

Selecting specific parts of an image to make adjustments using Adobe Photoshop

# ADVANCED IMAGE MASKING TECHNIQUES

# Selective Image Editing

- ⦿ Among the most powerful features in Adobe Photoshop are its **Selection** and **Masking** capabilities
- ⦿ These capabilities allow **user-defined** areas of an image to be adjusted without affecting other areas
- ⦿ Similar to darkroom dodging/burning, but with far more precision and subtlety, plus re-adjustment and/or undo

# Selections and Masks

- ⦿ A **selection** defines which part(s) of an image will be affected by subsequent operations
- ⦿ A **mask** is a retained selection that is associated with a specific layer
- ⦿ **Adjustment Layers** combine an editable adjustment with a mask that determines where the adjustment takes effect

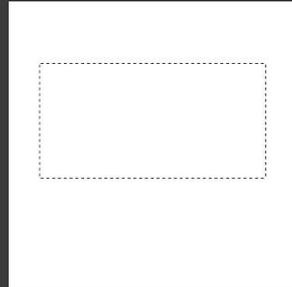
# Area-specific Selection Tools

- ⦿ **Geometric** Selection Tools
  - Rectangular/square selection tool
  - Elliptical/circular selection tool
  - Single row/column selection tools
- ⦿ **Freehand** Selection Tools
  - Lasso tool
  - Polygonal lasso tool
  - Magnetic lasso tool

# Data-specific Selection Tools

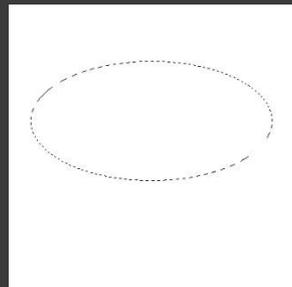
- ⦿ **Automatic** Selection Tools
  - Quick Selection tool
  - Magic Wand selection tool
- ⦿ **Load Channel** as Selection
  - Image data used to make a selection
  - Selection is 8-bit grayscale version of image data from designated color channel(s)
- ⦿ Select **Color Range**

# Geometric Selection Tools



## Rectangular selection tool

Click & drag to make rectangle  
Hold down Shift key for Square  
Options for fixed ratio or size



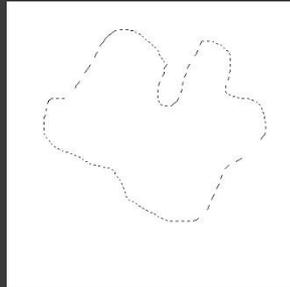
## Elliptical selection tool

Click & drag to make ellipse  
Hold down Shift key for Circle  
Options for fixed ratio or size

## Row/column selection tools

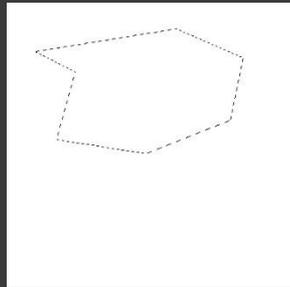
Click to select single row/column

# Freehand Selection Tools



## Lasso selection tool

Click & drag to make any shape  
Automatically closes when  
mouse button is released



## Polygonal Lasso selection tool

Click to start, click each vertex  
Vertices connected by straight lines  
Click on start point to close



## Magnetic Lasso selection tool

Click to start  
Guide along an edge to track it  
Click to force a point/corner  
Click on start point to close

# Automatic Selection Tools



## Quick Selection tool

Set “brush” size

Click & drag to automatically select similar image area



## Magic Wand selection tool

Set tolerance

Set whether contiguous

Click to automatically select similar image area(s)

# Grayscale Selections

- Preceding Geometric, Freehand, and Automatic selection tools generate white/black “all or nothing” selections
- Selections can also use **256 shades of gray** to specify the percentage to which each pixel is included in the selection
- “Crawling ants” indicate 50% point

# Load Channel as Selection



## Load Channel as Selection

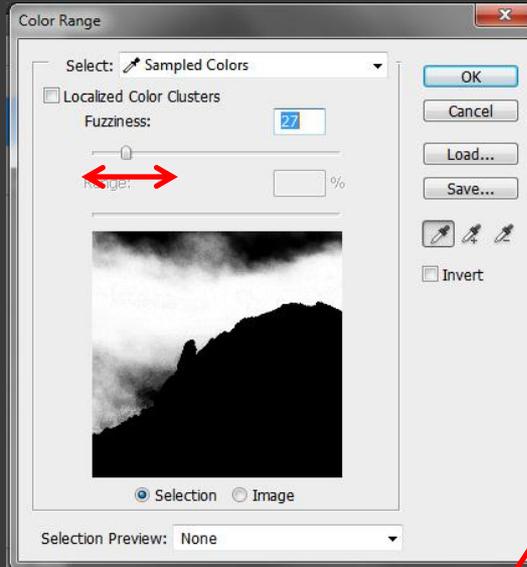
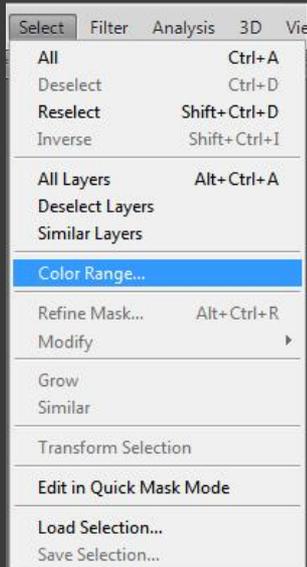
*The most powerful button in Photoshop!*

Clicking this button loads the selected channel(s) as an 8-bit grayscale selection



After clicking this button, crawling ants enclose the area(s) that are more than 50% included in the selection (actual selection is grayscale)

# Select Color Range



## Select Color Range

Click to choose initial color  
Adjust fuzziness to include similar colors

Click here initially to pick light blue color



After adjusting fuzziness and clicking OK, crawling ants enclose the area(s) that are more than 50% included in the selection  
(actual selection is grayscale)

# Arbitrary Manual Selections

- In addition to the preceding selection tools, Photoshop allows arbitrary selection of specific image areas by painting directly over the image in **Quick Mask** mode
- All “painting” tools can be used
  - Paint brush (size, hardness, opacity)
  - Paint bucket (tolerance, contiguous)
  - Gradient tool (opacity)
  - Shape-drawing tools (rectangle, etc.)

# Quick Mask Mode



## Quick Mask Mode

Click button to Enter or Exit Quick Mask Mode

When entering Quick Mask Mode with no prior selection, entire image is initially selected (white)

Paint black over the image to deselect arbitrary areas

Paint white over the image to select arbitrary areas

White areas of Quick Mask show as transparent

Black areas of Quick Mask show as tinted

Exit Quick Mask Mode to finish selection



In Quick Mask Mode



After Exiting Quick Mask Mode

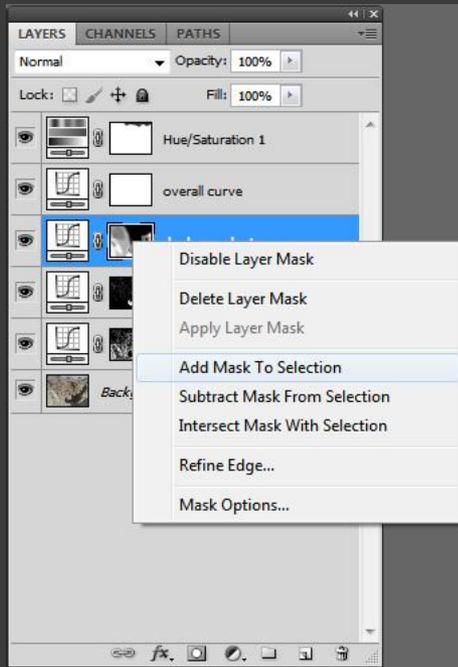
crawling ants  
enclose the area(s)  
that are more than  
50% included in the  
selection  
(actual selection is  
grayscale)

# Modifying a Selection

- Shift-click when using a selection tool to **add to** an existing selection
- Alt-click\* when using a selection tool to **subtract from** an existing selection
- Use Refine Edge, Modify, Grow items in Select menu to **change selection edges**
- Click & drag inside an existing selection (or use arrow keys) to **move** selection

\*Option-click for Mac

# Modifying a Selection



Photoshop also provides powerful options for **combining existing masks** with the current selection

(Right-click\* on mask icon to display menu)

Add = Area in Selection OR in Mask

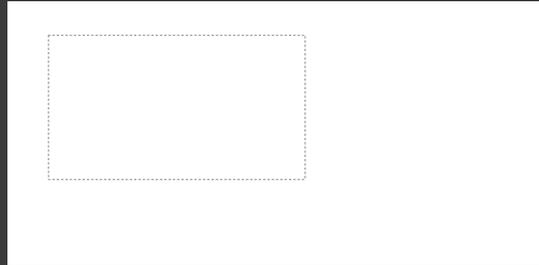
Subtract = Area in Selection NOT in Mask

Intersect = Area in Selection AND in Mask

These operations use grayscale math to preserve 256 levels of partial selection after combination

\*Control-click for Mac

# Selection and Mask Math



current selection



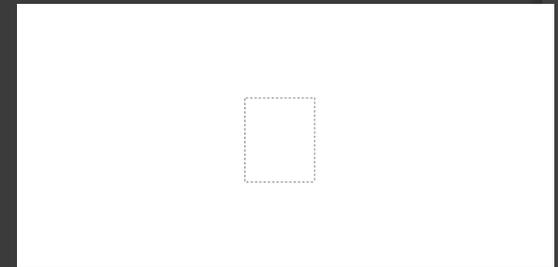
mask



**Add** mask to selection  
(selection OR mask)



**Subtract** mask from selection  
(selection NOT mask)



**Intersect** mask with selection  
(selection AND mask)

All math (logic) is done using an existing mask with the current selection  
All math (logic) operates on grayscale (0 to 255) values

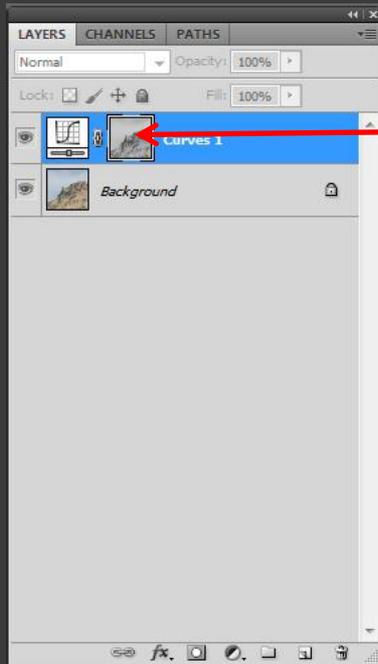
# Turning a Selection into a Mask

- Create a new **Adjustment Layer** to automatically make the current selection into a mask for the new Layer
- The new Adjustment Layer can be used simply for saving a mask (without making an adjustment to the image)
- Additional tools are available for modifying a mask (vs. a selection)

# Adjustment Layer Masking

- **White** areas of a mask **allow** the associated adjustment to affect those areas of the image
- **Black** areas of a mask **prevent** the associated adjustment from affecting those areas of the image
- **Gray** areas of a mask allow the associated adjustment to have a **partial** effect on those areas of the image

# Modifying a Mask



Alt-click\* on the mask icon to make the mask visible instead of the image



The mask is an 8-bit grayscale image that can be modified using many of the same tools that are used for modifying a regular image, including:

**Curves/Levels** modifications

**Paint brush/bucket** modifications

**Filter** modifications (e.g., Blur)

**Selections** to control where modifications are allowed

\*Option-click for Mac

# Example: Sky Mask

Using the **Magic Wand** tool:

Set narrow **Tolerance** e.g., 10

Check **Anti-alias** & **Contiguous**

Click in representative sky area

Shift-click in unselected sky areas to add these to the selection

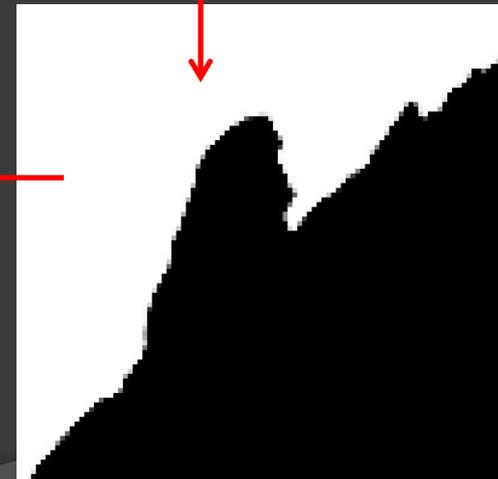
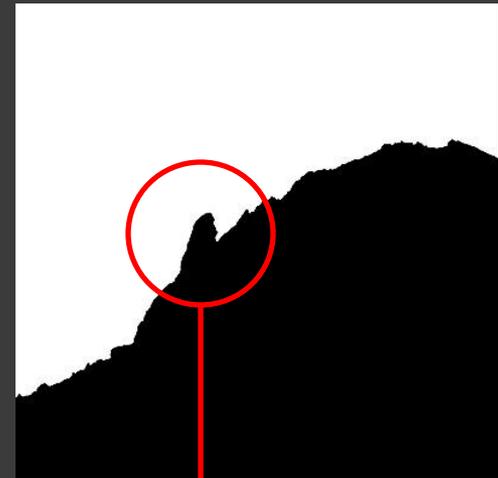
Create a new Curves adjustment layer to save the sky selection as a mask



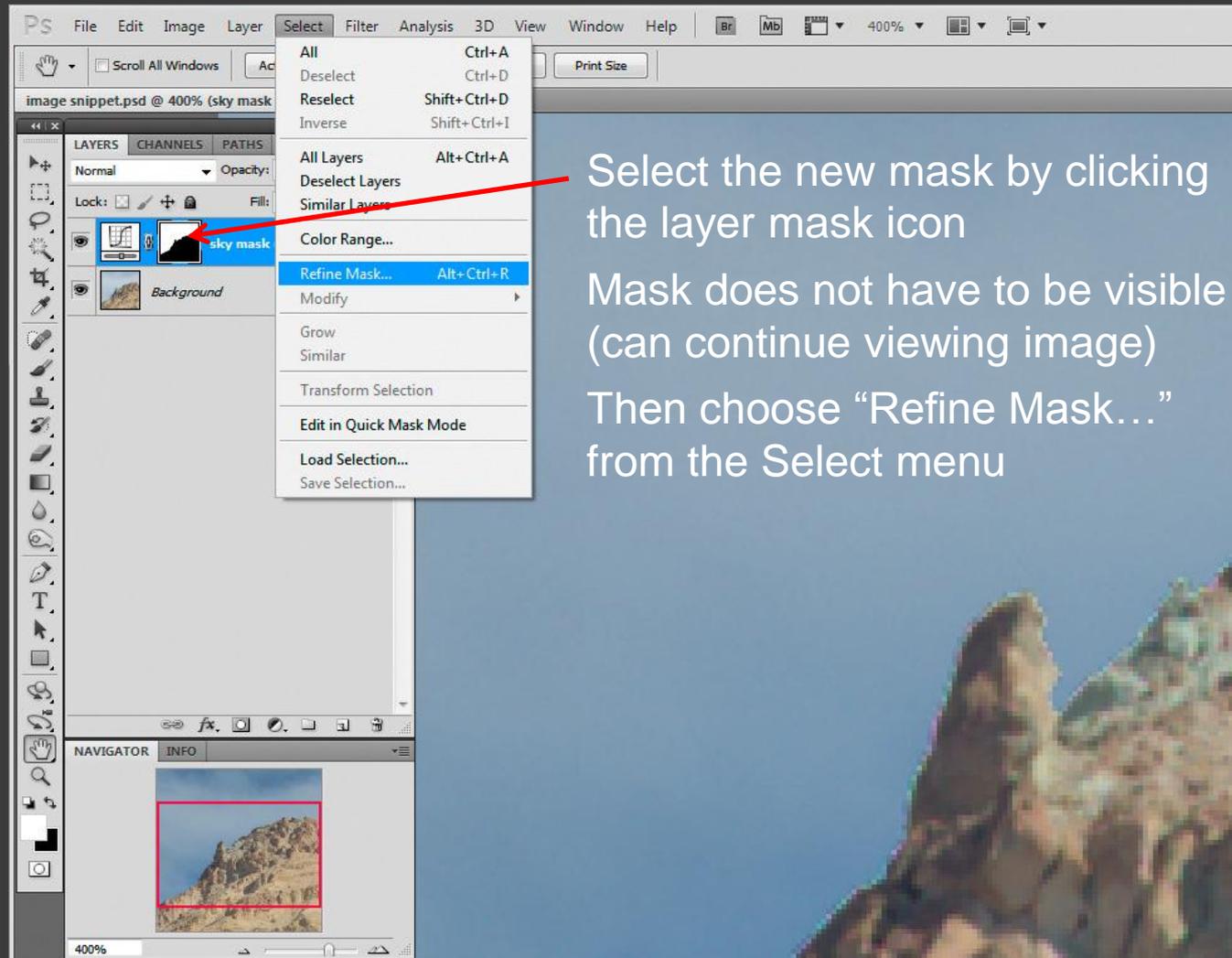
# Example: Sky Mask

Using the **Magic Wand** tool produces a fairly hard-edged mask that may produce an undesirable “border” (below) when an adjustment is made

In this case, the sky area was darkened using a masked Curves adjustment layer



# Refining the Mask Edge



Select the new mask by clicking the layer mask icon

Mask does not have to be visible (can continue viewing image)

Then choose “Refine Mask...” from the Select menu

# Refining the Mask Edge

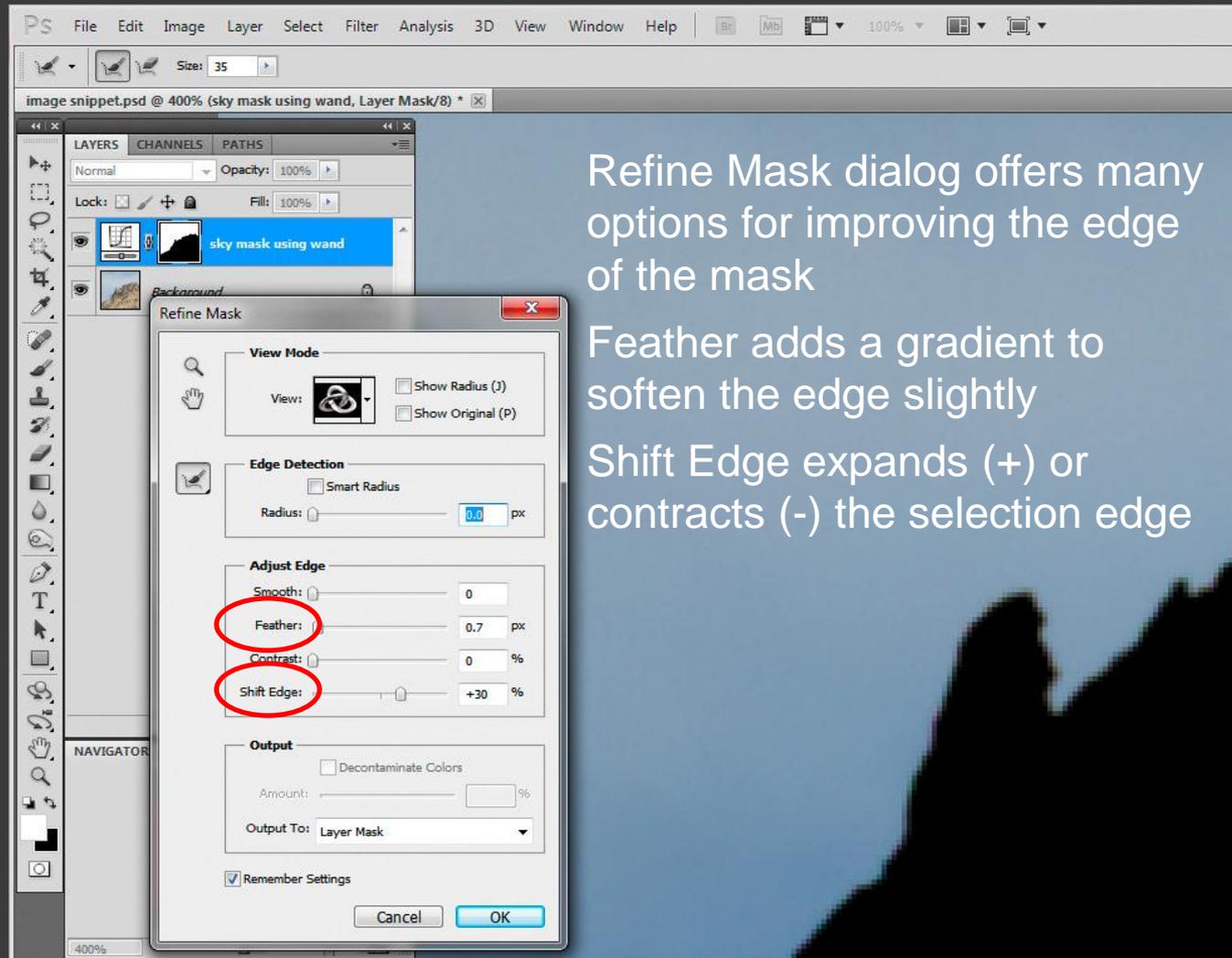


image snippet.psd @ 400% (sky mask using wand, Layer Mask/8) \*

Refine Mask

**View Mode**

View:   Show Radius (R)  Show Original (P)

**Edge Detection**

Smart Radius

Radius:  px

**Adjust Edge**

Smooth:

**Feather:**  px

Contrast:  %

**Shift Edge:**  %

**Output**

Decontaminate Colors

Amount:  %

Output To: Layer Mask

Remember Settings

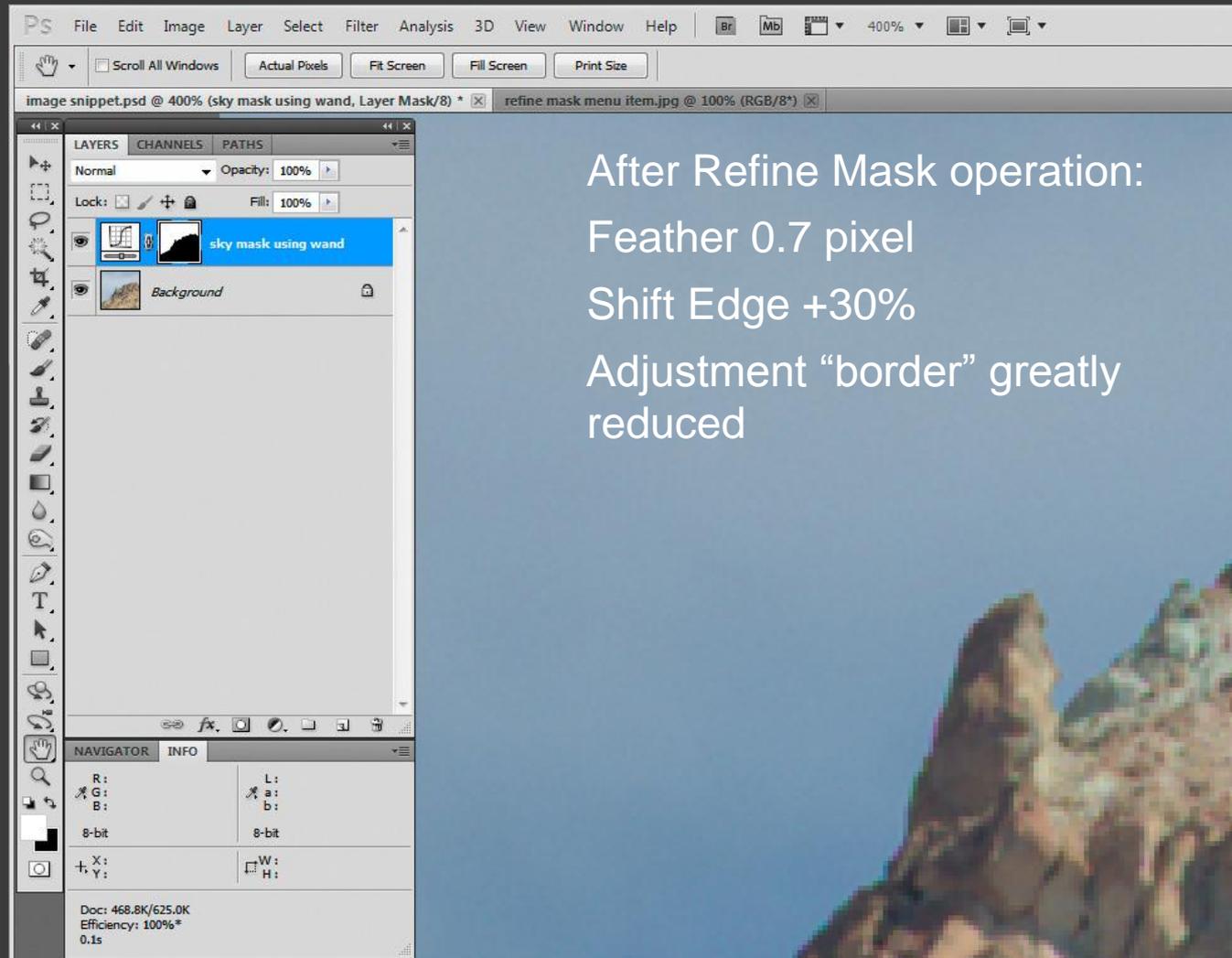
Cancel OK

Refine Mask dialog offers many options for improving the edge of the mask

Feather adds a gradient to soften the edge slightly

Shift Edge expands (+) or contracts (-) the selection edge

# Refining the Mask Edge

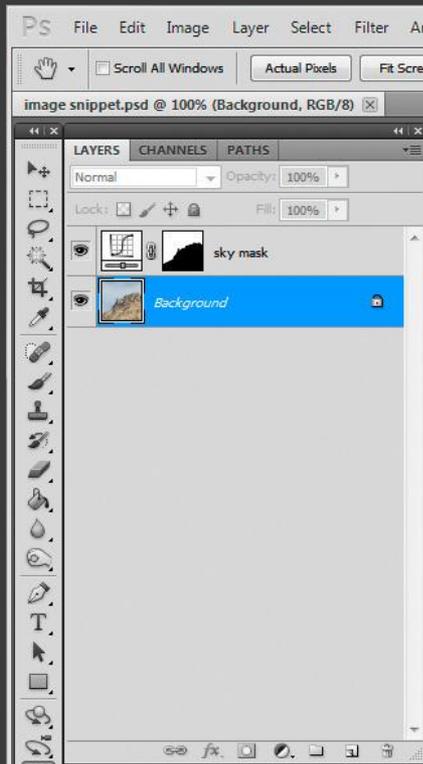


After Refine Mask operation:  
Feather 0.7 pixel  
Shift Edge +30%  
Adjustment “border” greatly reduced

# Example: Highlights Mask

Make certain that Background (image) layer is highlighted

Switch to CHANNELS, click “Load channel as selection” button

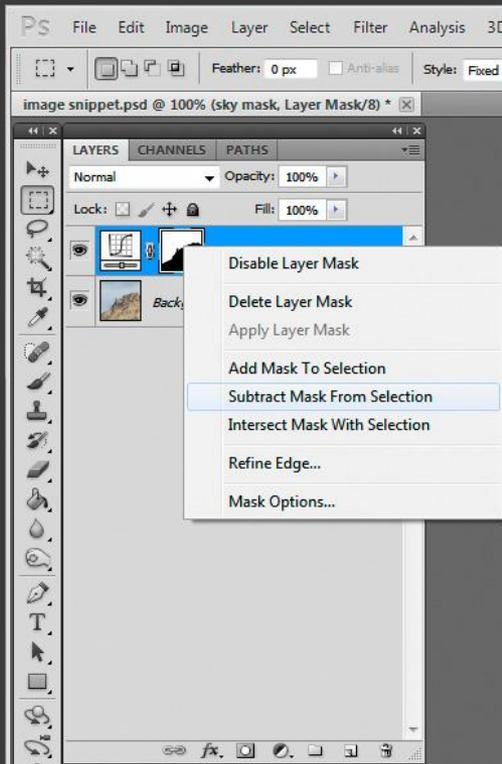


Crawling ants indicate areas that are more than 50% selected

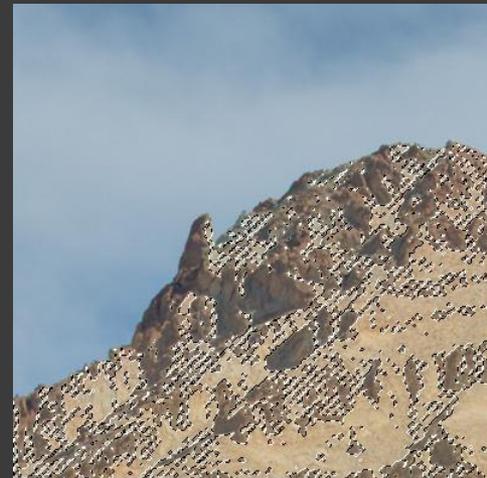


# Example: Highlights Mask

Switch back to LAYERS,  
right-click\* on sky mask,  
choose Subtract Mask  
from Selection



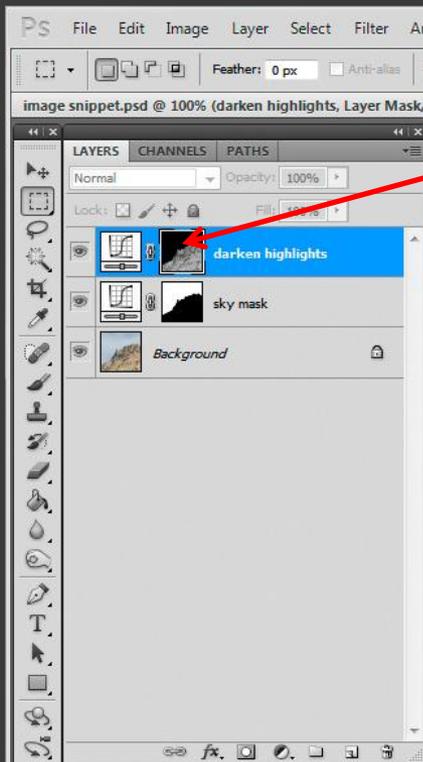
Sky area is removed  
from selection, so only  
earth highlights are  
selected



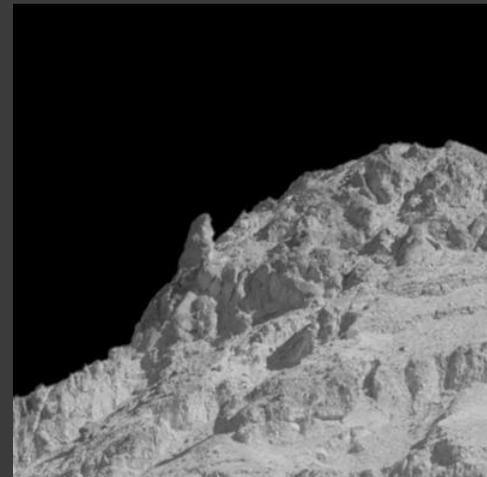
\*Control-click for Mac

# Example: Highlights Mask

Create new Curves adjustment layer; modified selection becomes mask



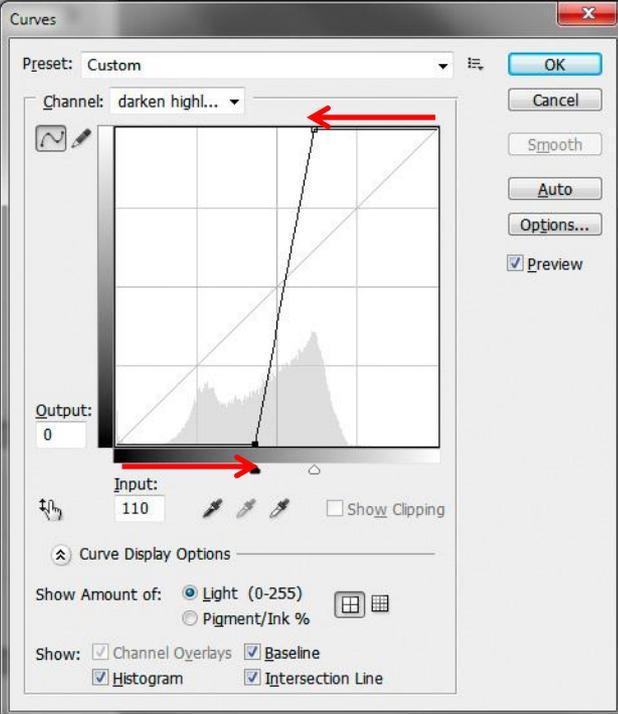
Alt-click\* on mask icon to make the mask visible



\*Option-click for Mac

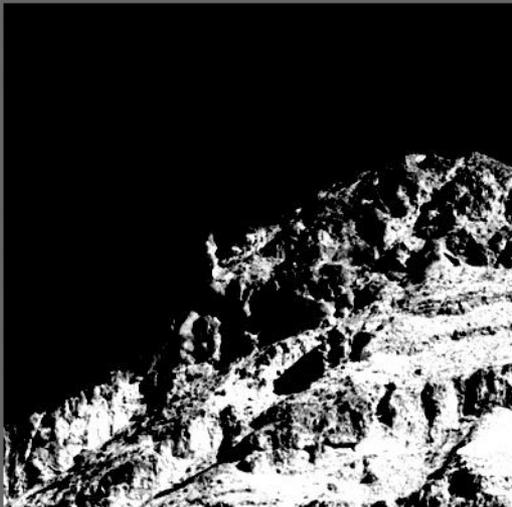
# Example: Highlights Mask

With mask visible, use Control-M\* to invoke the Curves dialog and increase the mask contrast by moving the Curve endpoints as shown



The screenshot shows the Photoshop Curves dialog box. The 'Channel' dropdown is set to 'darken highl...'. The graph shows a curve that has been pulled down at the right end, with a red arrow pointing to the new endpoint. The 'Input' field shows a value of 110. The 'Output' field shows a value of 0. The 'Show Amount of' section is set to 'Light (0-255)'. The 'Show' section has 'Channel Overlays', 'Baseline', 'Histogram', and 'Intersection Line' checked. The 'Preview' checkbox is also checked.

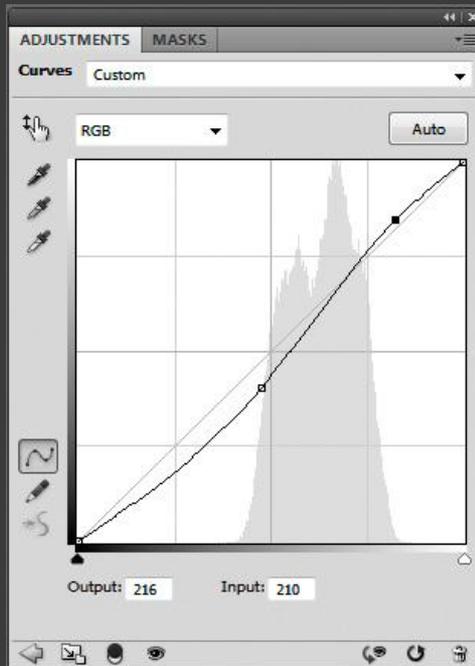
Now only the brightest highlights will be affected by the adjustment



The resulting image is a high-contrast, black and white highlights mask of a rocky landscape. Only the brightest white areas are visible against a black background.

\*Command-M for Mac

# Example: Highlights Mask



Alt-click\* on layer mask to view image again, then increase highlight contrast by making a Curves adjustment

Histogram behind Curve shows data range of image areas (e.g., highlights) selected by mask



Before



After

\*Option-click for Mac

# Example: Highlights Mask

Adjusted image may lose detail/contrast in “busy” areas of mask because adjusted areas blend in with adjacent unadjusted areas

This can be fixed by blurring the mask:

Alt-click\* on layer mask to make the mask visible again

Apply Gaussian Blur with 2.0 pixel radius

Before Gaussian Blur



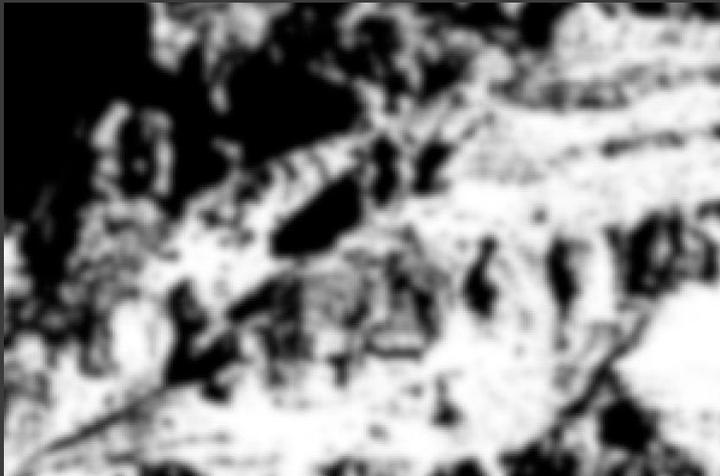
\*Option-click for Mac

# Example: Highlights Mask

Adjusted image may lose detail/contrast in “busy” areas of mask because adjusted areas blend in with adjacent unadjusted areas

Blurring the mask softens its edges to reduce local effects of the adjustment in these “busy” areas (adjustment is applied more uniformly in these areas)

After Gaussian Blur



# Example: Edge Artifacts

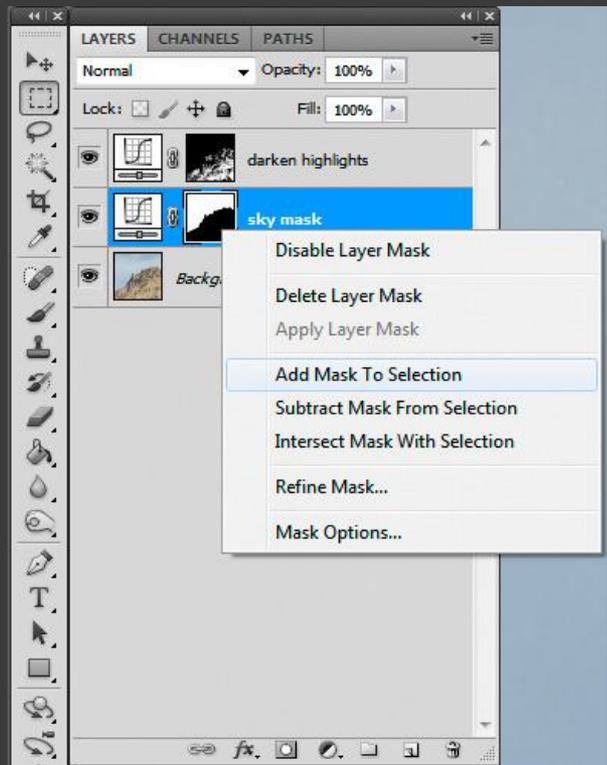
Colored motion artifacts along high-contrast “skyline” edges are fairly common because of refractive air motion (Schlieren noise) (Same effect that causes a distant highway to appear to shimmer on a hot day)

These colored edge areas can often be suppressed to improve image integrity

(image shown at 400% magnification)



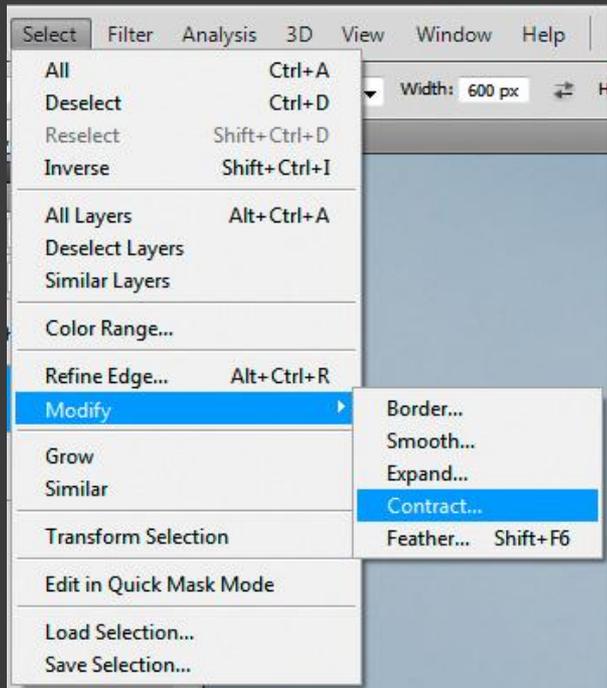
# Example: Edge Artifacts



Start by adding sky mask to  
(no) selection to select sky

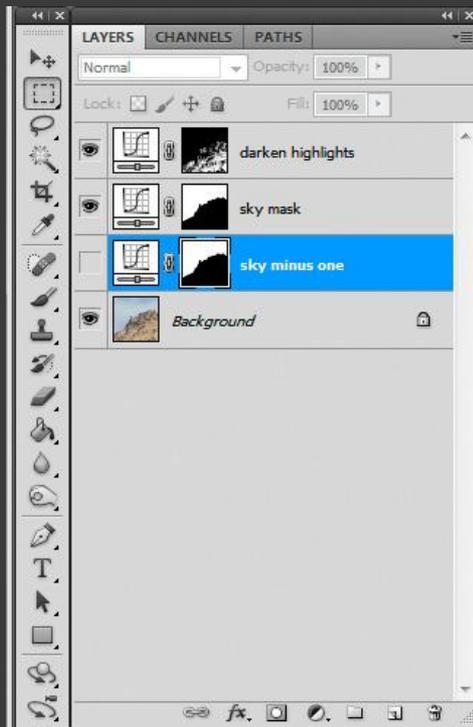


# Example: Edge Artifacts

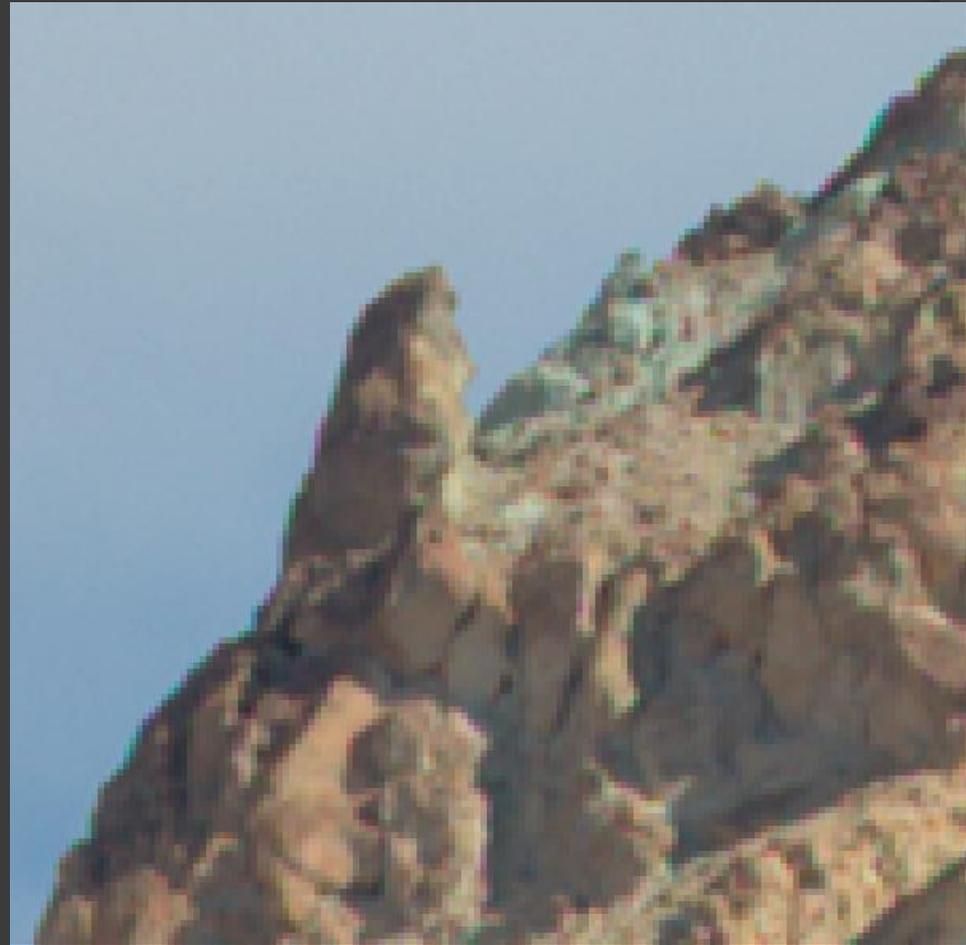


Contract sky selection by one pixel to retract from skyline edge

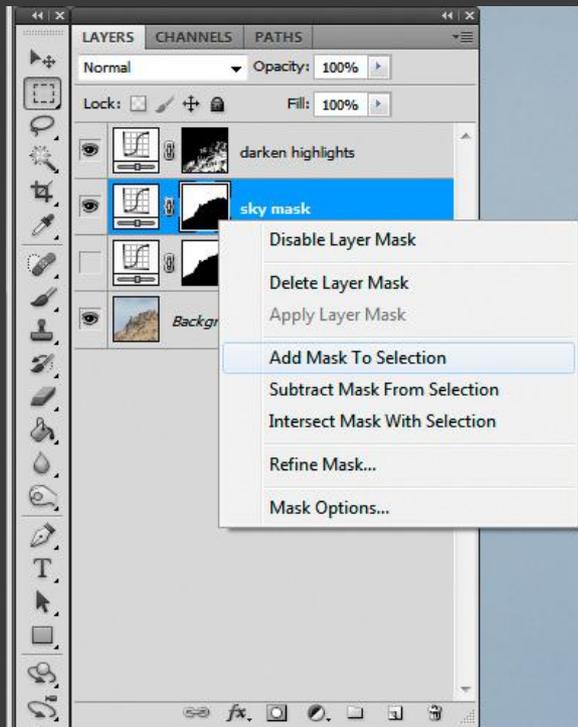
# Example: Edge Artifacts



Create new adjustment layer to hold “sky minus one” mask (doesn’t need to be visible)



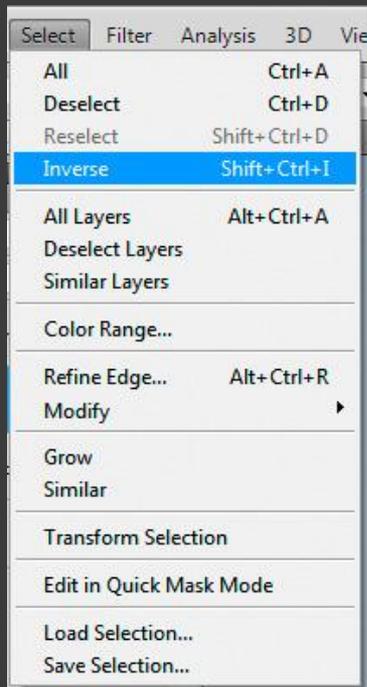
# Example: Edge Artifacts



Add original sky mask to (no) selection again



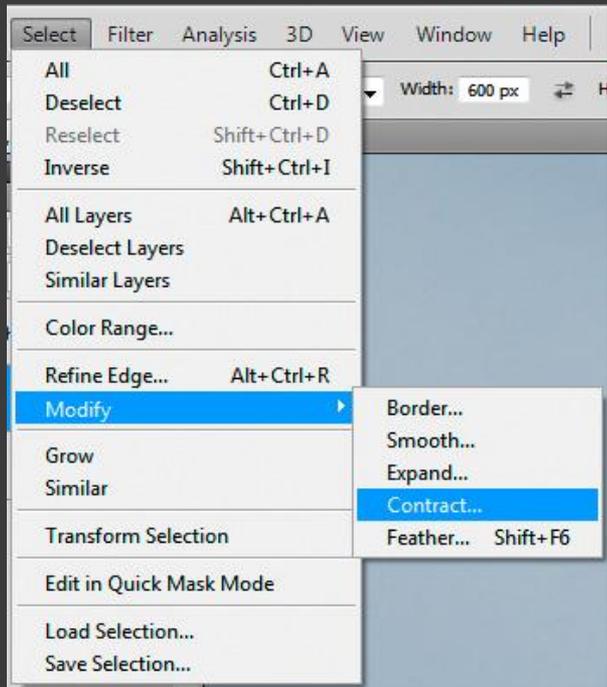
# Example: Edge Artifacts



Select Inverse (everything except sky)

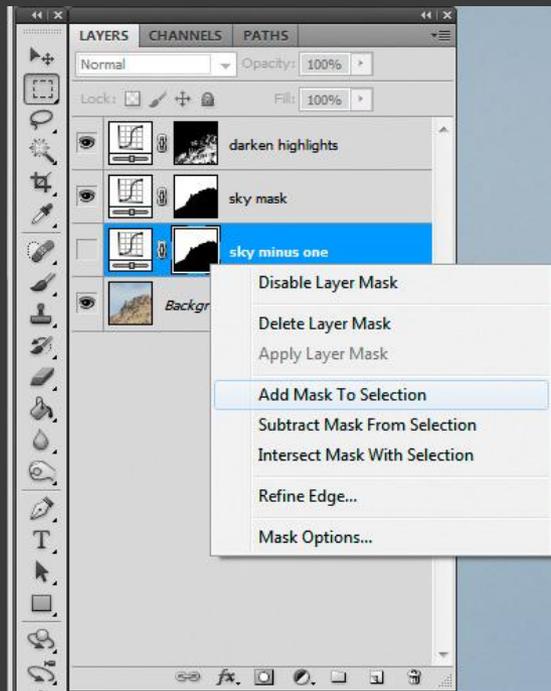


# Example: Edge Artifacts



Contract Inverse sky  
selection by one pixel to  
retract from edge again

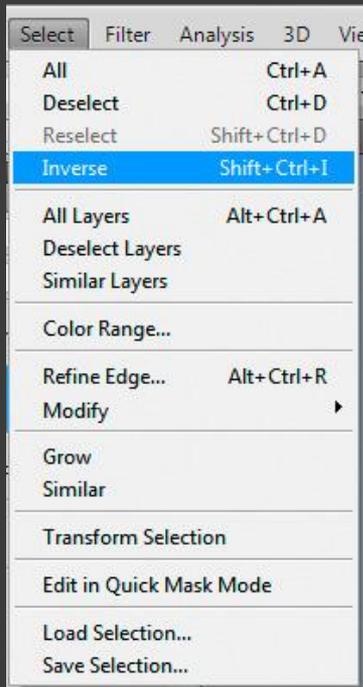
# Example: Edge Artifacts



Now Add “sky minus one”  
mask to selection

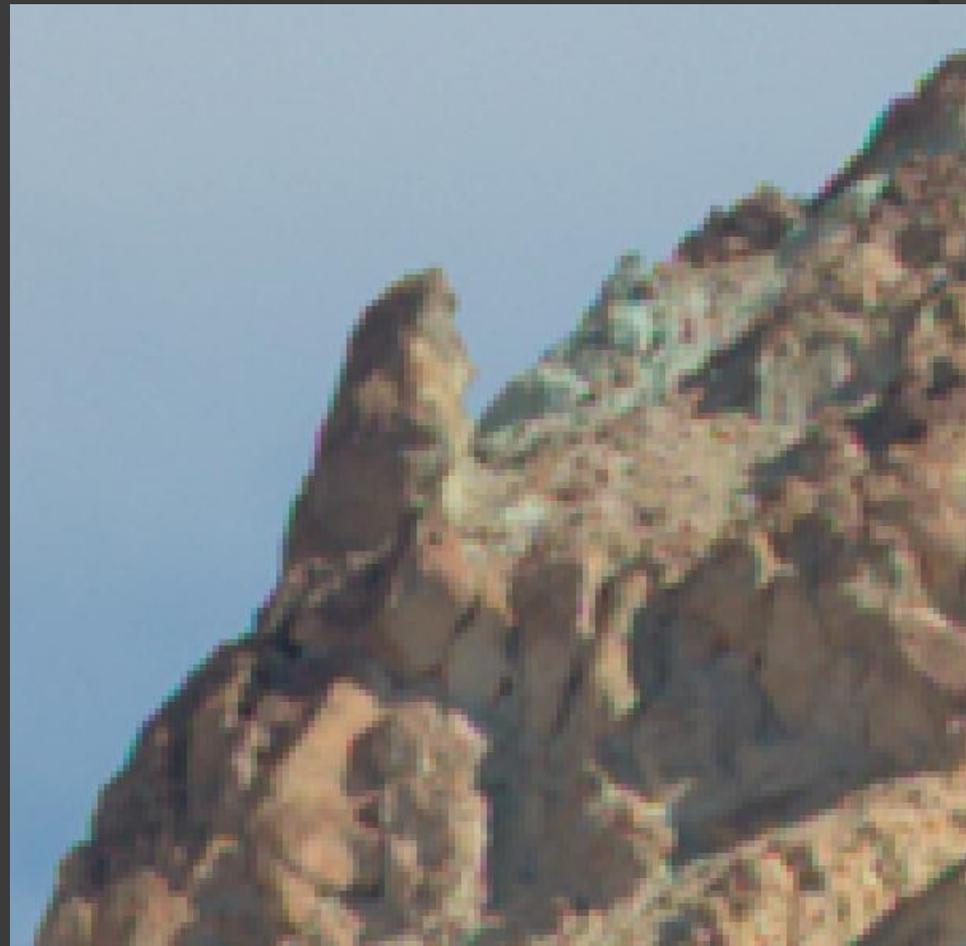
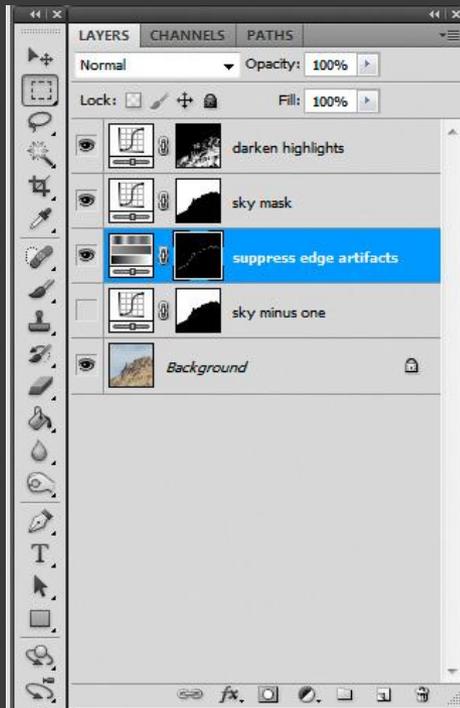


# Example: Edge Artifacts



Finally, select Inverse to only select one pixel either side of skyline edge

# Example: Edge Artifacts



Create new Hue/Saturation layer (uses skyline selection as mask)

# Example: Edge Artifacts

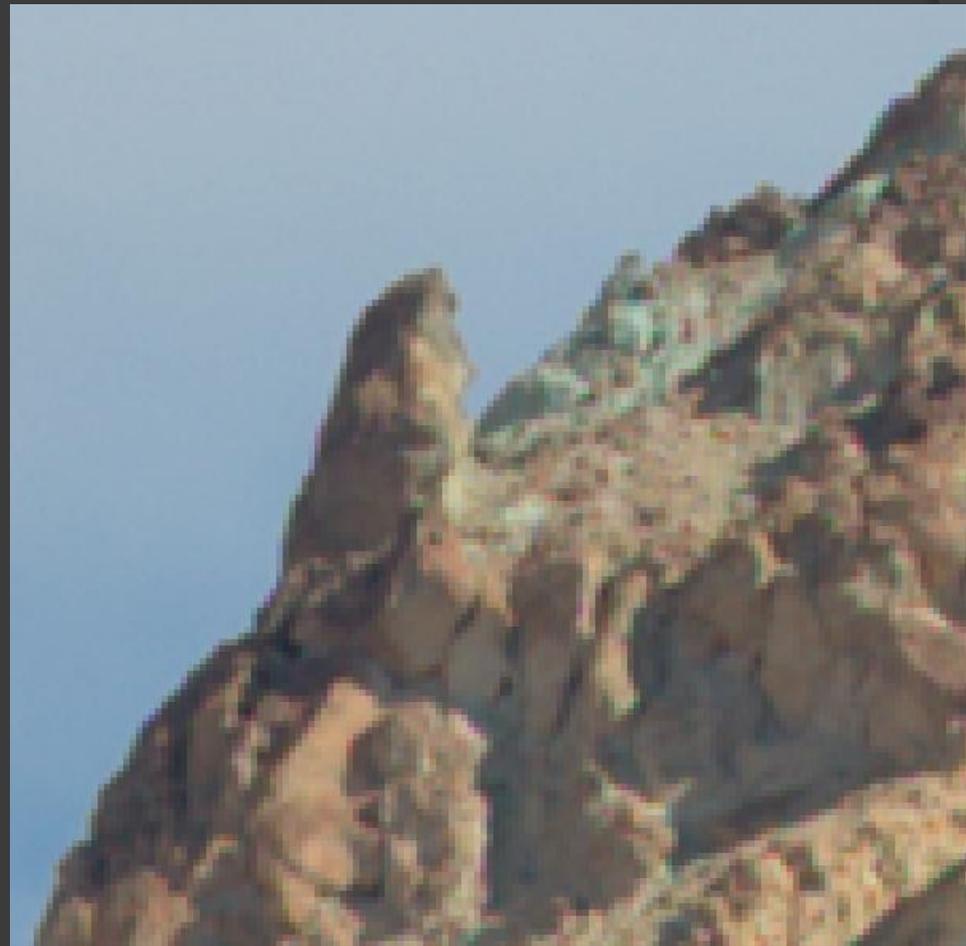
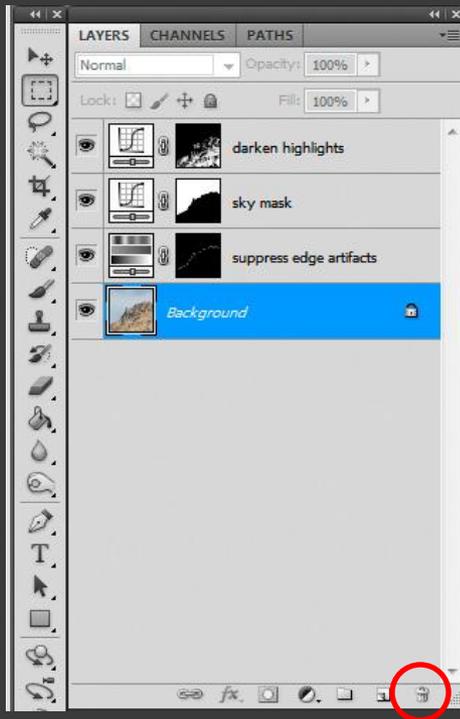
In the new Hue/Saturation layer, turn Master Saturation down to -90

Then turn Blue Saturation back up to +90

This will desaturate all colors along the masked skyline edge except the blue sky, effectively suppressing the edge motion artifacts

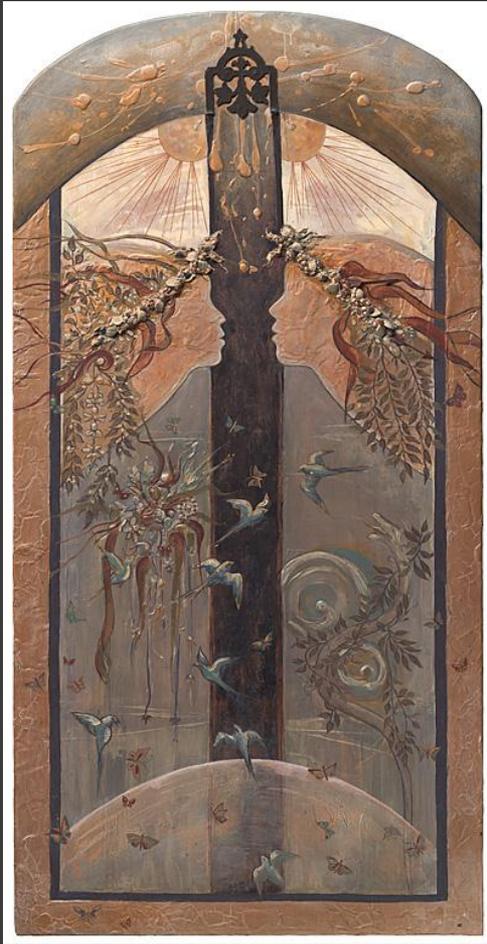


# Example: Edge Artifacts



Highlight “sky minus one” layer and delete it by hitting Backspace key or by dragging it to Trash icon

# Example: Fried Highlights



“The Wedding” (2002) by Sophia Tsavalas  
Mixed media on copper and wood including shells, beads, and metallic paints



# Example: Fried Highlights

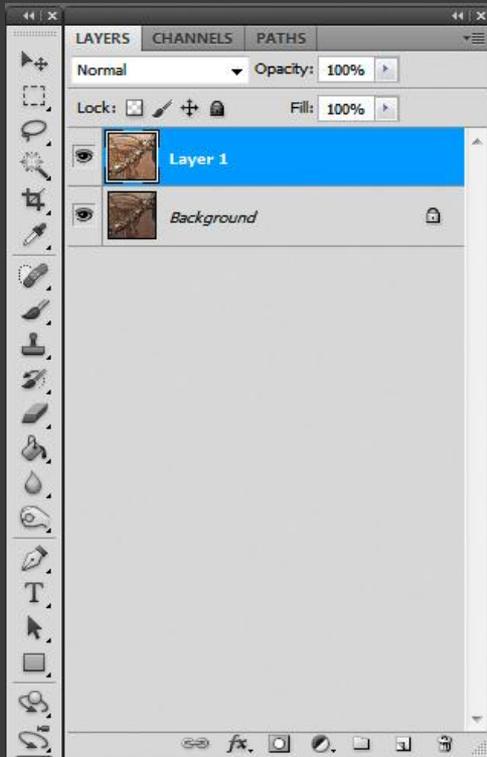
Normal scan exhibits  
overexposed highlights



A second scan was made,  
one f-stop underexposed

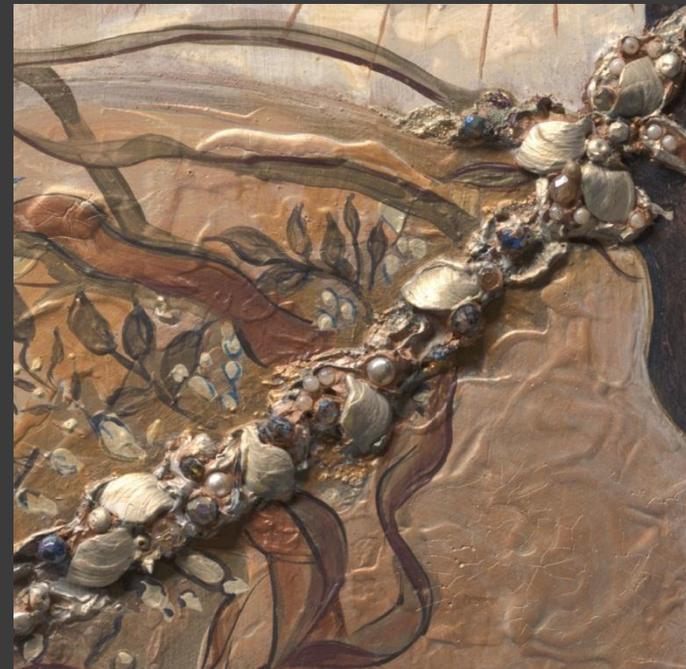


# Example: Fried Highlights

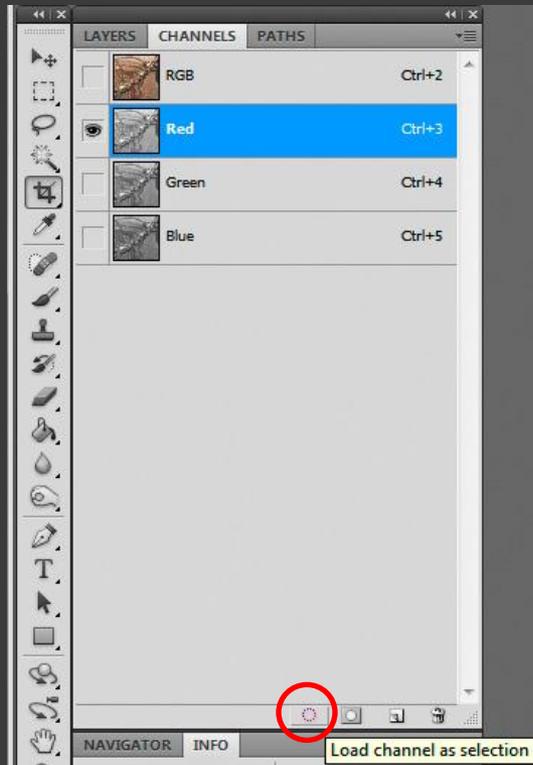


Entire normally-exposed image is copied & pasted into underexposed image, creating a second layer on top of underexposed image

If nothing is disturbed between the two scans, they should be perfectly aligned without any effort

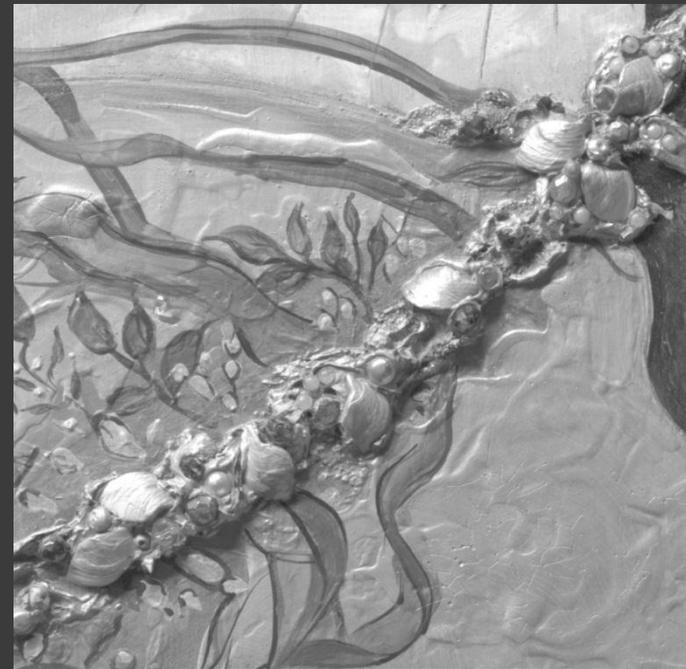


# Example: Fried Highlights

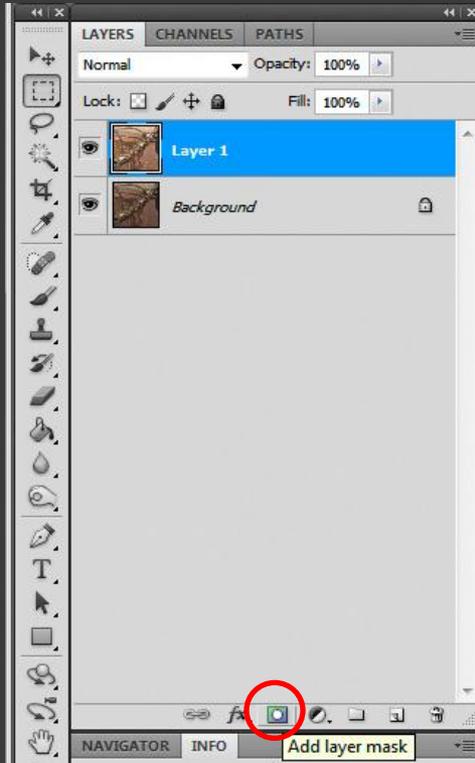


Make sure new layer (normal scan) is visible and selected, switch to Channels, select red channel, and load this channel as a selection

(red channel of normal scan exhibits the most overexposure)



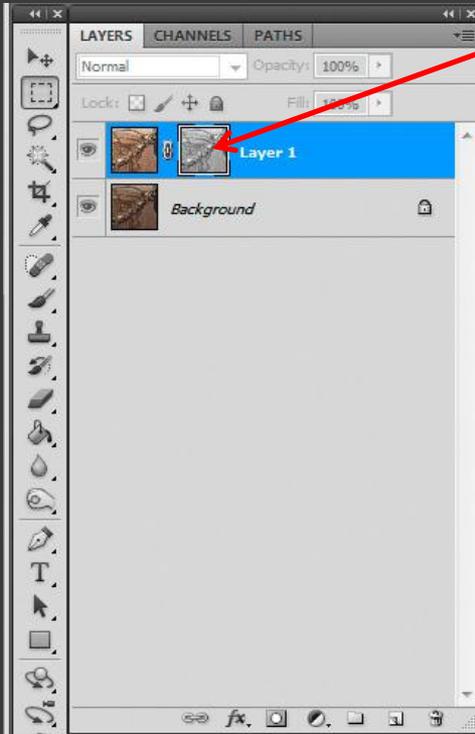
# Example: Fried Highlights



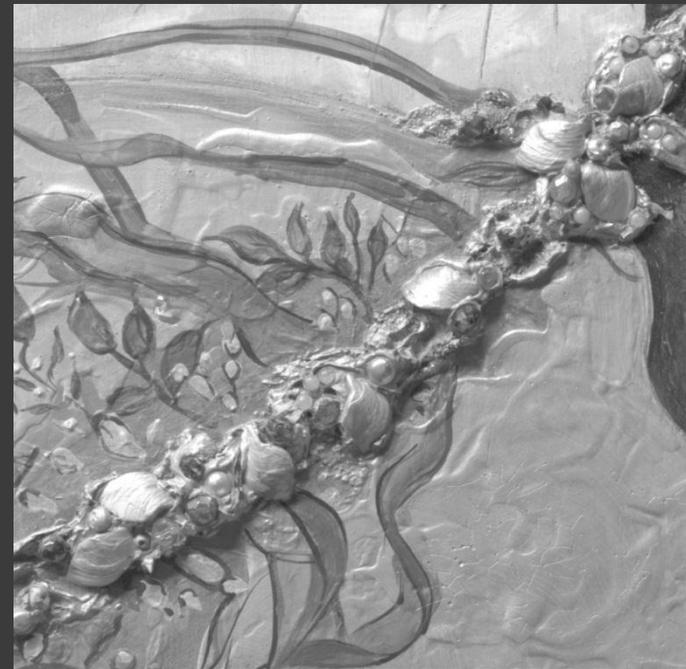
Switch back to Layers (normal scan layer is still selected), and add layer mask using newly-created (red channel) selection



# Example: Fried Highlights

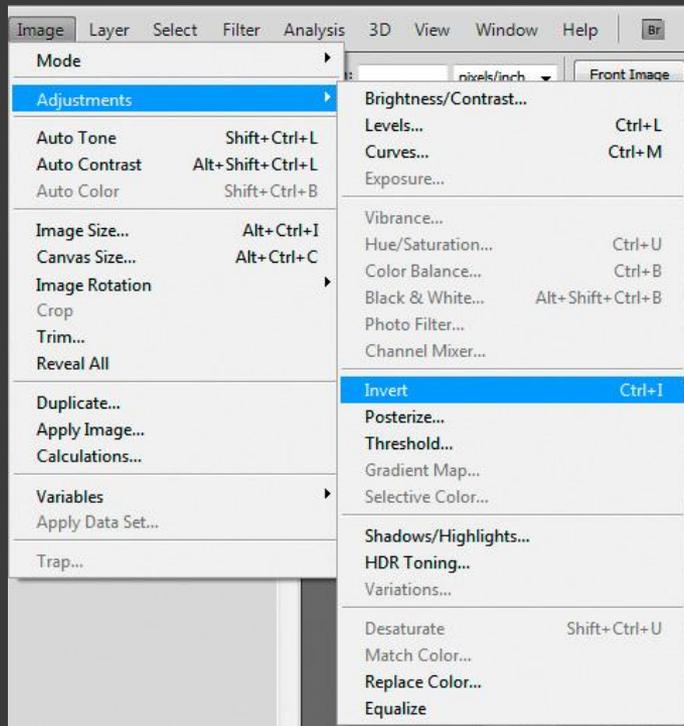


Alt-click\* on the new layer mask icon to make the mask visible

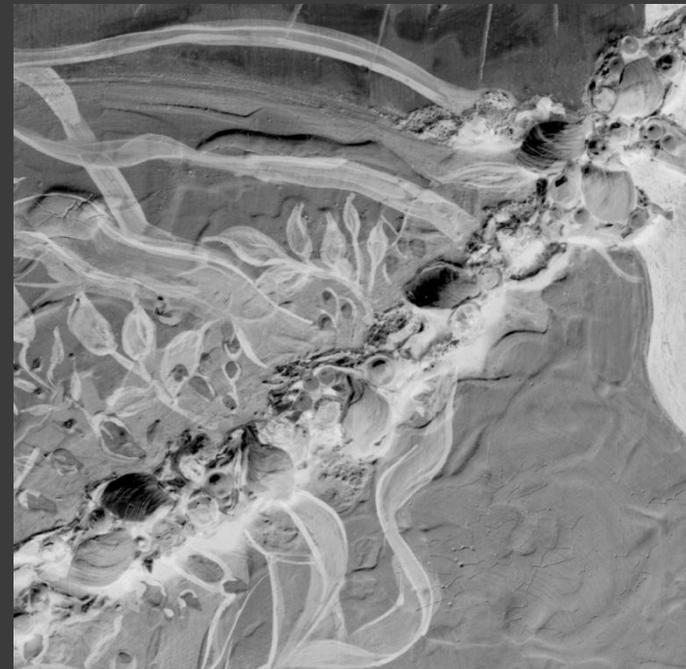


\*Option-click for Mac

# Example: Fried Highlights

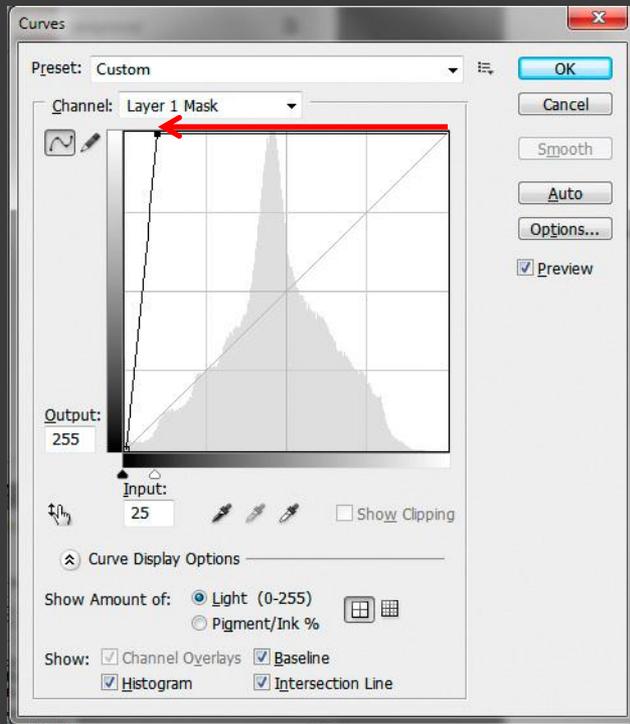


Invert the mask so brightest image highlights become darkest mask areas

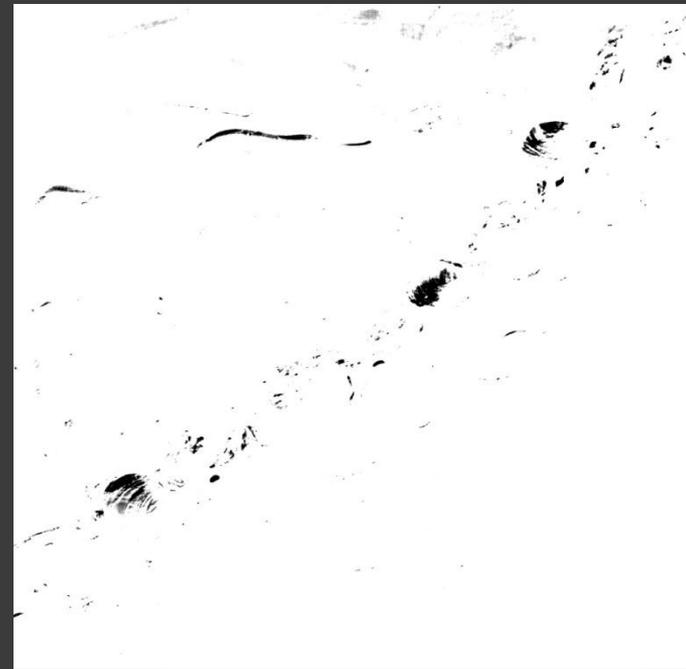


For an image layer mask:  
White = **allow** (show) image layer (opaque)  
Black = **prevent** (hide) image layer (**transparent**)  
Gray = **partially** show/hide image layer (semi)

# Example: Fried Highlights

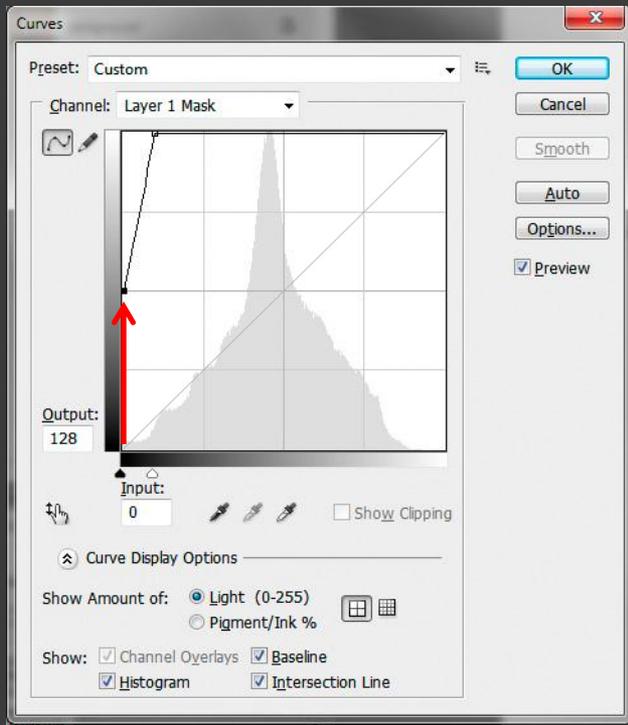


Use Control-M\* to bring up Curves dialog, and adjust white end of curve to make all but darkest mask areas white

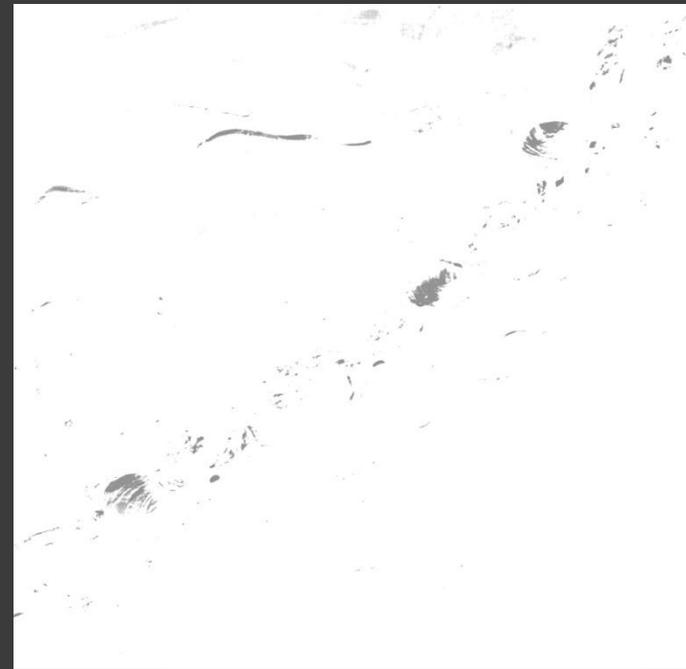


\*Command-M for Mac

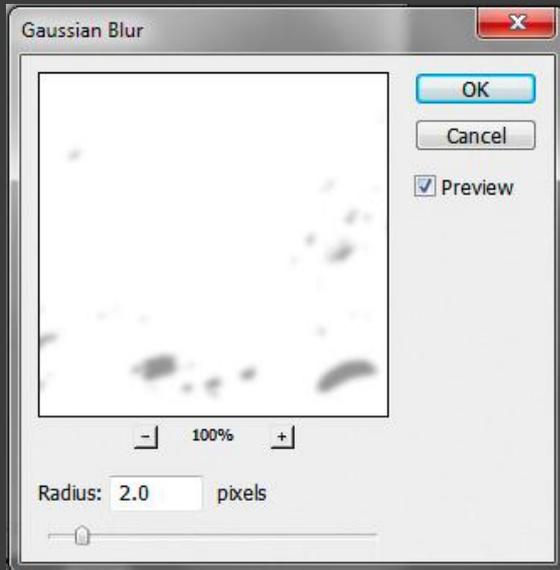
# Example: Fried Highlights



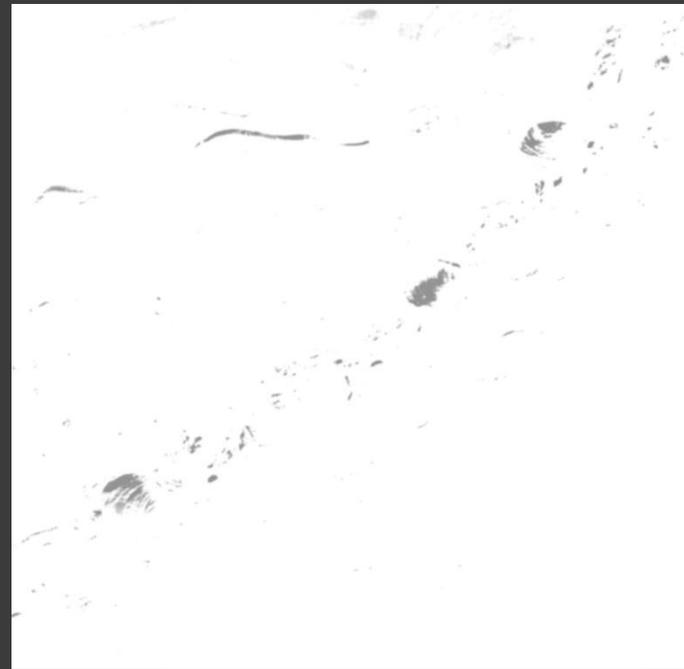
Trial and error indicated that only partial masking was needed for the most natural-looking highlights, so lighten darkest mask areas by adjusting dark end of curve upward



# Example: Fried Highlights



Finally, blur the mask to soften highlight transitions between layers, then Alt-click\* on the mask icon to view the image again



\*Option-click for Mac

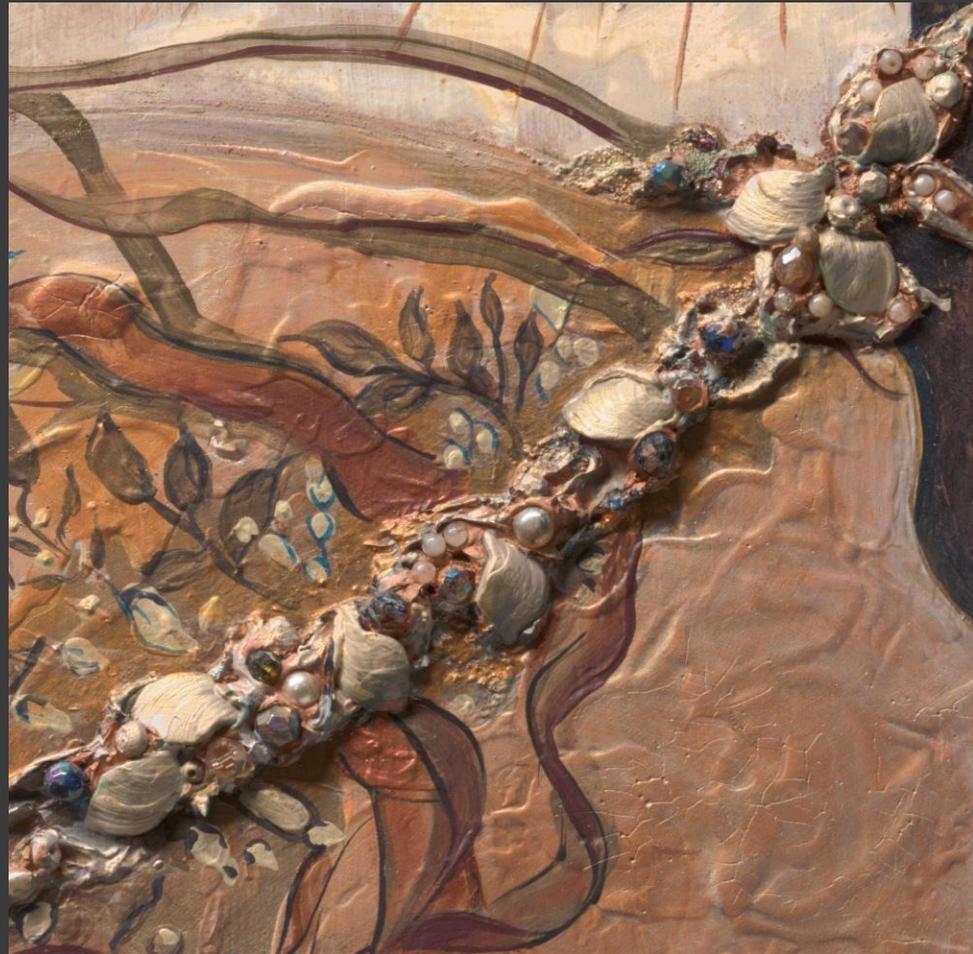
# Example: Fried Highlights

BEFORE: Normal scan exhibits overexposed highlights  
(aggravated by metallic paint on three-dimensional objects)



# Example: Fried Highlights

AFTER: Dark areas in mask for normal exposure layer allow just enough underexposed highlights to show through in overexposed areas (image layer becomes transparent in black areas of its mask)



# Example 2: Fried Highlights



“Persephones Undiving” (2002)  
by Sophia Tsavalas

Mixed media on wood including  
lace, pearls, and metallic paint



# Example 2: Fried Highlights

BEFORE: Normal scan exhibits overexposed highlights

Exactly the same method, step for step, was used to repair these overexposed areas as was used for the previous example (mask Curve adjustment was slightly different)



# Example 2: Fried Highlights

AFTER: Dark areas in mask for normal exposure layer allow just enough underexposed highlights to show through in overexposed areas (image layer becomes transparent in black areas of its mask)

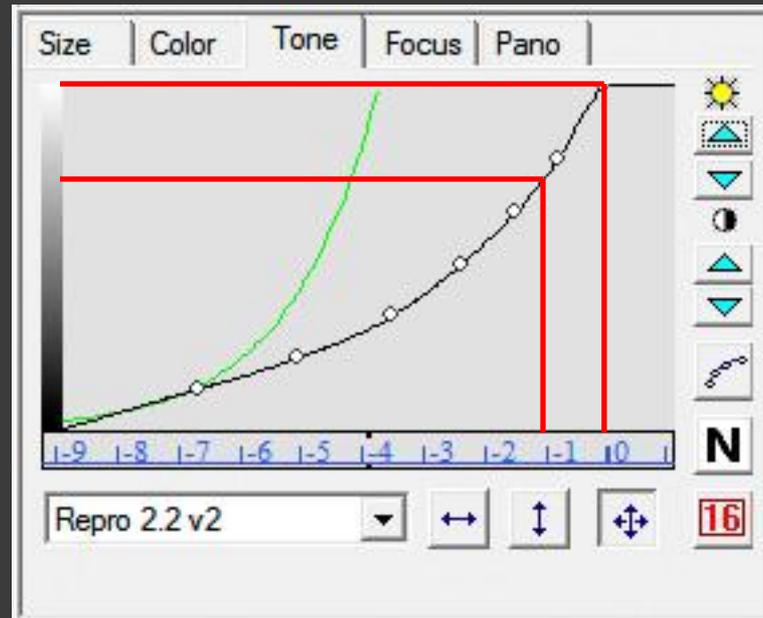


# Overexposed Highlight Repair

- ⦿ In situations similar to the preceding examples, masking two image layers made with different exposures might **eliminate the need for cross-polarizing**
- ⦿ Benefits include:
  - faster scan times
  - improved image quality
  - more accurate color
  - more precise control of highlight rendition

# Overexposed Highlight Repair

Reducing the exposure of scanned artwork by one f-stop is usually (more than) enough because the recommended Repto 2.2 v2 Tone curve has such steep highlight contrast (Can reduce exposure even more if necessary)



# Example: Metallic Paint

“Ancestral Ascent” (2000)  
by Sophia Tsavalas  
painted wood triptych,  
including metallic paint



# Example: Metallic Paint

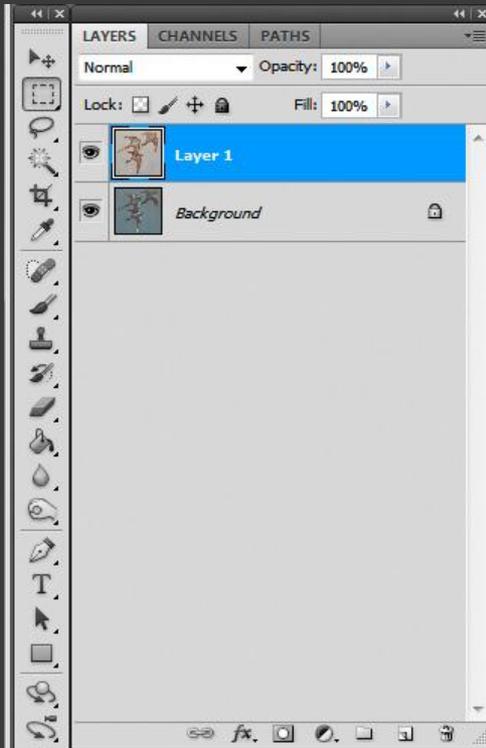
Normal scan lighting didn't reveal gold highlights very well, no matter what we tried



A second scan was made with "hard" (6500K) lighting, two f-stops underexposed



# Example: Metallic Paint



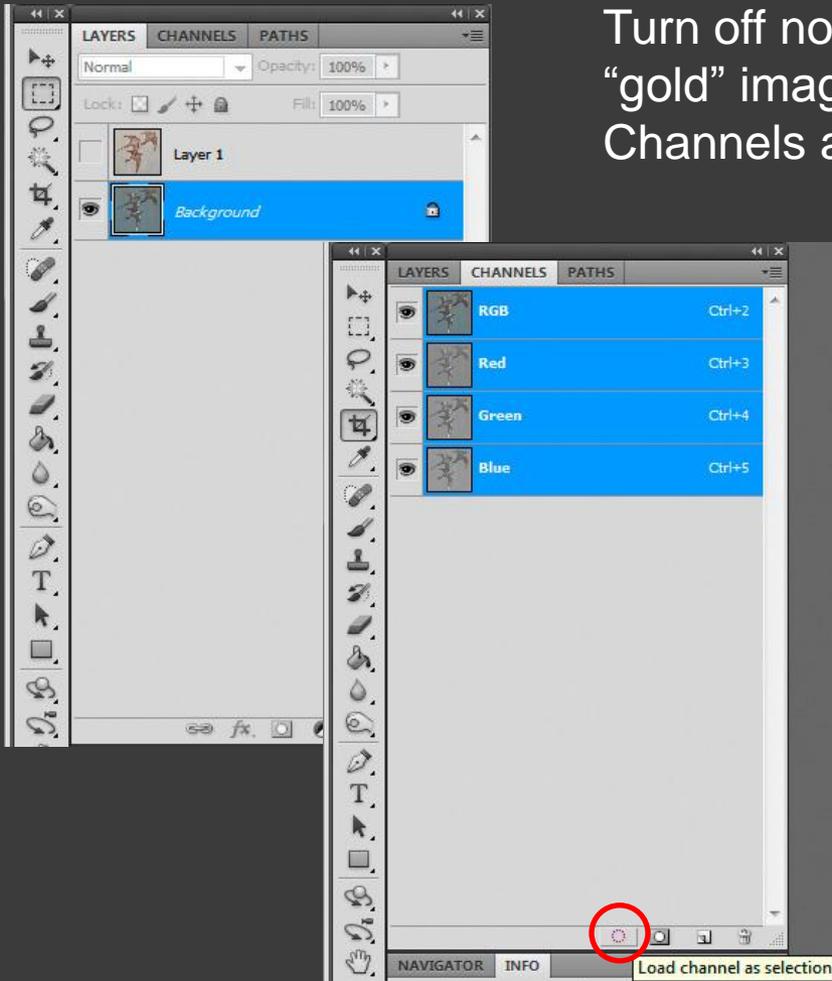
Entire normally-exposed image is copied & pasted into underexposed image, creating a second layer on top of underexposed image

If nothing is disturbed between the two scans, they should be perfectly aligned without any effort

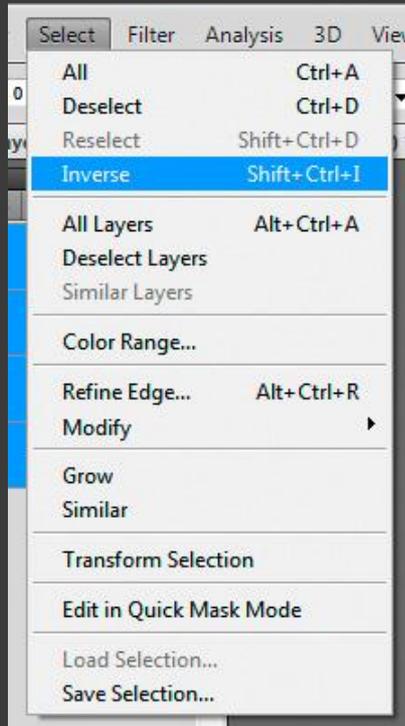


# Example: Metallic Paint

Turn off normal layer, make sure underexposed “gold” image layer is selected, then switch to Channels and load (all) channels as selection



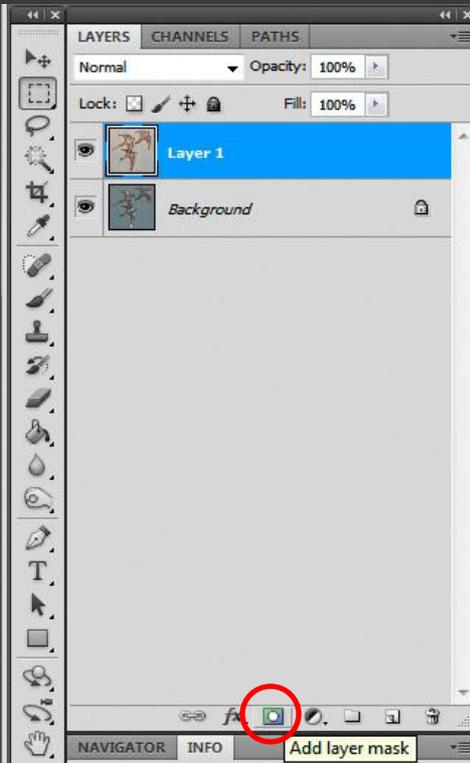
# Example: Metallic Paint



Since mask needs to be dark in gold areas,  
Invert selection before making mask



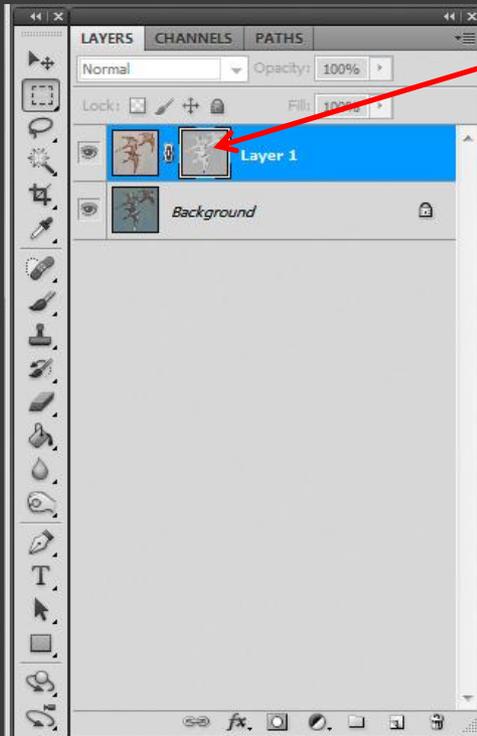
# Example: Metallic Paint



Switch back to Layers, enable and select normal exposure layer, then add layer mask using existing (inverted gold) selection



# Example: Metallic Paint

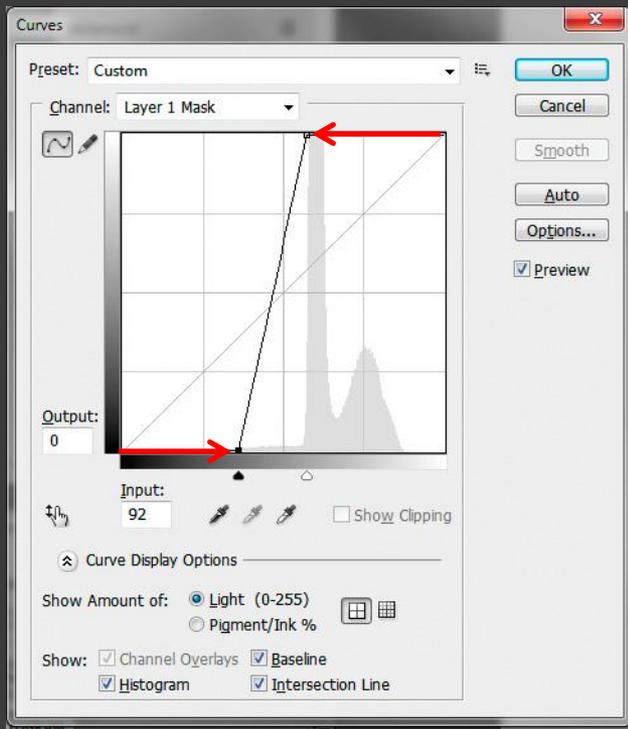


Alt-click\* on the new layer mask icon to make the mask visible

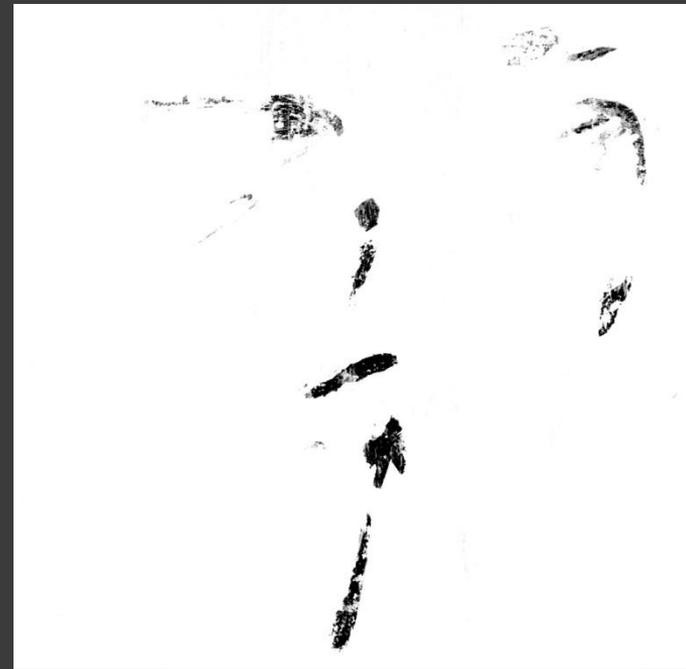


\*Option-click for Mac

# Example: Metallic Paint

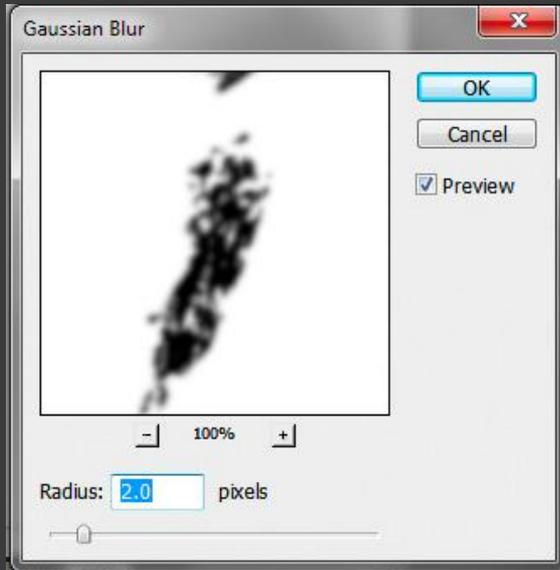


Use Control-M\* to bring up Curves dialog, and adjust both ends of curve to make all but darkest mask areas white, and make darkest areas almost black

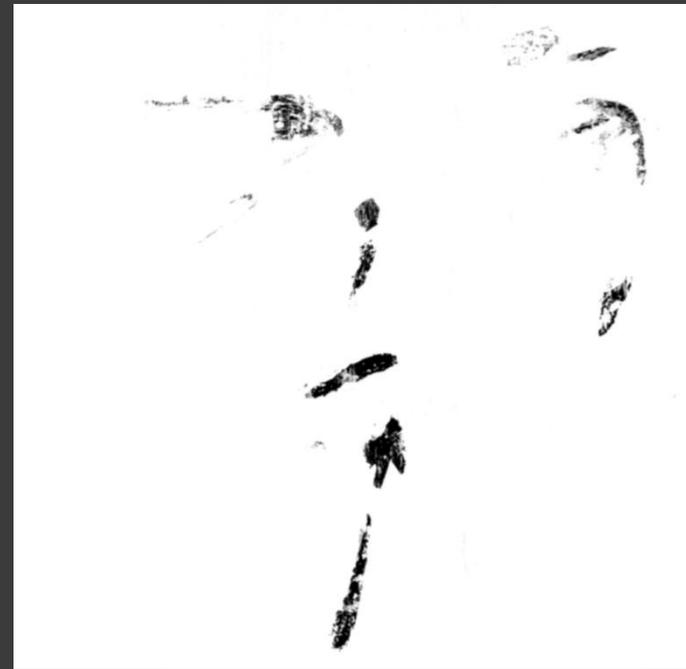


\*Command-M for Mac

# Example: Metallic Paint



Finally, blur the mask to soften highlight transitions between layers, then Alt-click\* on the mask icon to view the image again



\*Option-click for Mac

# Example: Metallic Paint

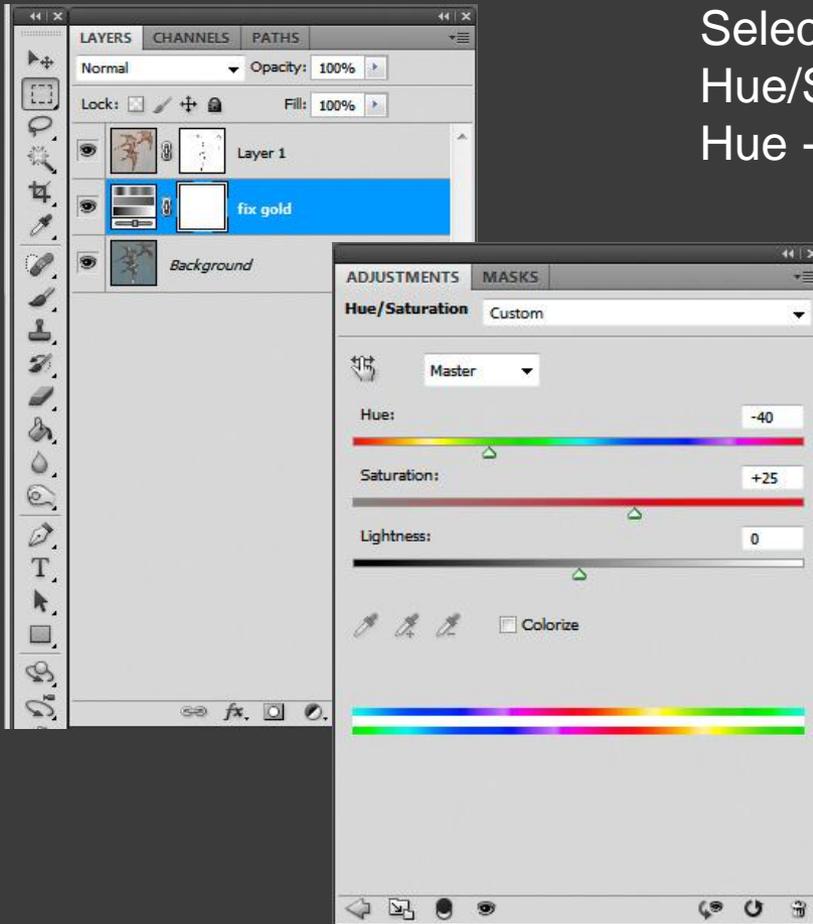
Masked result is much better, but gold is wrong color because gold scan used 6500K lighting without re-balancing

(gold scan is too blue, so gold is too green)

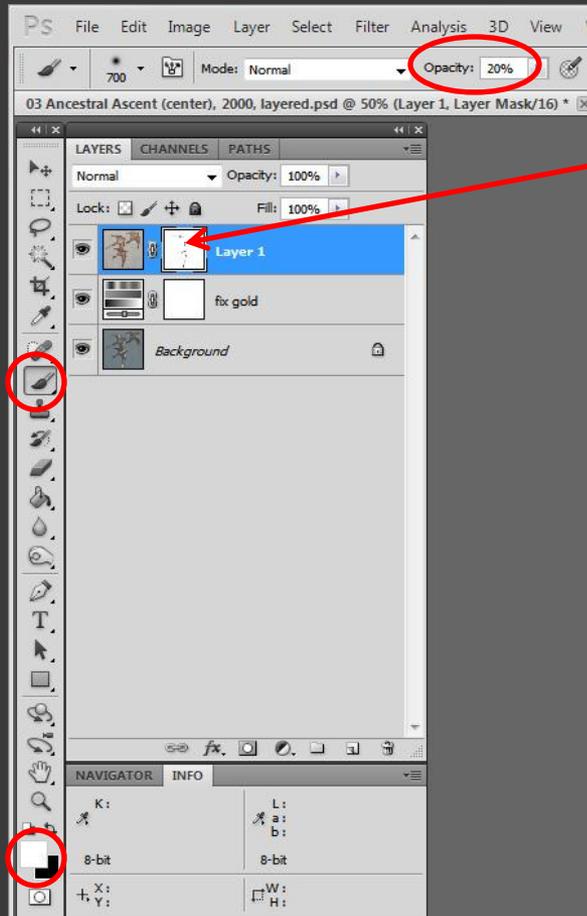


# Example: Metallic Paint

Select bottom (gold) layer, Add new Hue/Saturation adjustment layer, shift Hue -40 and boost Saturation +25



# Example: Metallic Paint



To reduce excessive gold in specific areas, click on normal scan layer mask to select it, then paint desired areas white with a low-opacity (e.g., 20%) brush



# Example: Metallic Paint

BEFORE: Normal scan didn't reveal metallic gold paint regardless of the lighting tricks we tried, perhaps because of the subject's light background



# Example: Metallic Paint

AFTER: Capturing a second scan lit specifically to show the metallic gold paint, and then layering, masking, and adjusting the two scans as described yielded a much better representation of the original artwork



# Advanced Image Masking

- These examples are only a sampling of what can be accomplished using the multitude of selection and masking tools available in Adobe Photoshop
- Making your own selections and masks provides **unparalleled control** for adjusting and/or blending images using **time-honored principles** as old as photography itself
- Differentiate your results from everybody else using the same “semi-automatic” digital processing routines