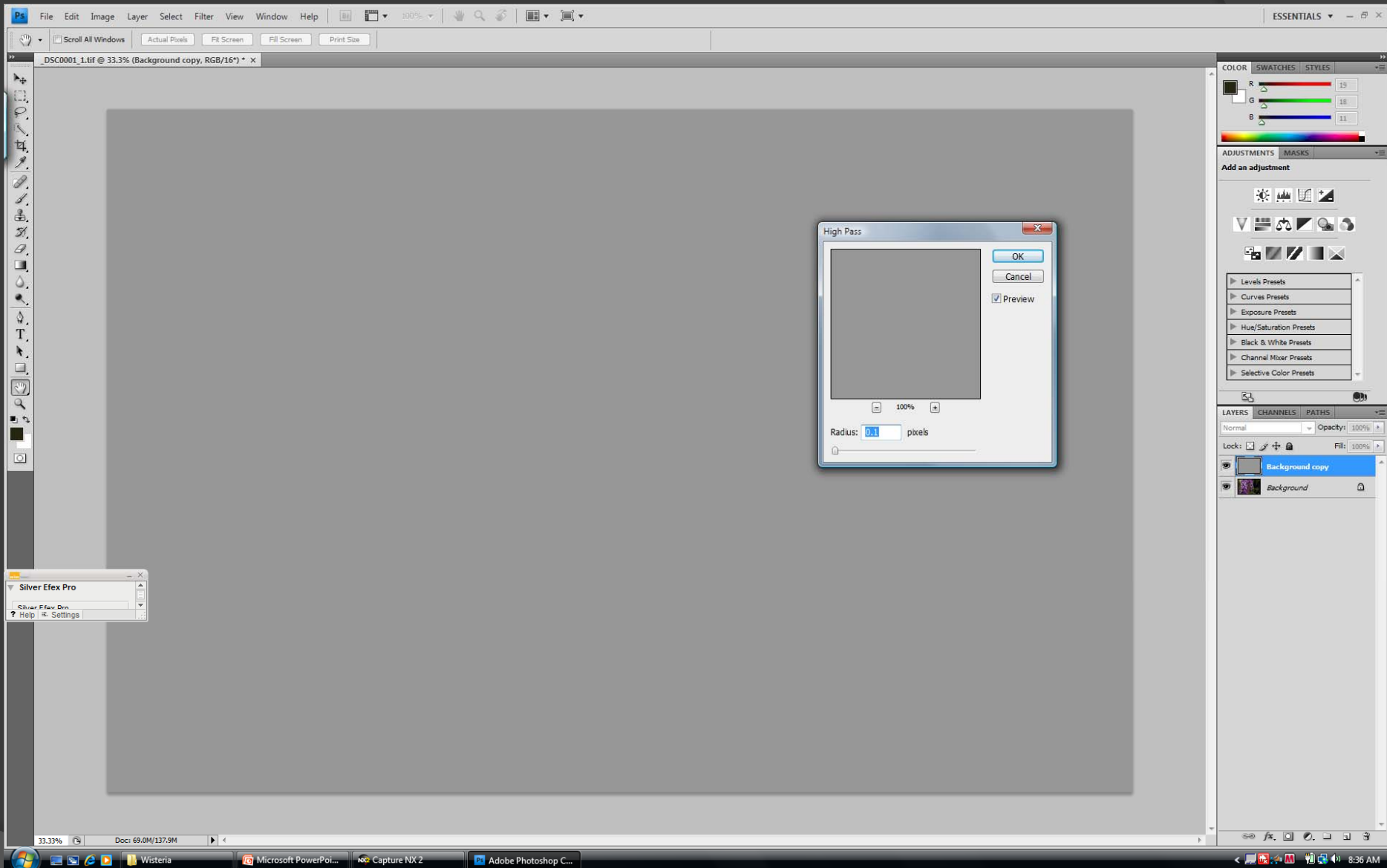
HPS: Duplicate Layer



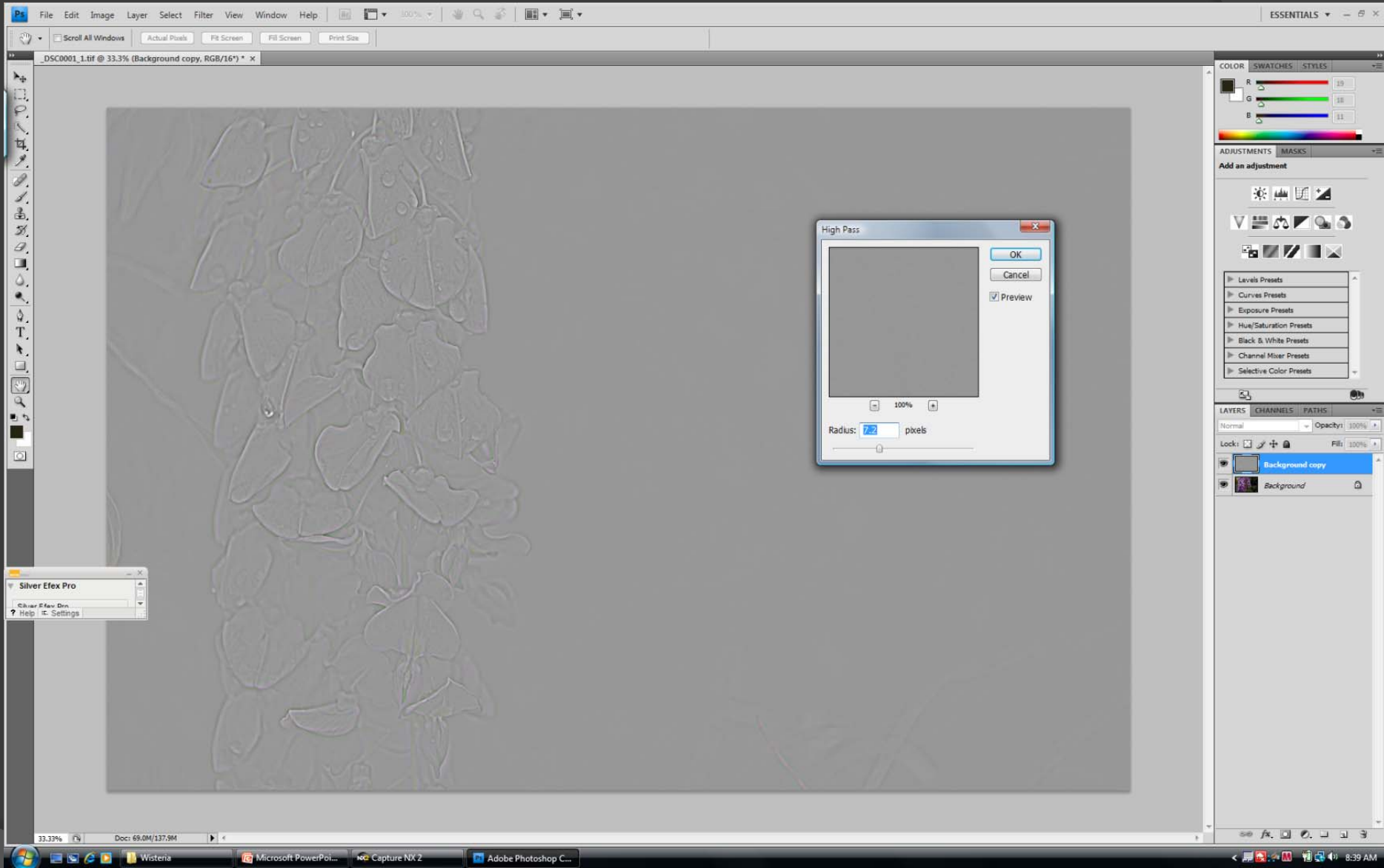
HPS: Select the Filter



HPS: Apply the Filter



HPS: Adjust the Radius



HPS: Adjust the Radius 2

The screenshot displays the Adobe Photoshop interface with a photograph of purple flowers. The 'High Pass' dialog box is open, showing a preview of the image with a high-pass effect. The 'Radius' is set to 57.4 pixels. The 'Preview' checkbox is checked. The 'Layers' panel on the right shows a 'Background copy' layer selected. The 'Adjustments' panel on the right is also visible, showing various adjustment options. The Photoshop title bar indicates the file is 'DSC0001_1.tif @ 33.3% (Background copy, RGB/16*) * X'.

High Pass

OK

Cancel

Preview

Radius: 57.4 pixels

33.33% Doc: 69.0M/137.9M

Silver Efex Pro

Silver Efex Pro

Help Settings

ESSENTIALS

File Edit Image Layer Select Filter View Window Help

Scroll All Windows Actual Pixels Fit Screen Fill Screen Print Size

DSC0001_1.tif @ 33.3% (Background copy, RGB/16*) * X

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 copy

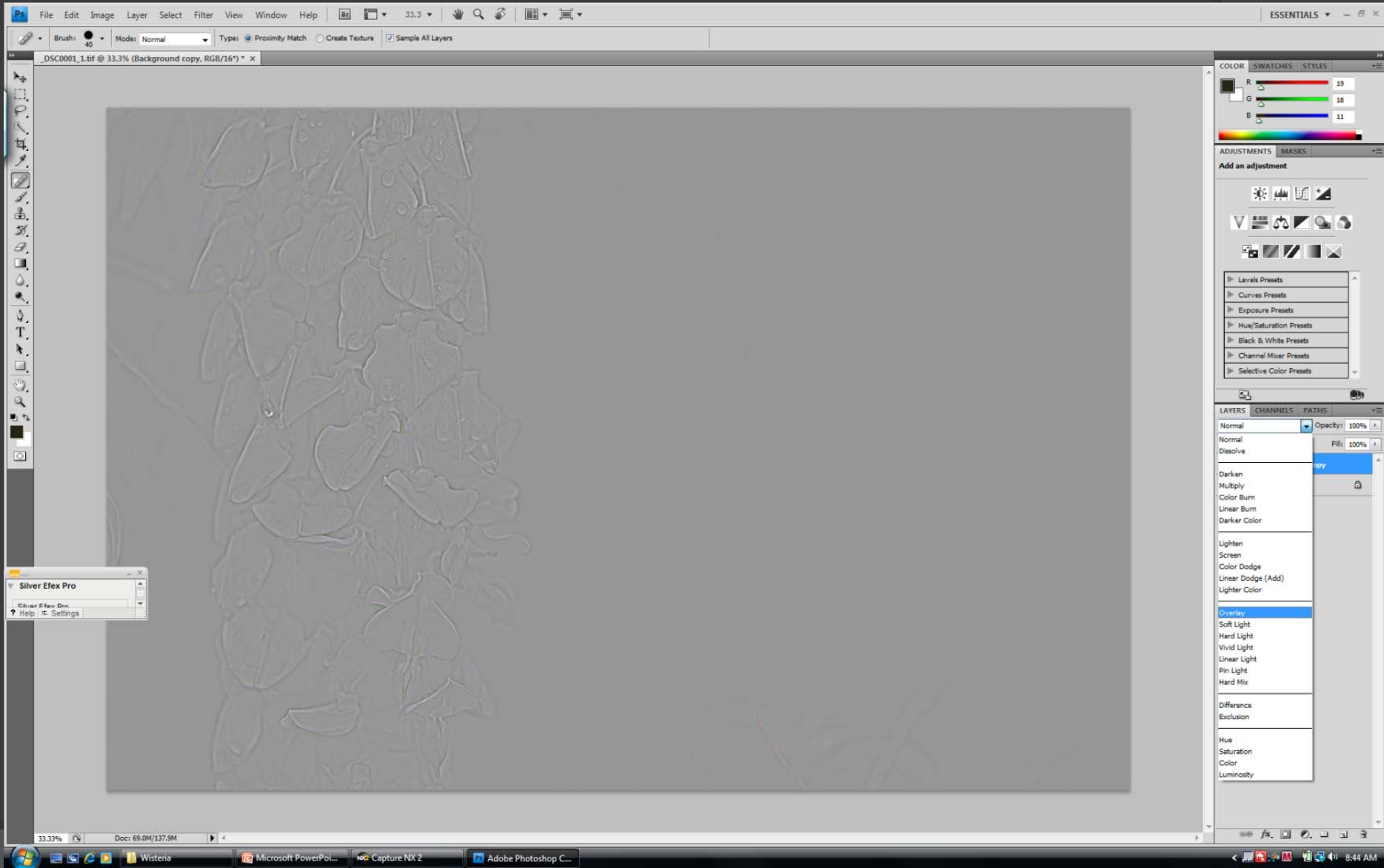
Background

33.33% Doc: 69.0M/137.9M

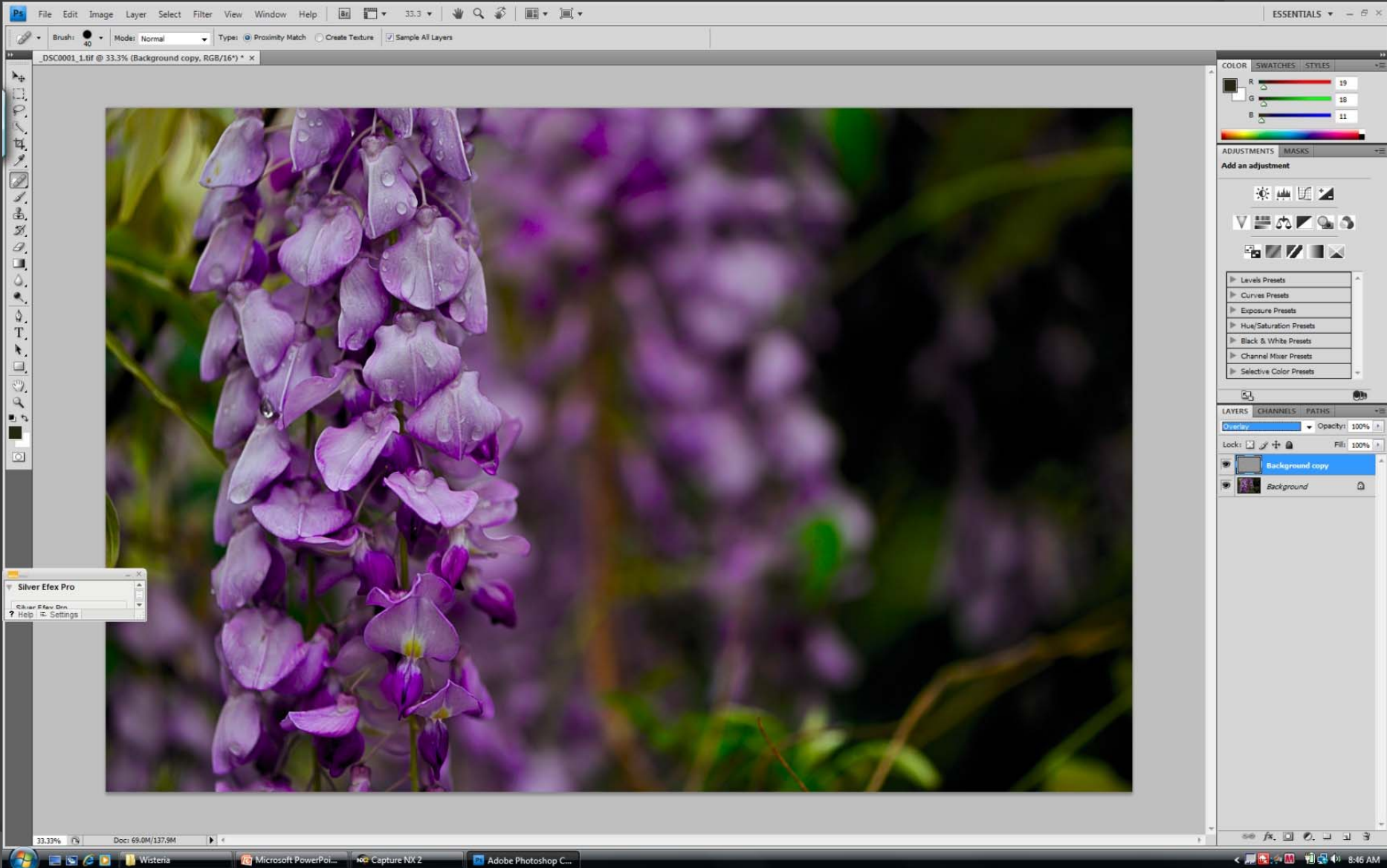
Wisteria Microsoft PowerPoi... Capture NX 2 Adobe Photoshop C...

8:40 AM

HPS: Select Overlay



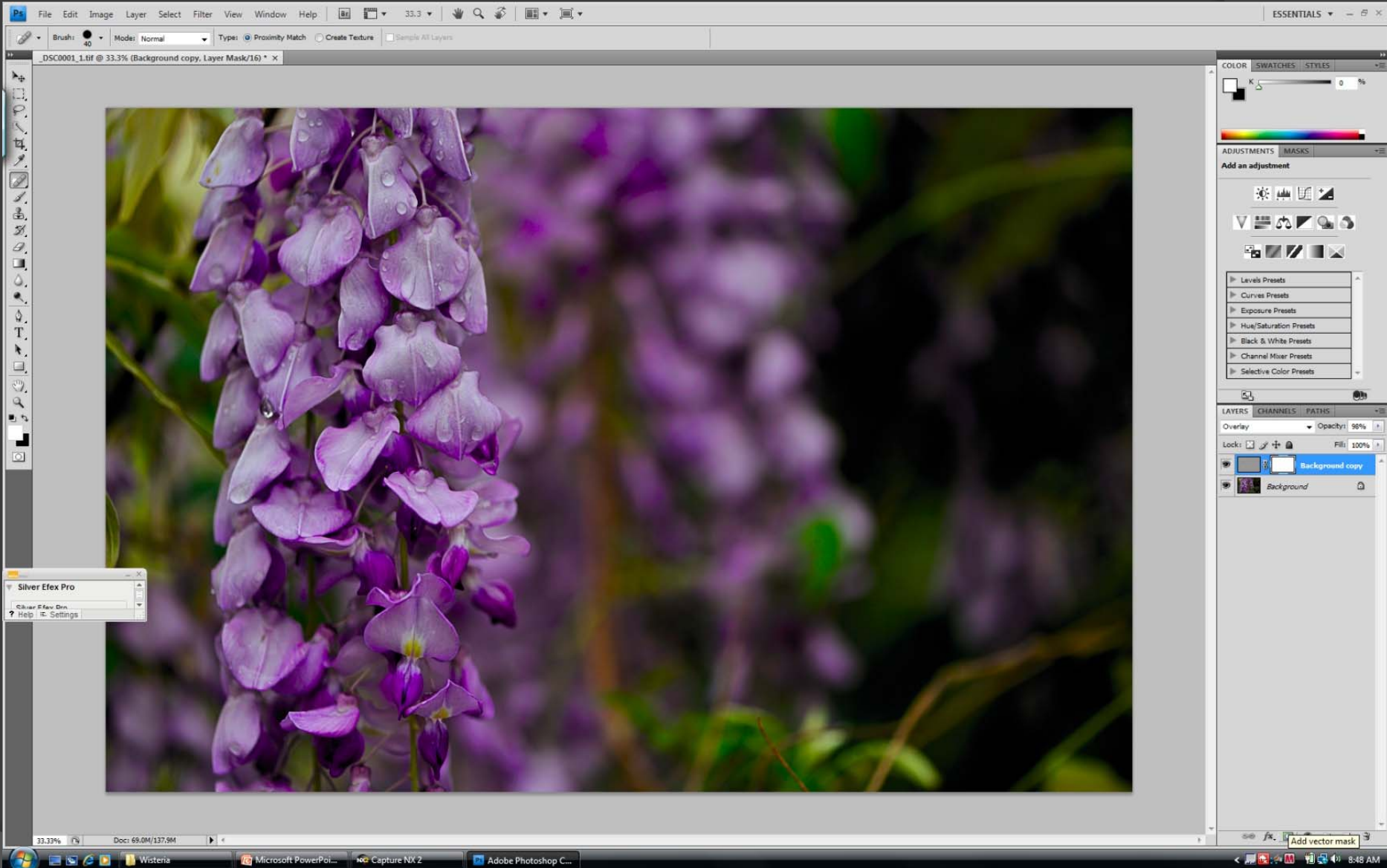
HPS: Result



HPS: Opacity

The screenshot displays the Adobe Photoshop CS6 interface. The main canvas shows a close-up photograph of a purple flower stem with water droplets. The top menu bar includes File, Edit, Image, Layer, Select, Filter, View, Window, and Help. The top toolbar shows the Brush tool selected with a size of 40, Mode set to Normal, and Type set to Proximity Match. The title bar indicates the document is named 'DSC0001_1.tif @ 33.3% (Background copy, RGB/16*)'. On the right side, the Layers panel is open, showing two layers: 'Background copy' (selected) and 'Background'. The 'Background copy' layer has its Opacity set to 62%. The Properties panel on the right shows the Color panel with RGB values of R: 19, G: 18, and B: 11. The Adjustments panel is also visible, showing various adjustment options. A small 'Silver Efex Pro' dialog box is open in the bottom-left corner. The Windows taskbar at the bottom shows the system tray with the time 8:47 AM and the taskbar icons for Wisterna, Microsoft PowerPoint, Capture NX 2, and Adobe Photoshop CS6.

HPS: Mask



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.

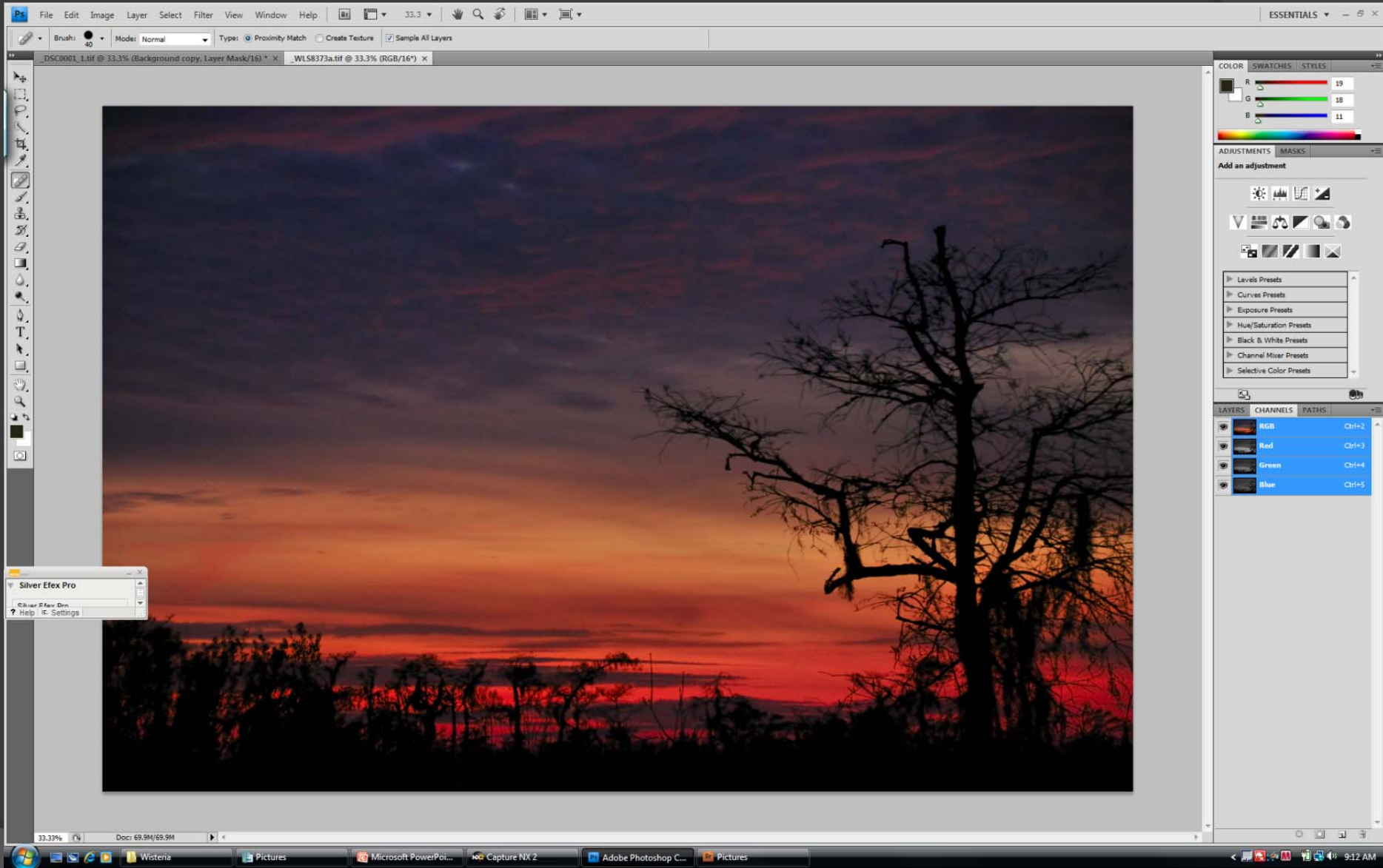
Sharpening Methods

◎ 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

The screenshot displays the Adobe Photoshop CS3.3 interface. The main canvas shows a grayscale image of a tree silhouette against a cloudy sky. The Photoshop interface includes the top menu bar (File, Edit, Image, Layer, Select, Filter, View, Window, Help), toolbars, and various panels on the right side. The Channels panel shows the Red channel selected. The Layers panel shows the RGB, Red, Green, and Blue channels. The Adjustments panel is visible on the right. The Windows taskbar at the bottom shows the system tray with the time 9:13 AM.

Windows taskbar: 33.33% | Doc: 69.9M/69.9M | 9:13 AM

SCS: Examine Blue Channel

The screenshot displays the Adobe Photoshop CS3 interface. The main workspace shows a dark image of a tree silhouette against a cloudy sky. The Channels panel on the right is open, showing the 'Blue' channel selected. The 'Color' panel at the top right shows the RGB values: R: 19, G: 18, B: 11. The 'Layers' panel at the bottom right shows the 'Blue' channel selected. The Windows taskbar at the bottom shows the following applications: Silver Efex Pro, Microsoft PowerPoint, Capture NX 2, Adobe Photoshop CS3, and Pictures. The system tray at the bottom right shows the time as 9:16 AM.

Windows taskbar applications:

- Silver Efex Pro
- Microsoft PowerPoint
- Capture NX 2
- Adobe Photoshop CS3
- Pictures

System tray: 9:16 AM

SCS: Examine Green Channel

The screenshot shows the Adobe Photoshop interface with the following details:

- Top Menu Bar:** File, Edit, Image, Layer, Select, Filter, View, Window, Help.
- Top Panel:** Brush: 40, Mode: Normal, Type: Proximity Match, Create Texture, Sample All Layers.
- Canvas:** Displays a grayscale image of a tree silhouette against a cloudy sky. The image is zoomed to 33.3%.
- Channels Panel (Right):** Shows the 'Green' channel selected. The RGB values are: R=19, G=18, B=11.
- Layers Panel (Right):** Shows the 'Green' channel selected.
- Windows Panel (Bottom Left):** Shows the 'Silver Efex Pro' window open.
- Taskbar (Bottom):** Shows the Windows taskbar with the following icons: Start button, Internet Explorer, Wistaria, Microsoft PowerPoint, Capture NX 2, Adobe Photoshop CS5.5, and Pictures.
- System Tray (Bottom Right):** Shows the system clock at 9:17 AM and the date 10/10/2010.

Sharpening Methods

- ① You can apply most sharpening techniques to an individual channel.
- ① You can also apply many other adjustments to an individual channel.

Sharpening Methods

◎ LAB Sharpening

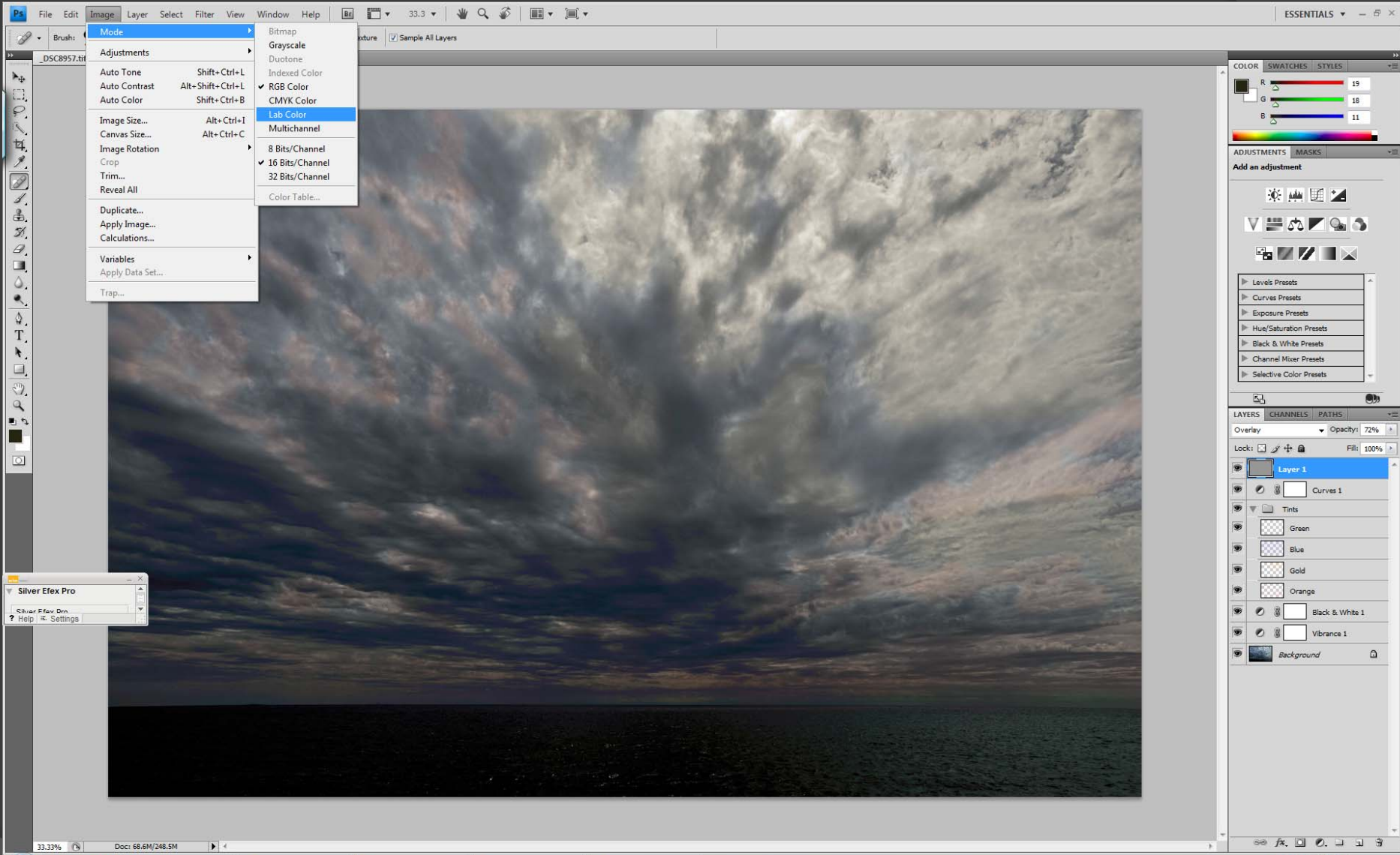
- Takes advantage of the LAB Color Mode.
- LAB is an alternative to RGB.
 - Instead of Red, Green & Blue Channels, it has L (Luminance) and two color channels (A & B)
 - Often, noise in the L channel.

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

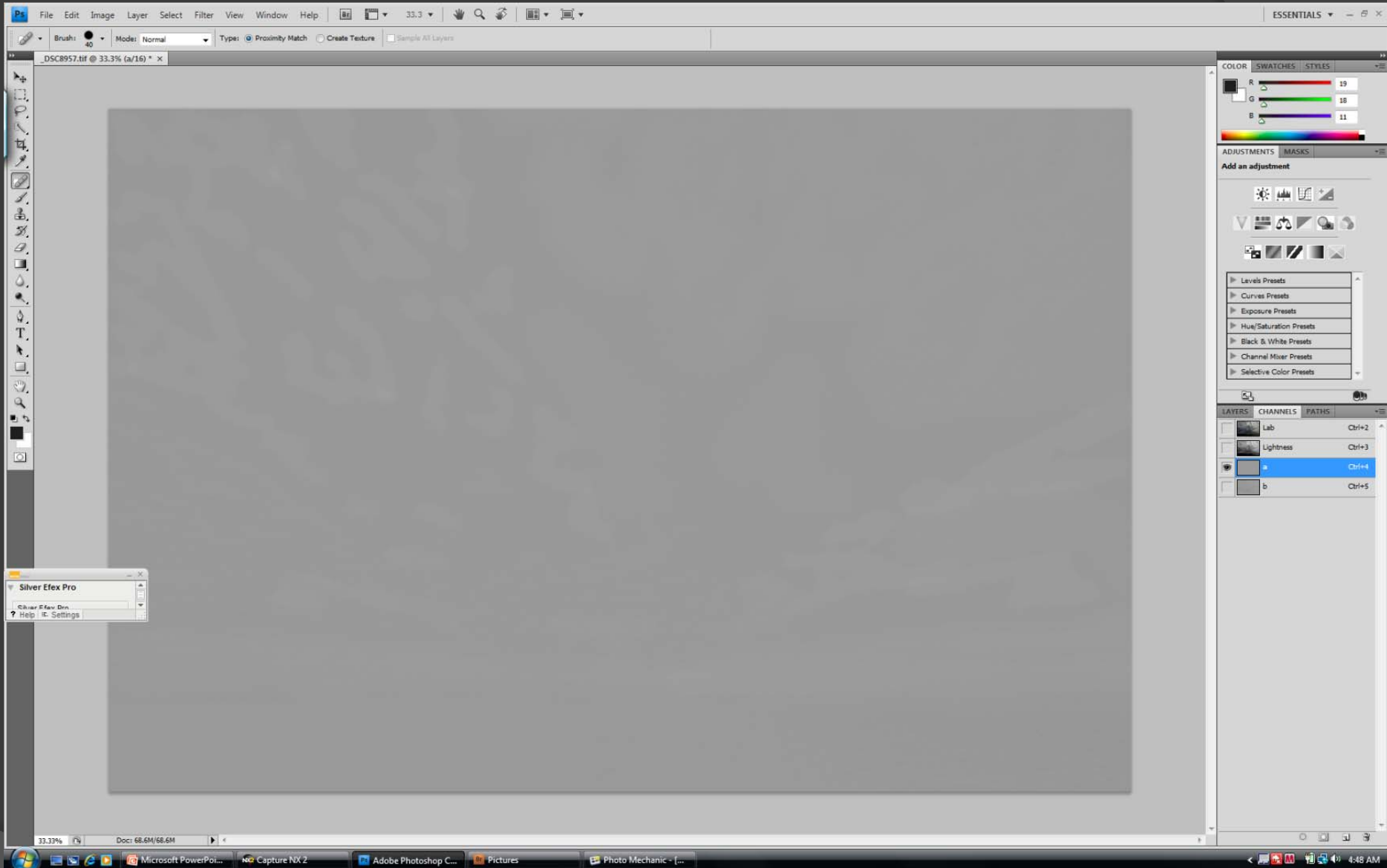
The screenshot displays the Adobe Photoshop CS6 interface. The main canvas shows a landscape image with a dramatic, cloudy sky. The top menu bar includes File, Edit, Image, Layer, Select, Filter, View, Window, and Help. The top toolbar shows various tools, and the bottom toolbar shows the status bar with '33.33%' zoom and 'Doc: 68.6M/68.6M'.

The right-hand side of the interface features several panels:

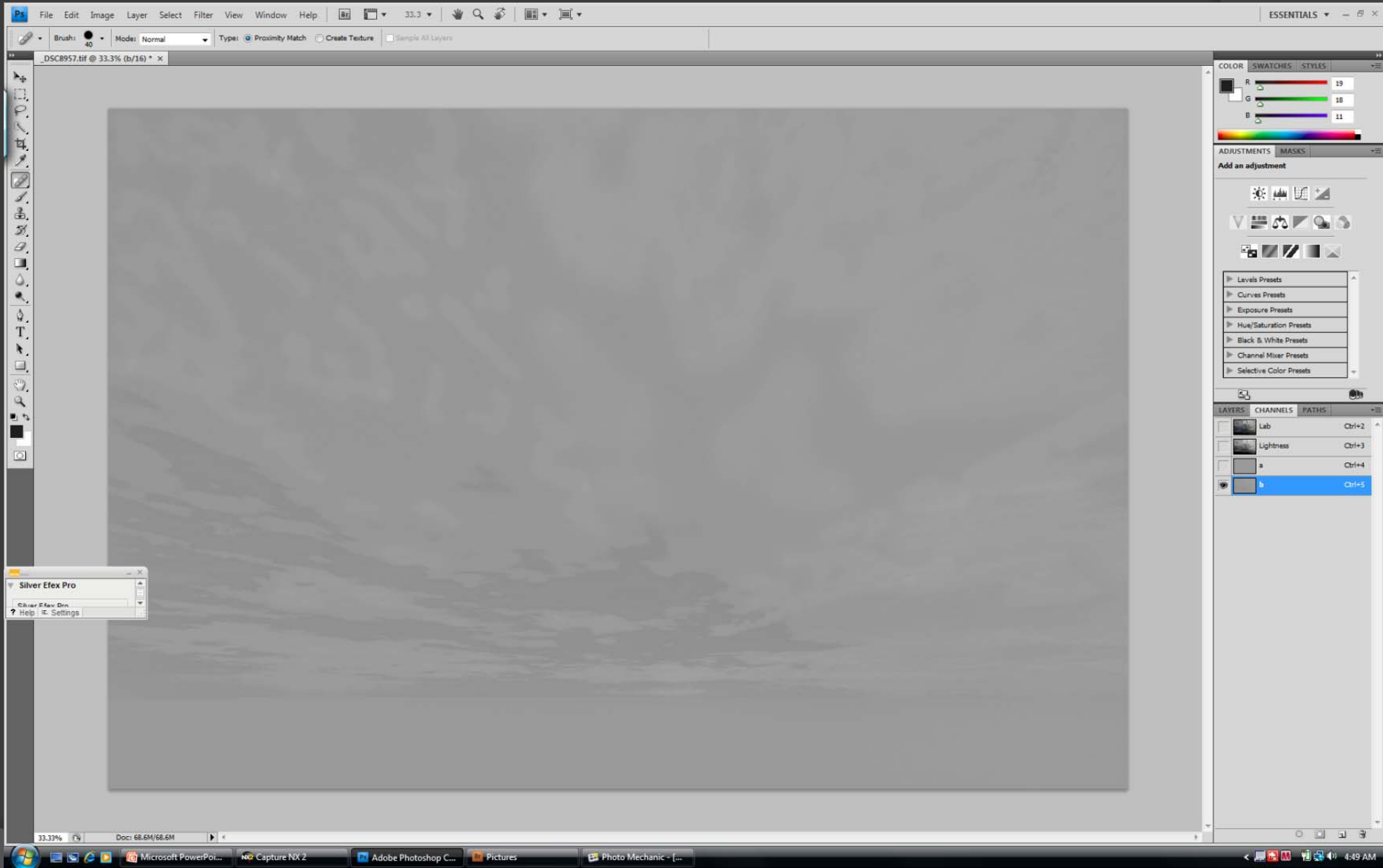
- COLOR SWATCHES STYLES:** Shows the RGB color model with values: R: 19, G: 18, B: 11.
- ADJUSTMENTS MASKS:** Includes icons for Levels, Curves, Exposure, Hue/Saturation, Black & White, Channel Mixer, and Selective Color.
- CHANNELS:** The 'CHANNELS' tab is active, showing a list of channels: Lab (Ctrl+2), Lightness (Ctrl+3), a (Ctrl+4), and b (Ctrl+5). The 'Lab' and 'Lightness' channels are highlighted in blue, indicating they are selected.

The bottom taskbar shows several open applications: Microsoft PowerPoint, Capture NX 2, Adobe Photoshop CS6, Pictures, and Photo Mechanic. The system clock in the bottom right corner shows 4:46 AM.

LS: A Channel



LS: B Channel



LS: Lightness Channel

The screenshot displays the Adobe Photoshop interface with a cloud image open. The 'CHANNELS' panel on the right is active, showing the 'Lightness' channel selected. The 'ADJUSTMENTS' panel is also visible, showing various adjustment options. The 'LAYERS' panel shows the 'Lab' color space with 'Lightness', 'a', and 'b' channels. The 'COLOR' panel shows the RGB color model with sliders for Red (19), Green (18), and Blue (11). The 'ADJUSTMENTS' panel shows various adjustment options including Levels, Curves, Exposure, Hue/Saturation, Black & White, Channel Mixer, and Selective Color. The 'LAYERS' panel shows the 'Lab' color space with 'Lightness', 'a', and 'b' channels. The 'COLOR' panel shows the RGB color model with sliders for Red (19), Green (18), and Blue (11). The 'ADJUSTMENTS' panel shows various adjustment options including Levels, Curves, Exposure, Hue/Saturation, Black & White, Channel Mixer, and Selective Color.

File Edit Image Layer Select Filter View Window Help 33.3

Brush: 40 Mode: Normal Type: Proximity Match Create Texture Sample All Layers

DSC8957.tif @ 33.3% (Lightness/16) * x

Silver Efex Pro
Silver Efex Dn.
Help Settings

33.33% Doc: 68.6M/68.6M

Microsoft PowerPoi... Capture NX 2 Adobe Photoshop C... Pictures Photo Mechanic - [...]

4:49 AM

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 unaggressive 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

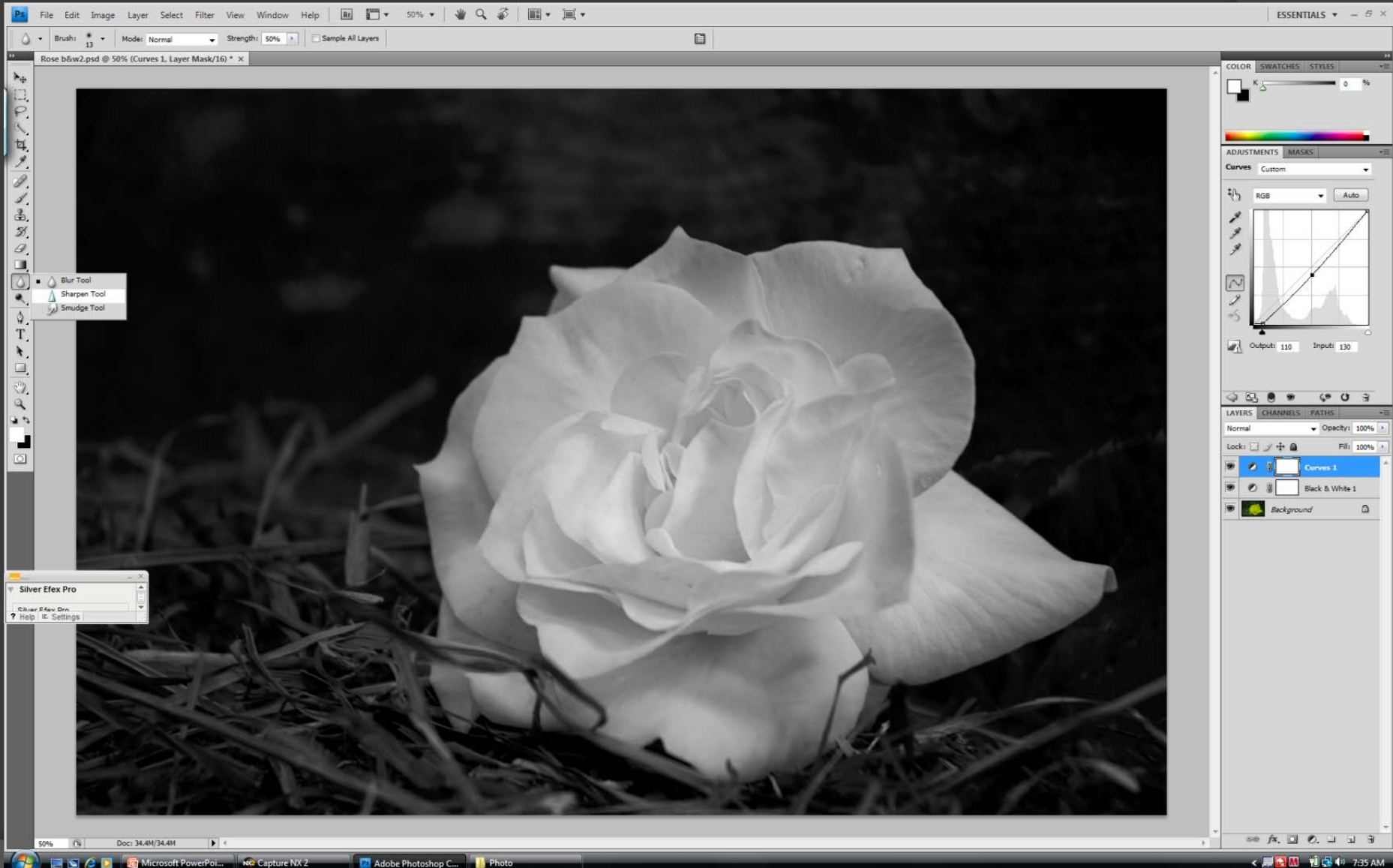
- ◎ Methods
 - Sharpening tool
 - Erasing Technique
 - Masking Technique

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

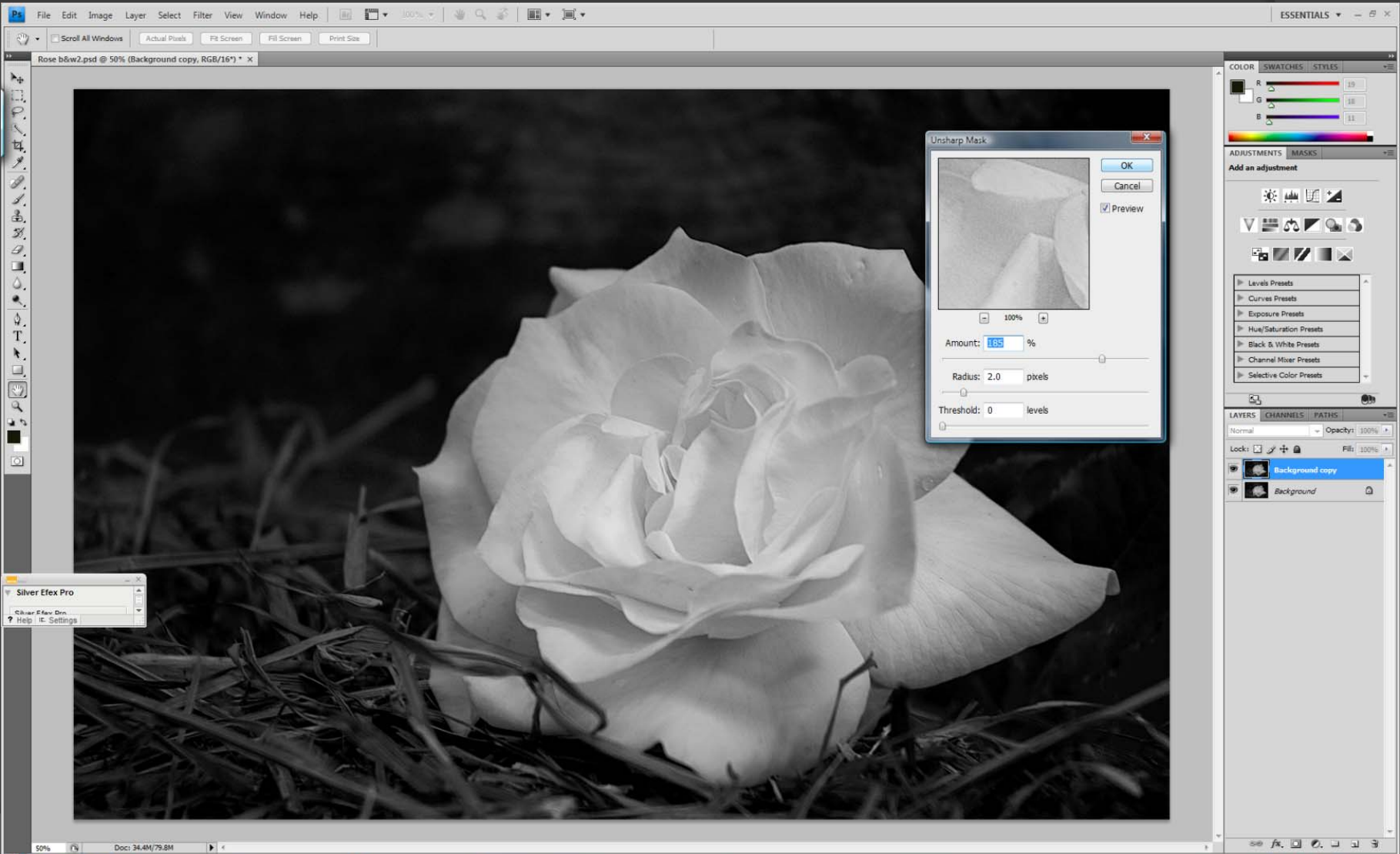
SS: Sharpening Tool



SS: Sharpening Tool



SS: Erase Technique Duplicate & Sharpen

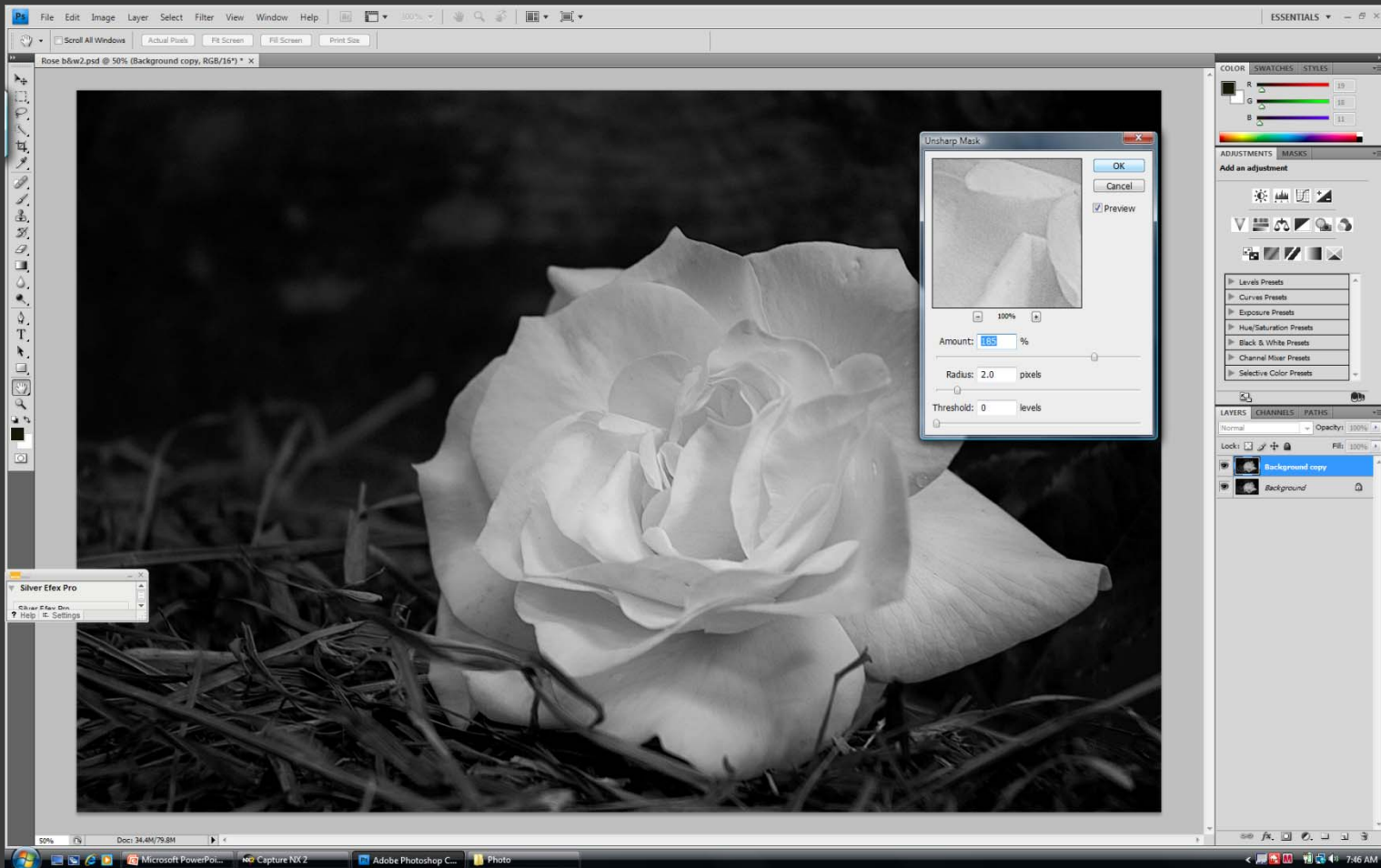


SS: Erase Technique

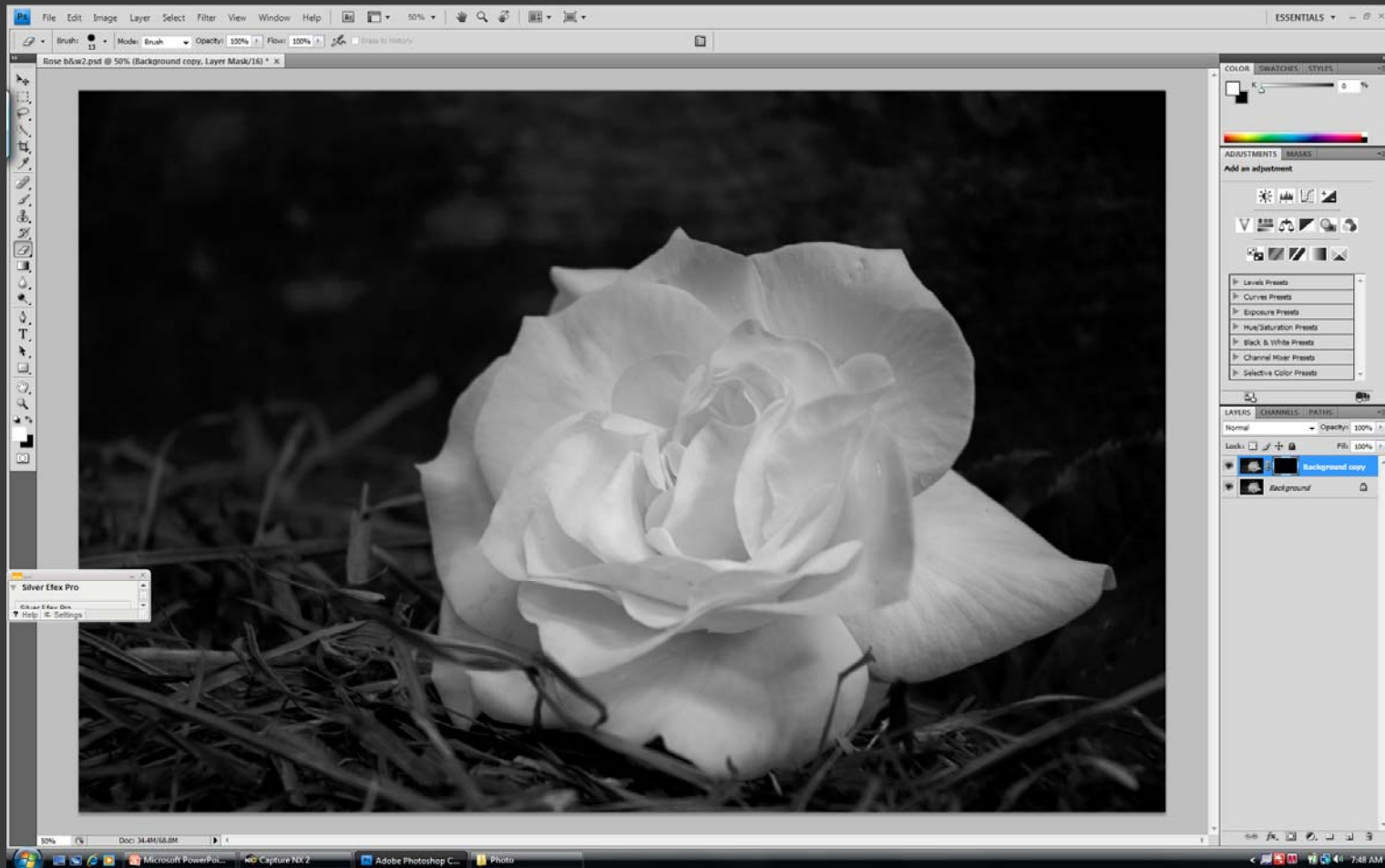
Erase areas to unsharpen



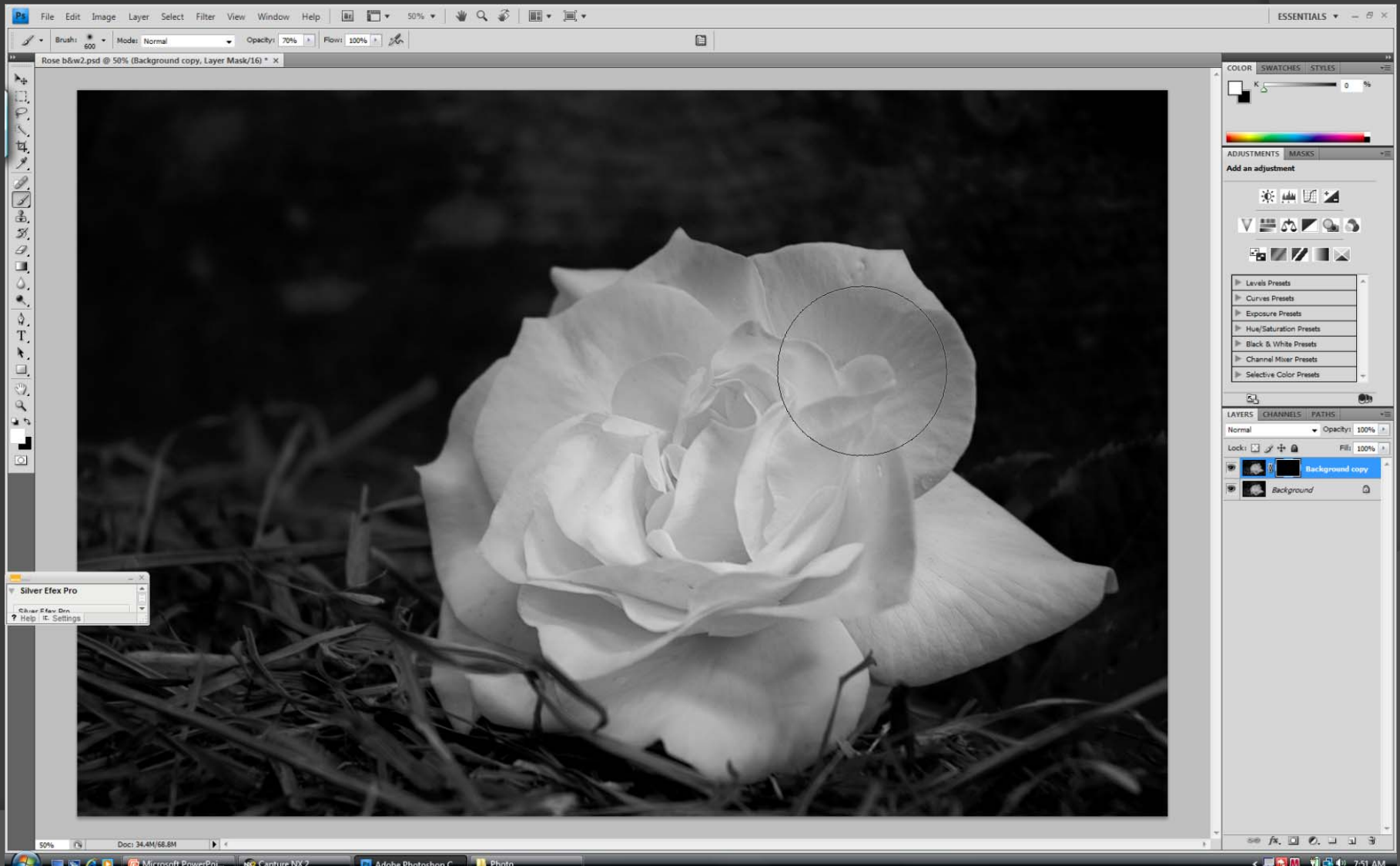
SS: Mask Technique Duplicate & Sharpen



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.

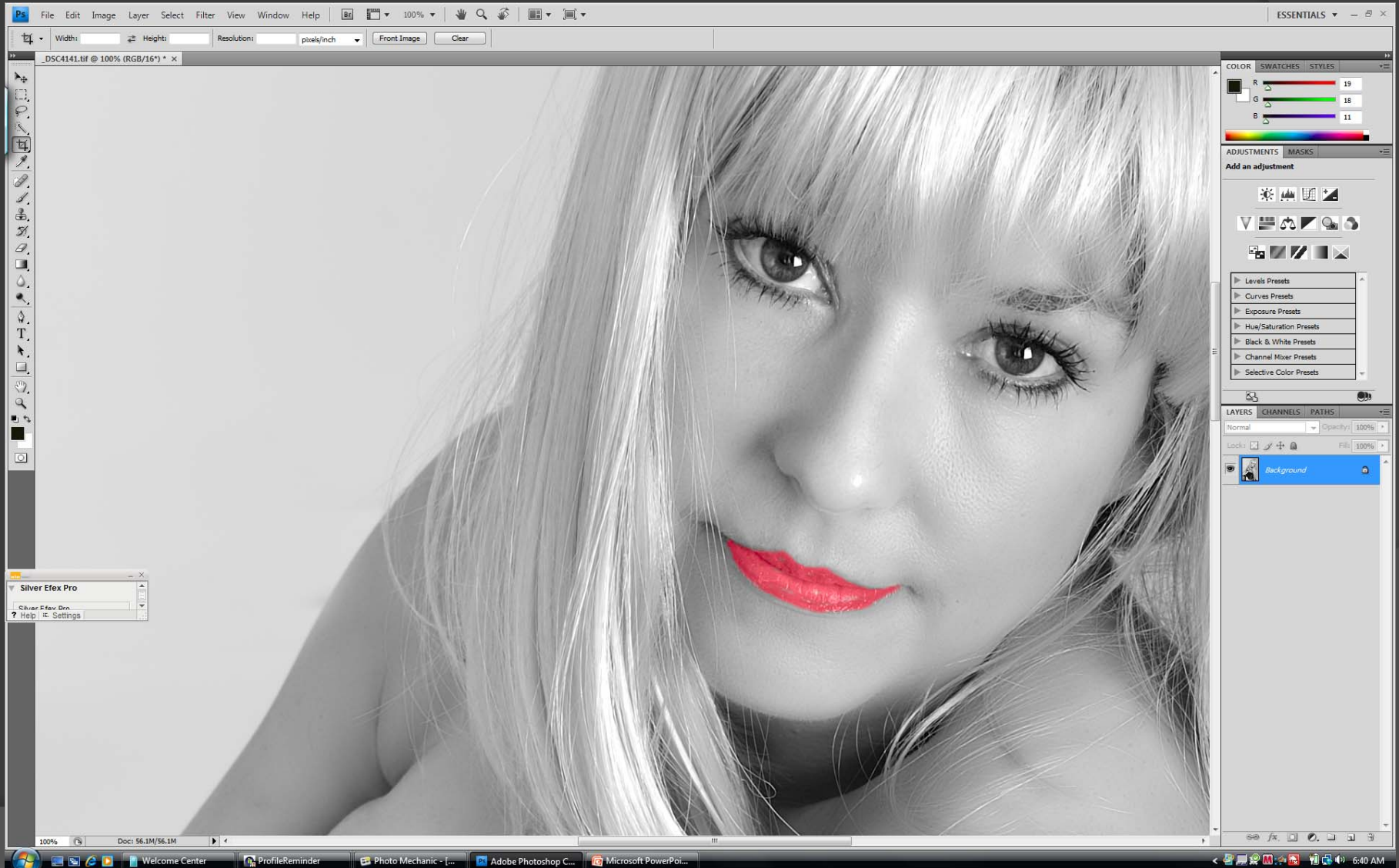
SS: Portraits

- ⦿ 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).

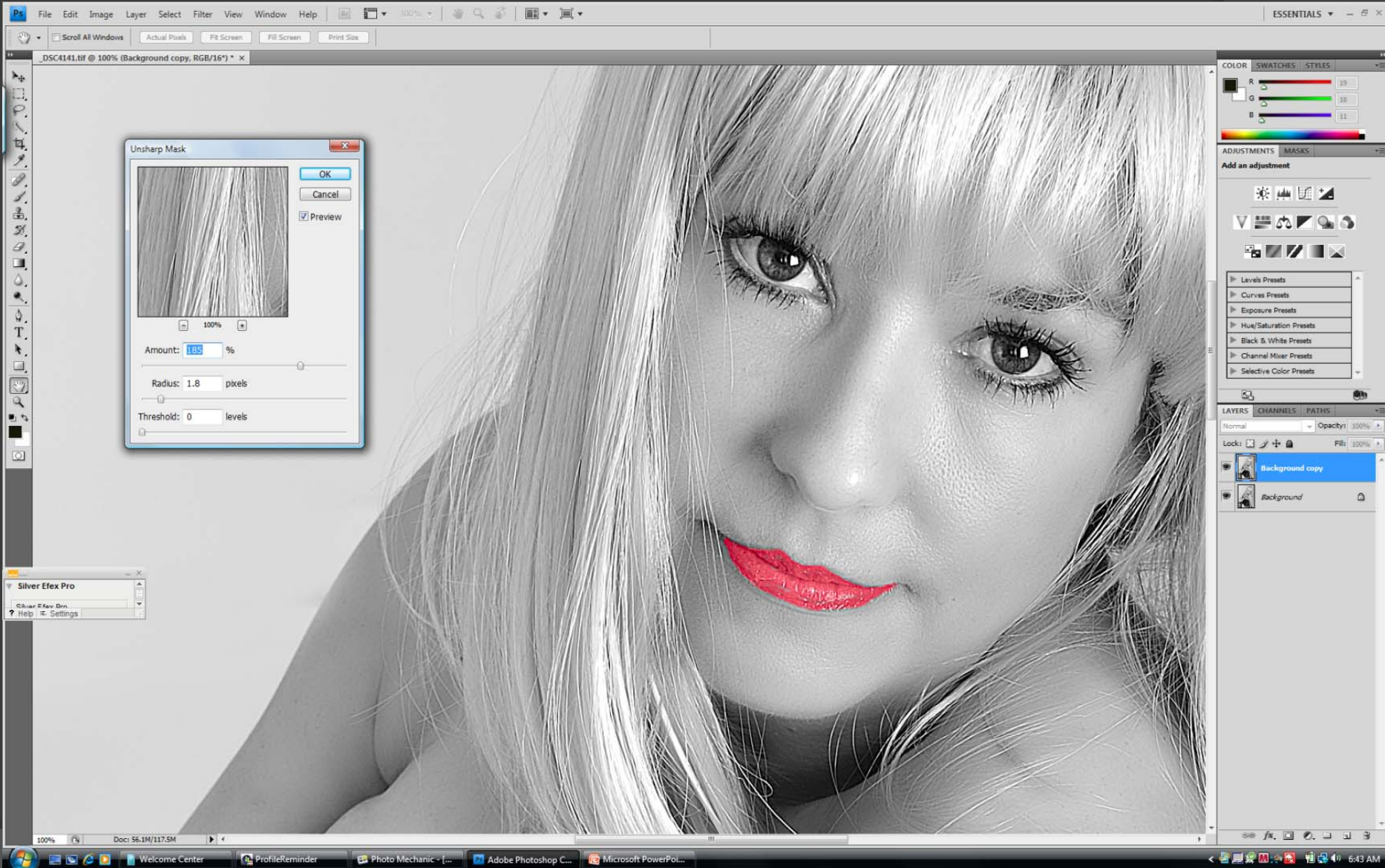
SS: Portraits

- ⦿ 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

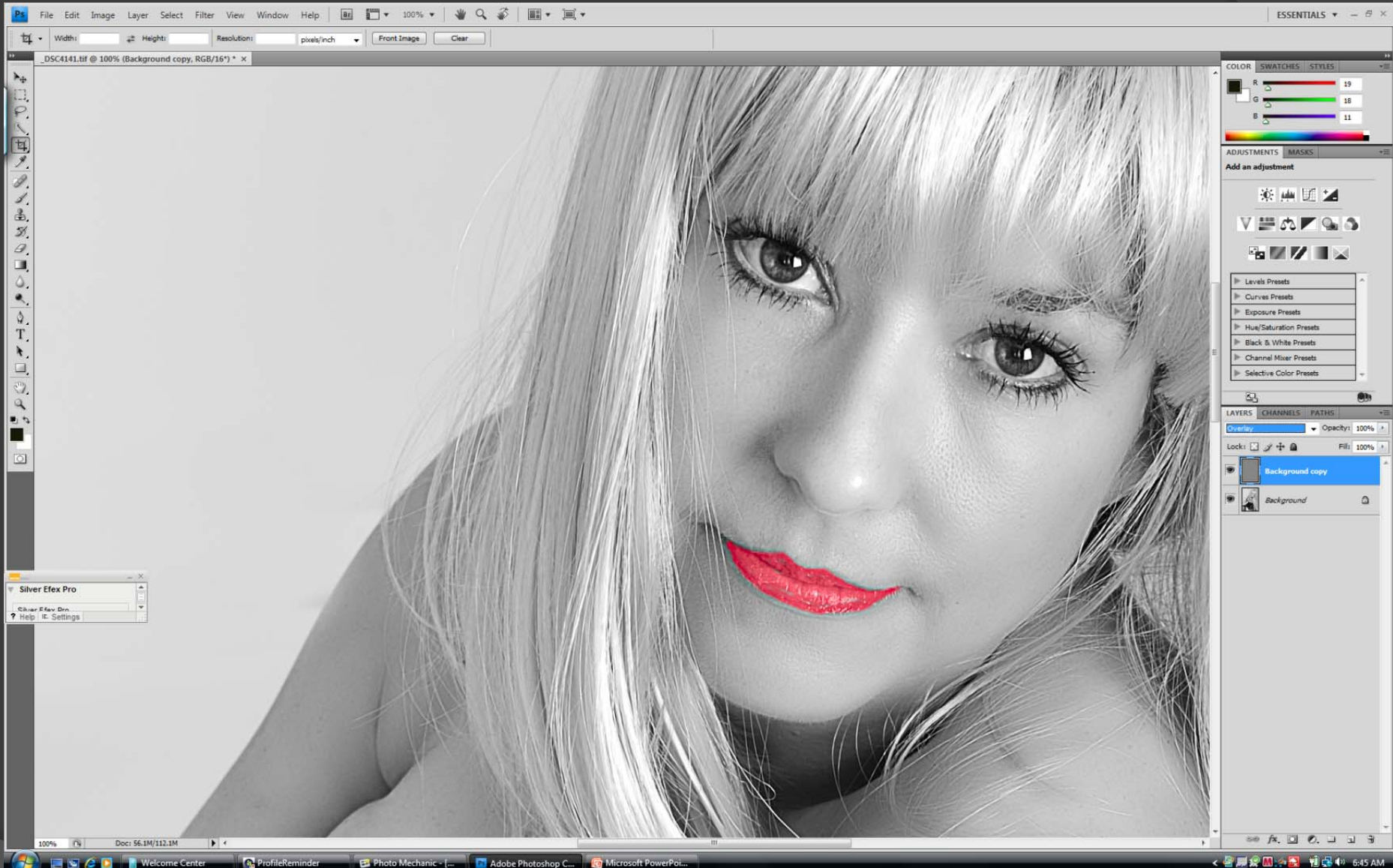
Portraits: B&W, Curves, Skin Softening



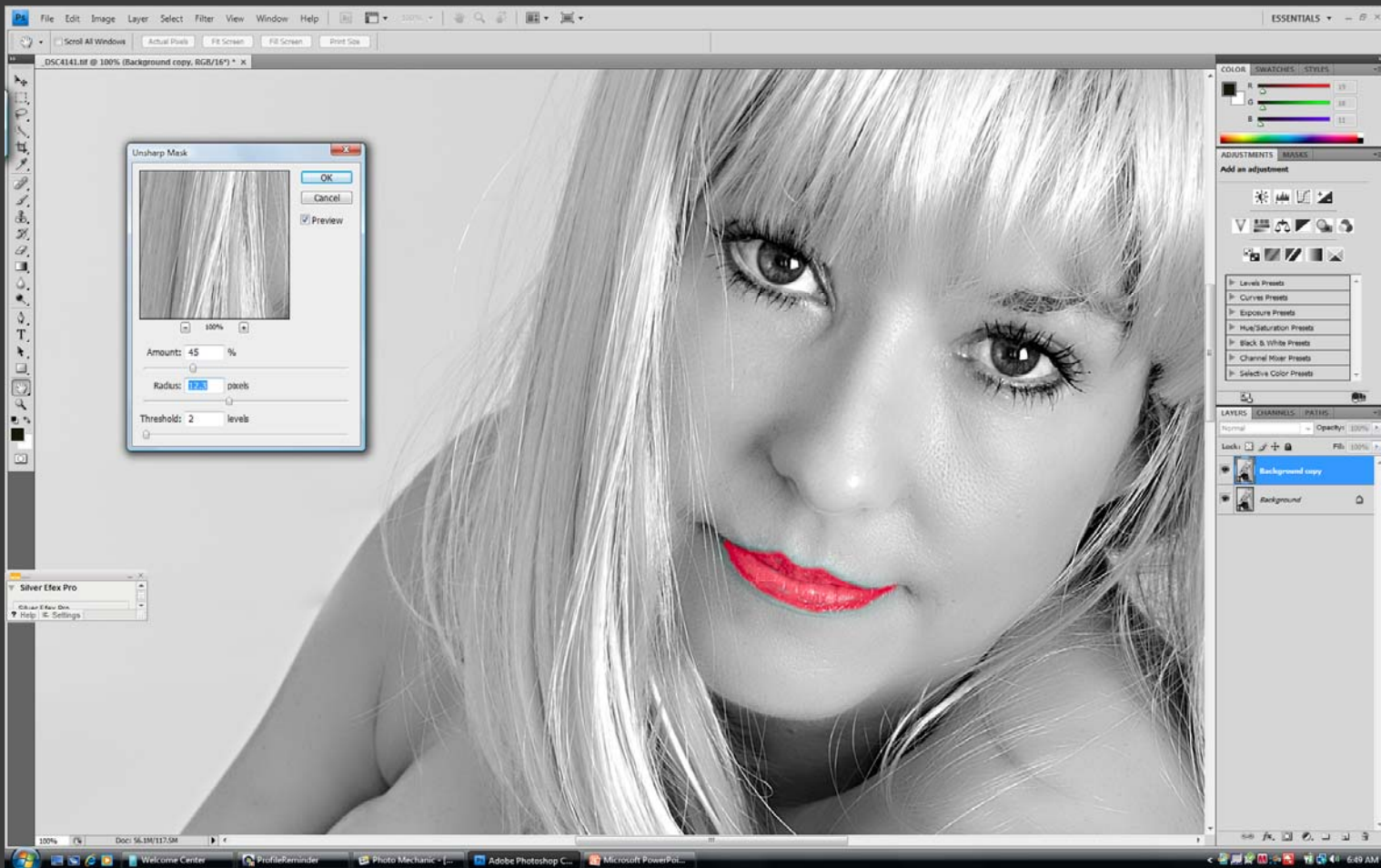
Portraits: Global USM



Portraits: Global HP



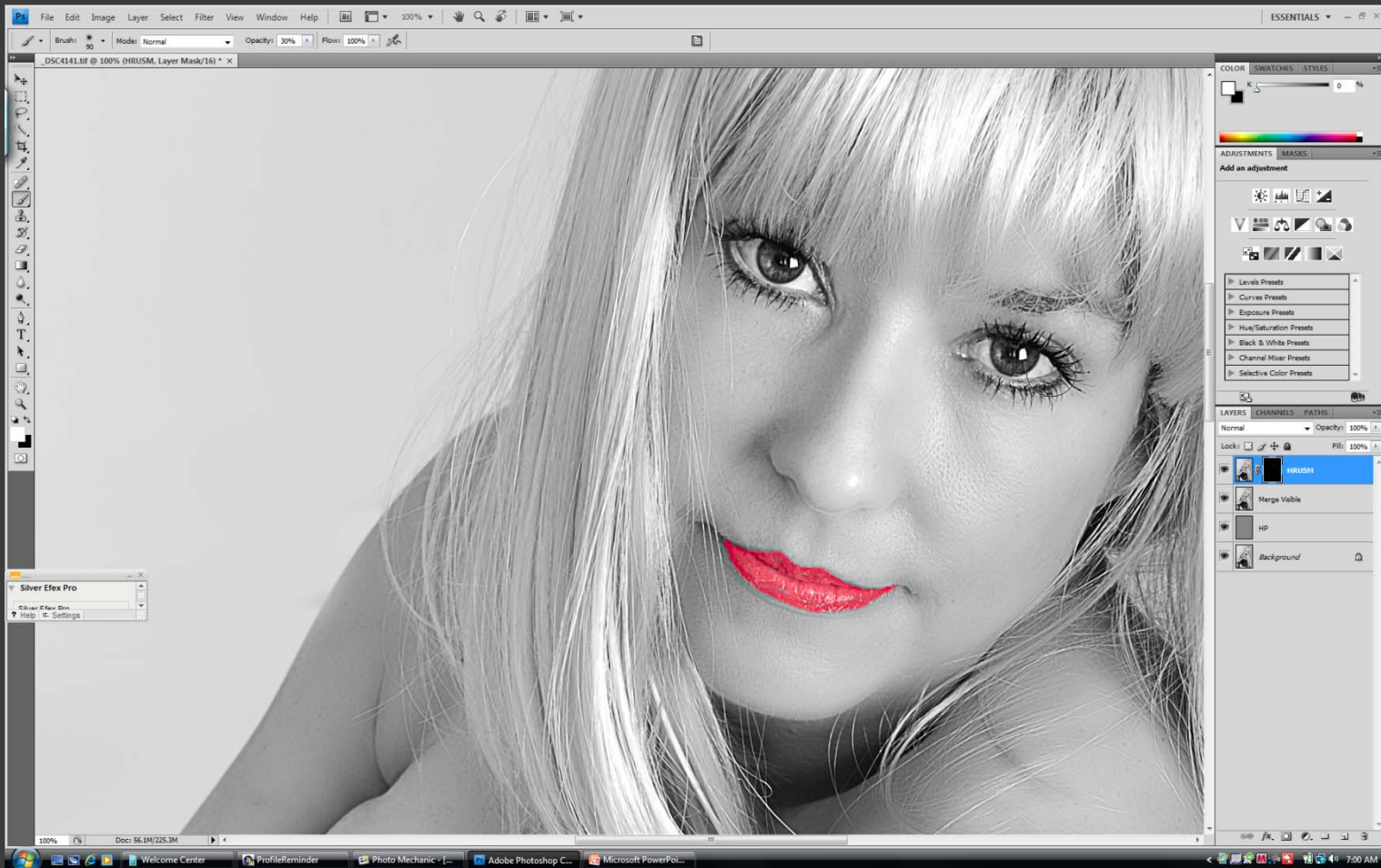
Portraits: HRUSM



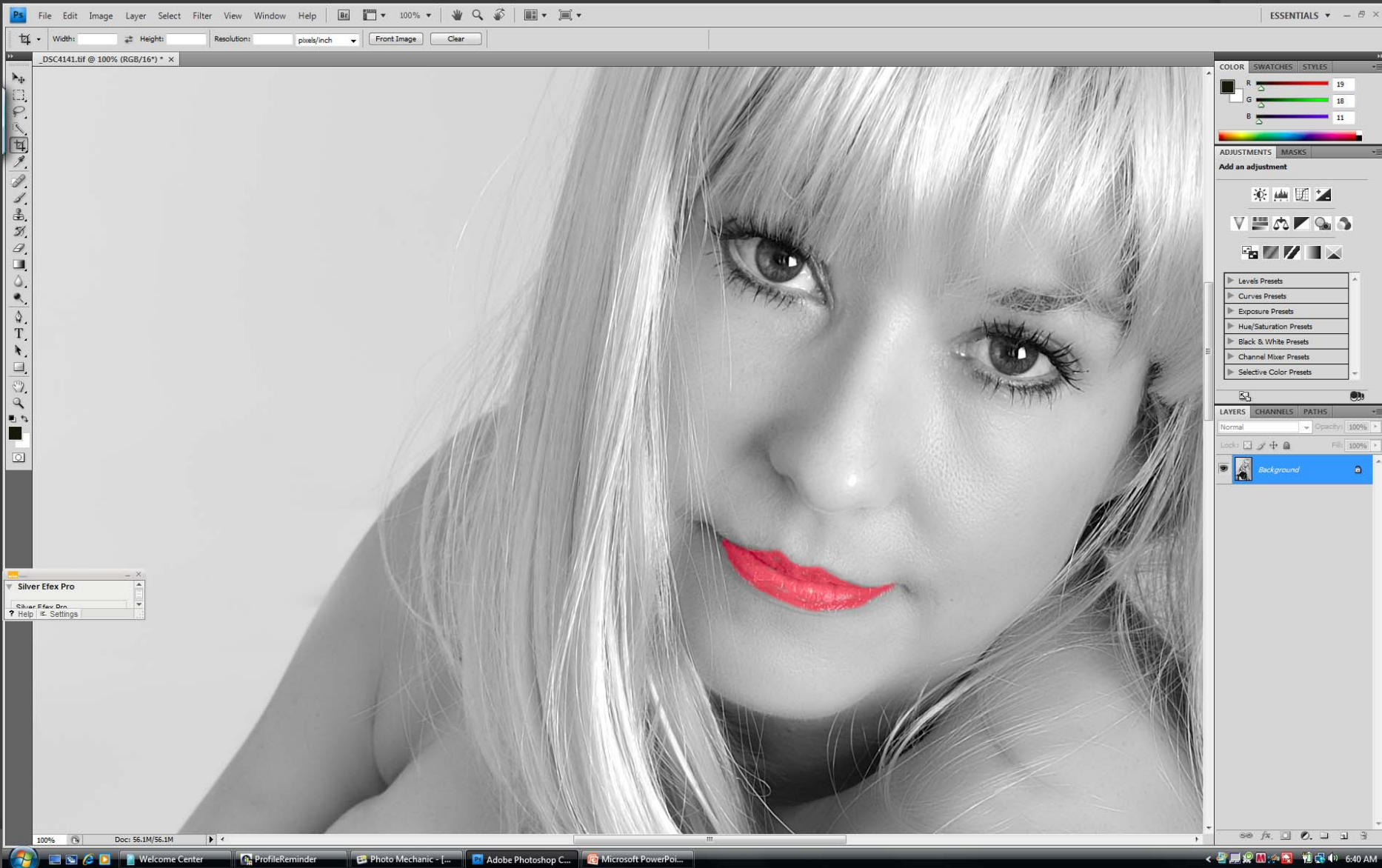
Portraits: The Problem

- ⦿ 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.

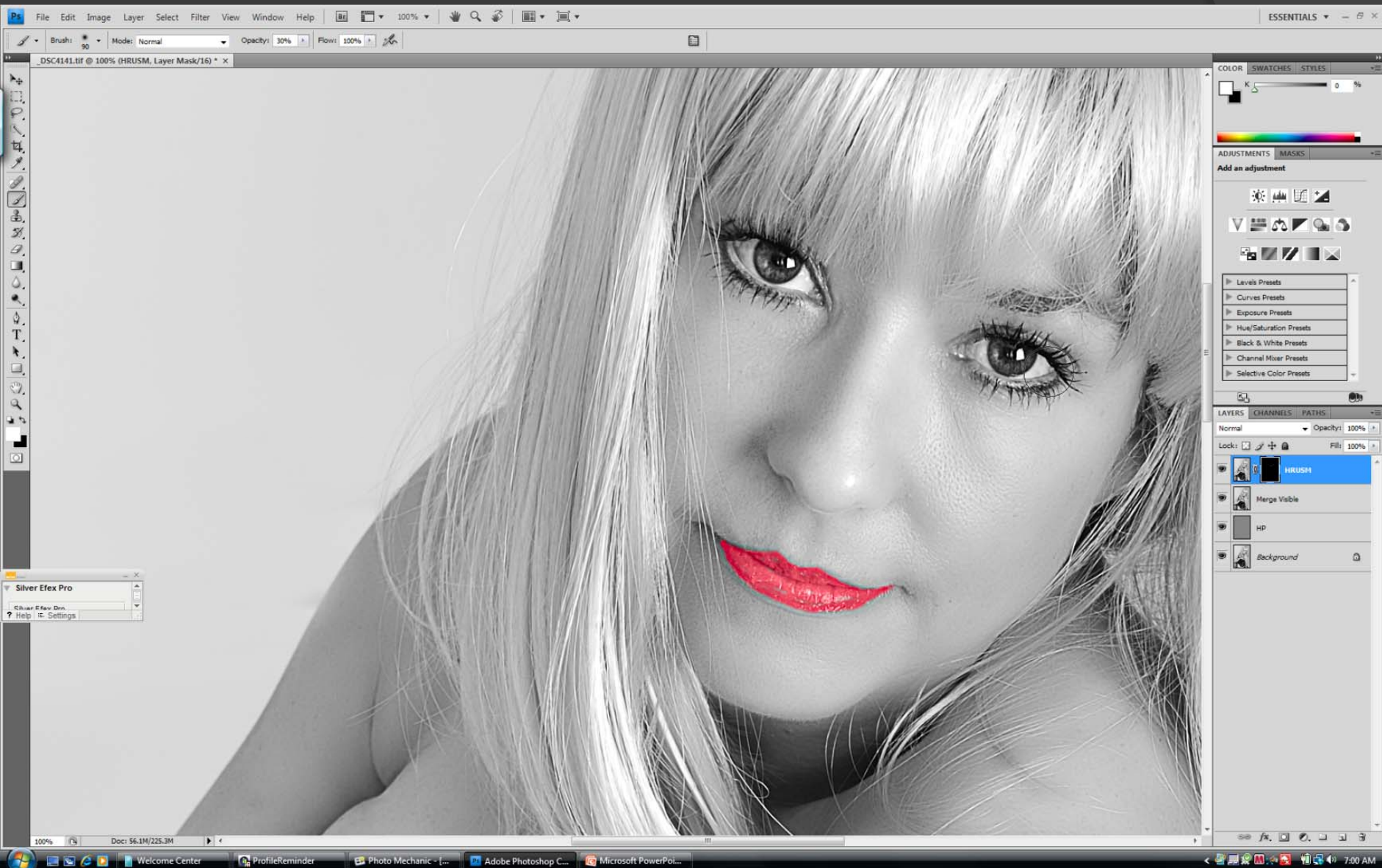
Portraits: The Solution



Before



After



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.

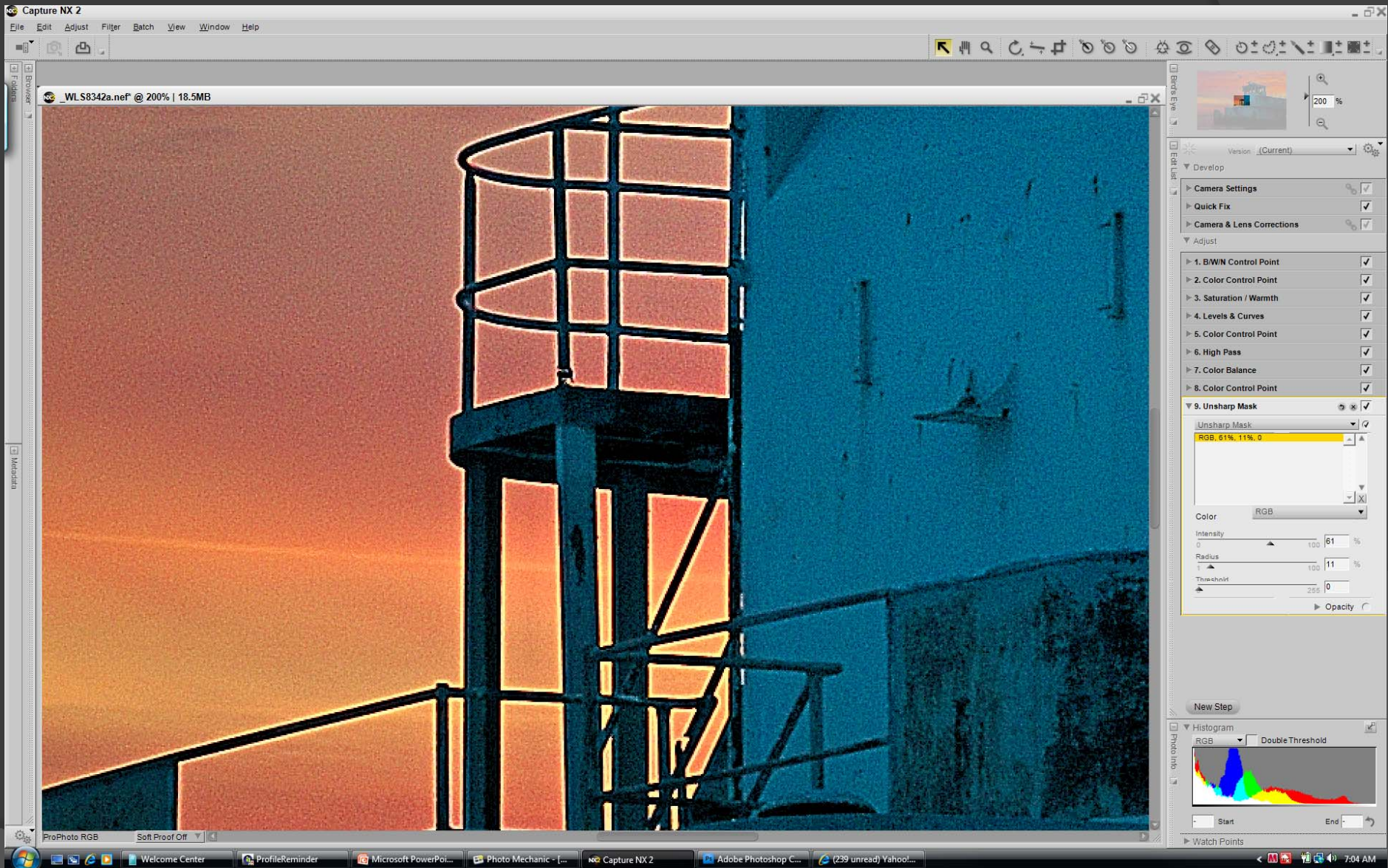
Side Effects: Halos



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?