

Excel for Hydrology

Section 4



Conditional Formatting

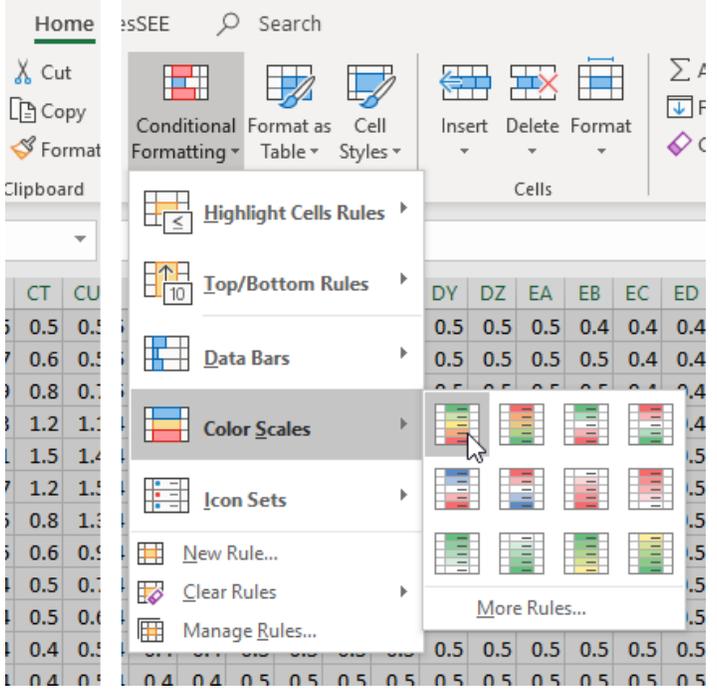
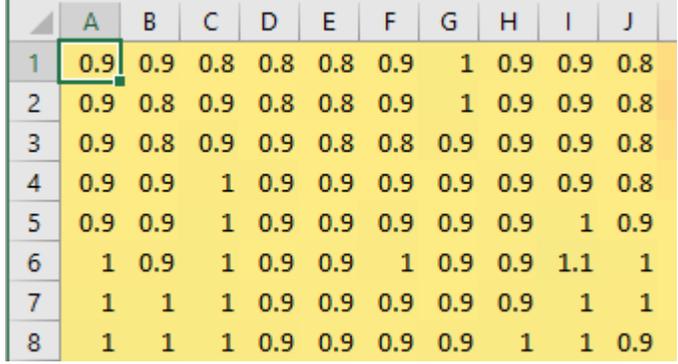
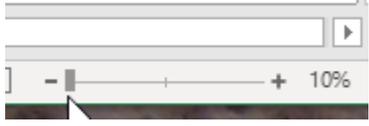
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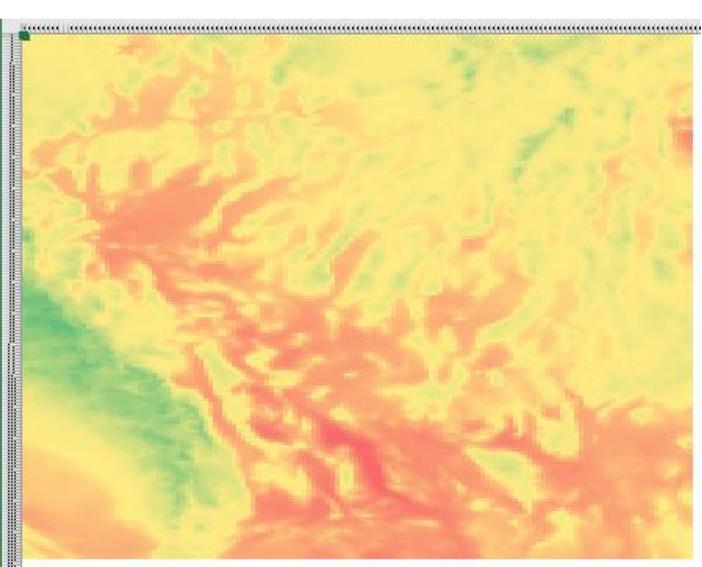
04_ConditionalFormatting

Conditional formatting serves as a quick check for 2D arrays.

Quick shading of arrays – 01_PRISM_4.0km.NV.xlsx

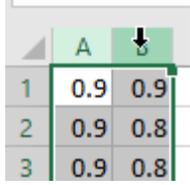
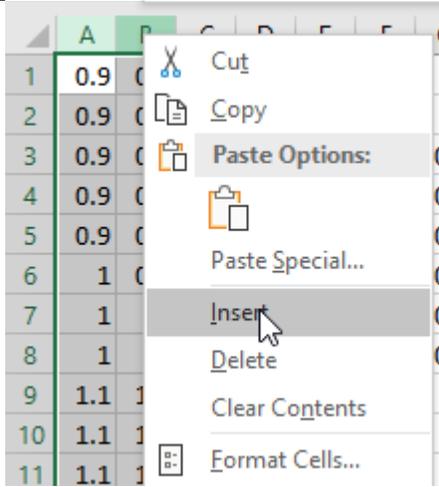
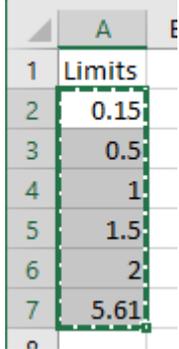
<p>Select range A1:EM168.</p> <p>Select Home tab on ribbon,</p> <p>Select “Conditional Formatting”,</p> <p>Select first option under “Color Scales.”</p>	 <p>The screenshot shows the Excel ribbon with the 'Home' tab selected. The 'Conditional Formatting' dropdown menu is open, and the 'Color Scales' option is highlighted. A sub-menu is visible, showing various color scale options. The background shows a grid of data with values ranging from 0.4 to 1.5.</p>																																																																																																			
<p>Selected range will be shaded.</p>	 <p>The screenshot shows an Excel spreadsheet with columns A through J and rows 1 through 8. The range A1:EM168 is shaded in yellow. The data in the range is as follows:</p> <table border="1"><thead><tr><th></th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th><th>H</th><th>I</th><th>J</th></tr></thead><tbody><tr><td>1</td><td>0.9</td><td>0.9</td><td>0.8</td><td>0.8</td><td>0.8</td><td>0.9</td><td>1</td><td>0.9</td><td>0.9</td><td>0.8</td></tr><tr><td>2</td><td>0.9</td><td>0.8</td><td>0.9</td><td>0.8</td><td>0.8</td><td>0.9</td><td>1</td><td>0.9</td><td>0.9</td><td>0.8</td></tr><tr><td>3</td><td>0.9</td><td>0.8</td><td>0.9</td><td>0.9</td><td>0.8</td><td>0.8</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.8</td></tr><tr><td>4</td><td>0.9</td><td>0.9</td><td>1</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.8</td></tr><tr><td>5</td><td>0.9</td><td>0.9</td><td>1</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.9</td><td>1</td><td>0.9</td></tr><tr><td>6</td><td>1</td><td>0.9</td><td>1</td><td>0.9</td><td>0.9</td><td>1</td><td>0.9</td><td>0.9</td><td>1.1</td><td>1</td></tr><tr><td>7</td><td>1</td><td>1</td><td>1</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.9</td><td>1</td><td>1</td></tr><tr><td>8</td><td>1</td><td>1</td><td>1</td><td>0.9</td><td>0.9</td><td>0.9</td><td>0.9</td><td>1</td><td>1</td><td>0.9</td></tr></tbody></table>		A	B	C	D	E	F	G	H	I	J	1	0.9	0.9	0.8	0.8	0.8	0.9	1	0.9	0.9	0.8	2	0.9	0.8	0.9	0.8	0.8	0.9	1	0.9	0.9	0.8	3	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.8	4	0.9	0.9	1	0.9	0.9	0.9	0.9	0.9	0.9	0.8	5	0.9	0.9	1	0.9	0.9	0.9	0.9	0.9	1	0.9	6	1	0.9	1	0.9	0.9	1	0.9	0.9	1.1	1	7	1	1	1	0.9	0.9	0.9	0.9	0.9	1	1	8	1	1	1	0.9	0.9	0.9	0.9	1	1	0.9
	A	B	C	D	E	F	G	H	I	J																																																																																										
1	0.9	0.9	0.8	0.8	0.8	0.9	1	0.9	0.9	0.8																																																																																										
2	0.9	0.8	0.9	0.8	0.8	0.9	1	0.9	0.9	0.8																																																																																										
3	0.9	0.8	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.8																																																																																										
4	0.9	0.9	1	0.9	0.9	0.9	0.9	0.9	0.9	0.8																																																																																										
5	0.9	0.9	1	0.9	0.9	0.9	0.9	0.9	1	0.9																																																																																										
6	1	0.9	1	0.9	0.9	1	0.9	0.9	1.1	1																																																																																										
7	1	1	1	0.9	0.9	0.9	0.9	0.9	1	1																																																																																										
8	1	1	1	0.9	0.9	0.9	0.9	1	1	0.9																																																																																										
<p>Reduce zoom enough that entire array is visible in window, ctrl+wheel</p>	 <p>The screenshot shows the Windows taskbar with the zoom level set to 10%. The zoom slider is visible, and the text '10%' is displayed next to it.</p>																																																																																																			

Inspect array for lows, highs, and patterns to ensure array is correct.



Shading can be more controlled with specified bands and changed easily if limits are defined in cells.

01_PRISM_4.0km.NV.xlsx – Specified shading of arrays

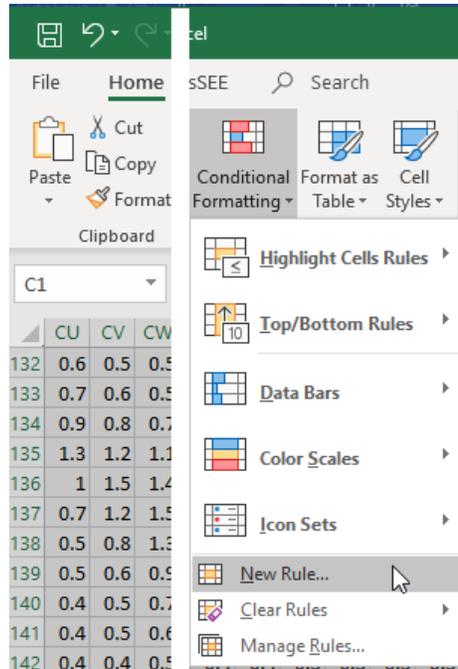
<p>Insert 2 new columns by, Highlighting columns A and B.</p>	
<p>Right-click while arrow (↓) appears. Select Insert option on form.</p>	
<p>Select range of precipitation and note minimum and maximum precipitation rates are 0.15 and 5.61 ft/yr in the Status Bar.</p>	
<p>Specify 0.15, 0.5, 1, 1.5, 2, and 5.61 ft/yr in the range A2:A7 to define ranges to be shaded.</p>	

Select range C1:EO168.

Select Home tab on ribbon,

Select "Conditional Formatting",

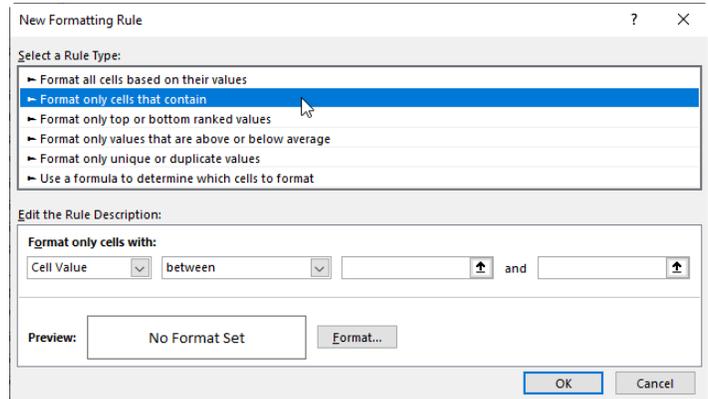
Select "New Rule..."



"New Formatting Rule" form will appear.

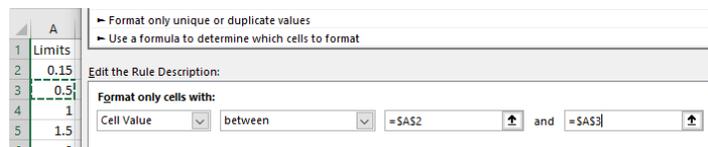
Select 2nd option,

"Format only cells that contain."



Edit rule description to read,

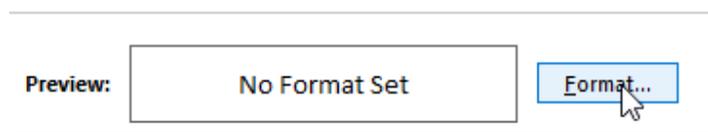
Cell value between =\$A\$2 and =\$A\$3.



Select Format... on "New Formatting Rule"

form to specify shading, font, etc. of

conditional format.

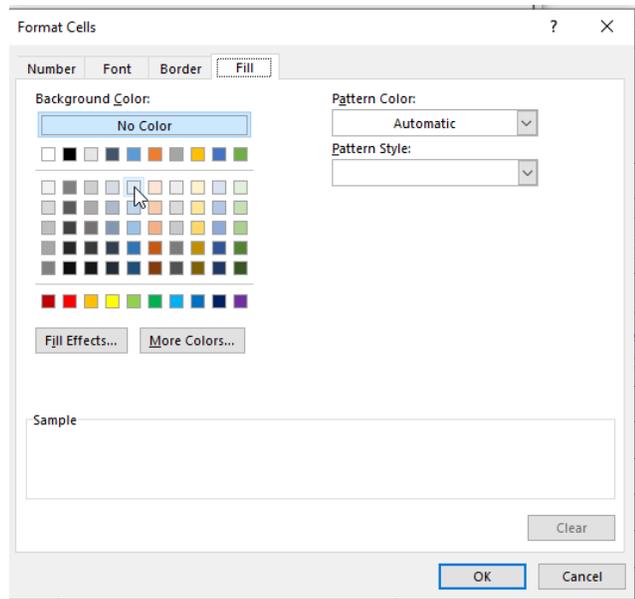


Format cells form will appear.

Select Fill tab.

Select a light blue.

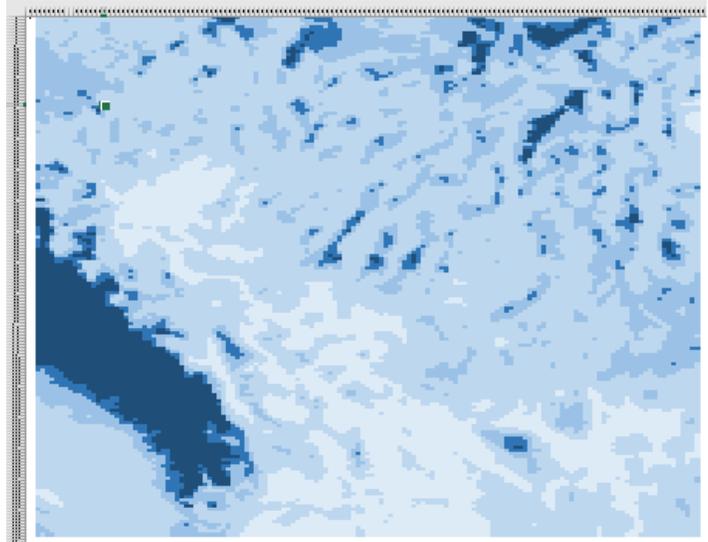
Select OK on forms until all forms are closed.



Shading has been specified for precipitation rates between 0.15 and 0.5 ft/yr as defined in cells \$A\$2 and \$A\$3.



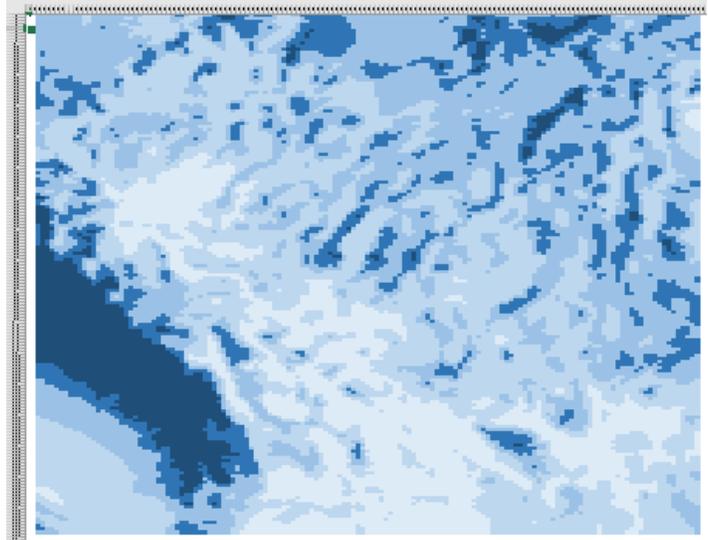
Repeat until all ranges are defined.



Change values in column A to manipulate color breaks.

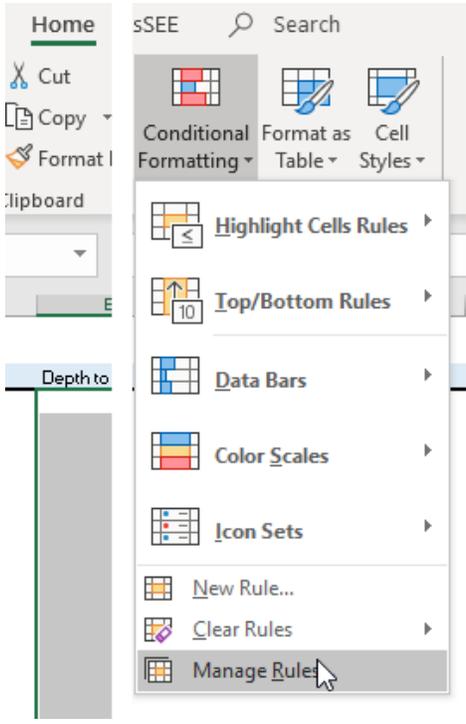
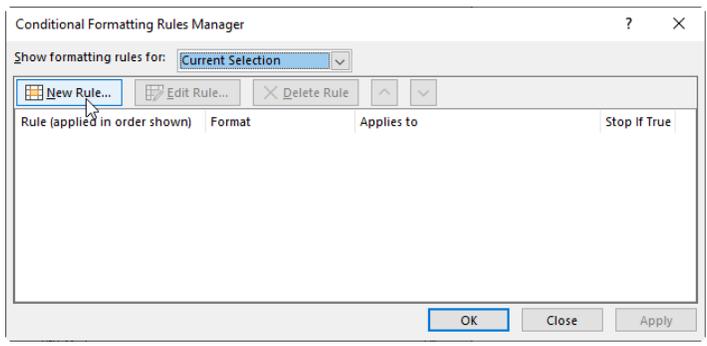
Cell A4 changed from 1.0 to 0.8

Cell A5 changed from 1.5 to 1.2



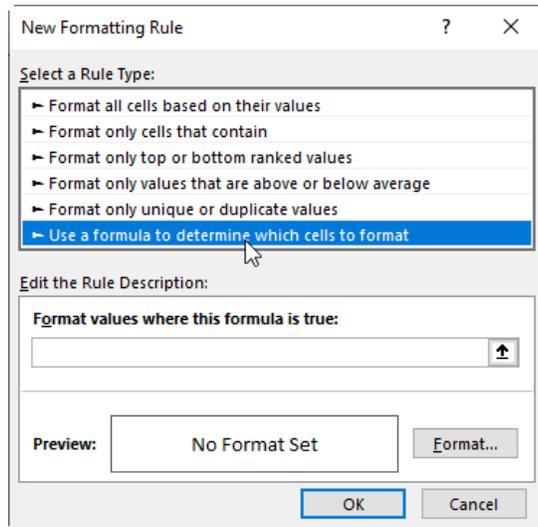
Every other row in a table can be shaded for readability with conditional formatting, where conditions are specified with a user-defined equation.

02_CHV_StandardizedLOG.xlsm – Alternate shading of rows

<p>Select range B4:D49.</p> <p>Select Home tab on ribbon,</p> <p>Select “Conditional Formatting”,</p> <p>Select “Manage Rules”.</p>	 <p>The screenshot shows the Excel ribbon with the 'Home' tab selected. The 'Conditional Formatting' dropdown menu is open, displaying options such as 'Highlight Cells Rules', 'Top/Bottom Rules', 'Data Bars', 'Color Scales', 'Icon Sets', 'New Rule...', 'Clear Rules', and 'Manage Rules'. A mouse cursor is pointing at the 'Manage Rules' option.</p>
<p>Conditional Formatting Rules Manager form will appear.</p> <p>Click “New Rule...”</p>	 <p>The screenshot shows the 'Conditional Formatting Rules Manager' dialog box. The 'Show formatting rules for:' dropdown is set to 'Current Selection'. The 'New Rule...' button is highlighted with a mouse cursor. The dialog box contains a table with columns for 'Rule (applied in order shown)', 'Format', 'Applies to', and 'Stop if True'. At the bottom, there are 'OK', 'Close', and 'Apply' buttons.</p>

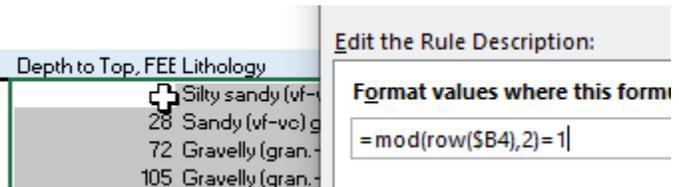
“New Formatting Rule” form will appear.

Select last option,
 “Use a formula to determine which cells to format.”



Enter equation in “Format values where this formula is true:”, which is
 $=\text{mod}(\text{row}(\$B4),2)=1$

\$B4 is the upper, left corner of the selected area and is fixed with respect to column B.



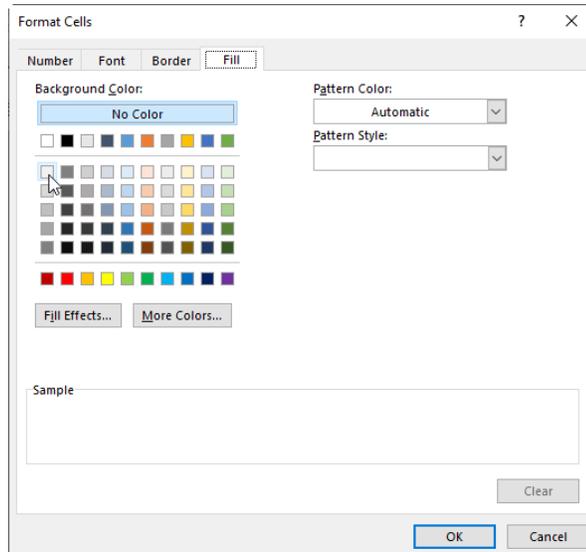
Click “Format...” button

Format cells form will appear.

Select Fill tab.

Select lightest grey.

Select OK on forms until all forms are closed.

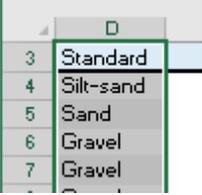
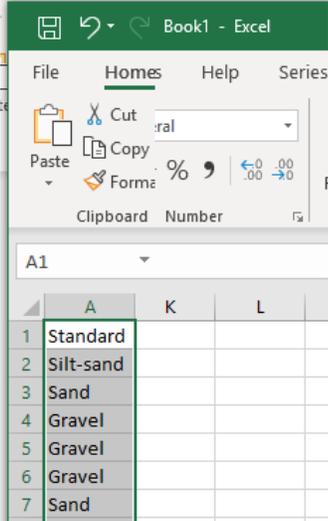
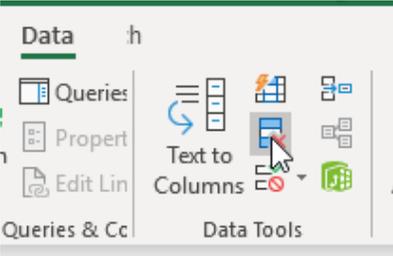
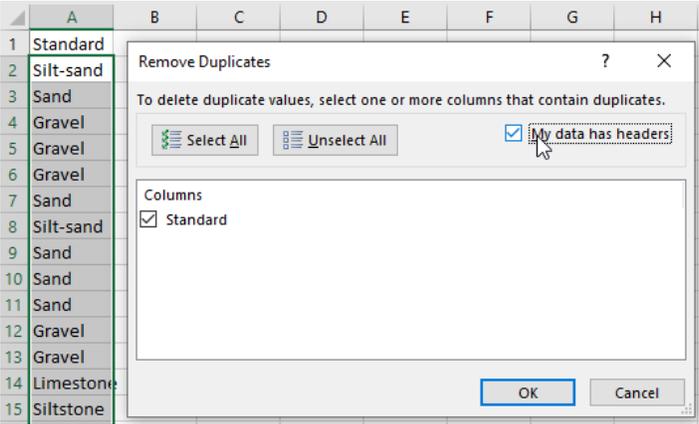


Every other row is shaded grey.

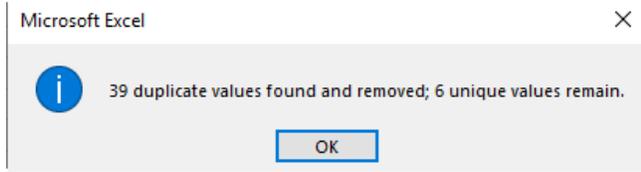
	B	C	D
3	Depth to Top, FEE	Lithology	Standard
4	0	Silty sandy (vf-vc) gravel (gran.-cob.) w/ minor clay	Silt-sand
5	28	Sandy (vf-vc) gravel (gran.-lg. peb.)	Sand
6	72	Gravelly (gran.-lg. peb.) sandy (vf-vc) silt with minor clay	Gravel
7	105	Gravelly (gran.-md. peb.) sandy (vf-vc) clayey silt	Gravel
8	139	Gravelly (gran.-md. peb.) sandy (vf-vc) silty clay	Gravel
9	156	Slightly gravelly (gran.-md. peb.) sandy (vf-vc) clayey silt	Sand
10	177	Silty sandy (vf-vc) gravel (gran.-md.) w/ minor clay; hematite & siderite	Silt-sand
11	194	Slightly gravelly (gran.-md. peb.) sandy (vf-vc) clayey silt; hematite & sid	Sand
12	209	Sandy (vf-vc) gravel (gran.-md. peb.) minor clay; hematite & sid	Sand

Determine the number of unique lithologic classes with the “Remove Duplicates” tool.

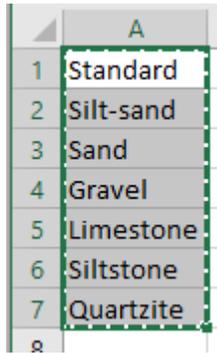
List of unique standard descriptions – 02_CHV_StandardizedLOG.xlsm

<p>Select range D3:D48, Copy range.</p>	
<p>Open a new workbook (Alt, F, N, L) Paste Special as values in new book.</p>	
<p>Select pasted range. Select Data tab on ribbon, Select “Remove Duplicates” tool, (Alt, A, M)</p>	
<p>“Remove Duplicates” form will appear. Check “My data has headers.” Click OK.</p>	

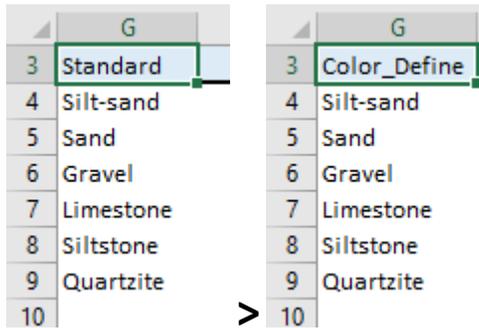
Information box will appear and report the number of unique values. 6 in this example.
Click OK and dismiss the box.



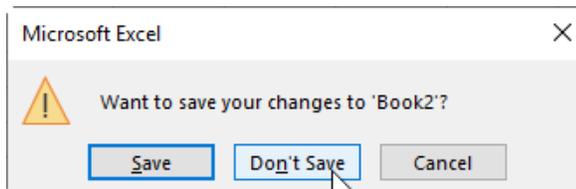
List of unique entries with header "Standard" in cell A1 are in the range A1:A7.
Copy range into memory.



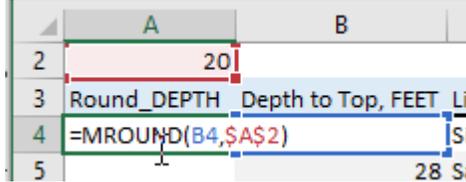
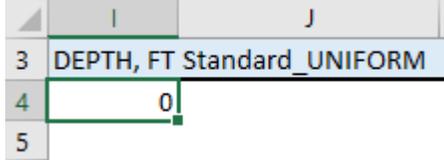
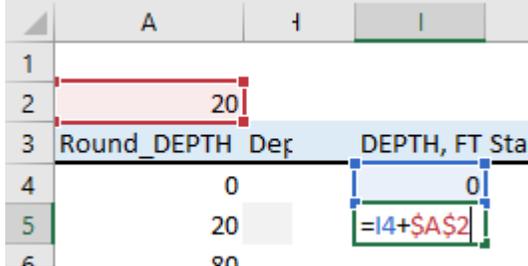
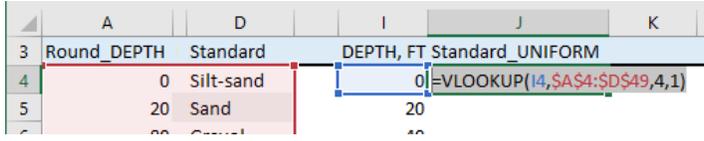
Return to workbook
02_CHV_StandardizedLOG.xlsm,
Paste Special as Values in cell G3.
Change header from "Standard" to "Color_Define" in cell G3.



Close the new workbook without saving.



02_CHV_StandardizedLOG.xlsm – Create log with uniform depths

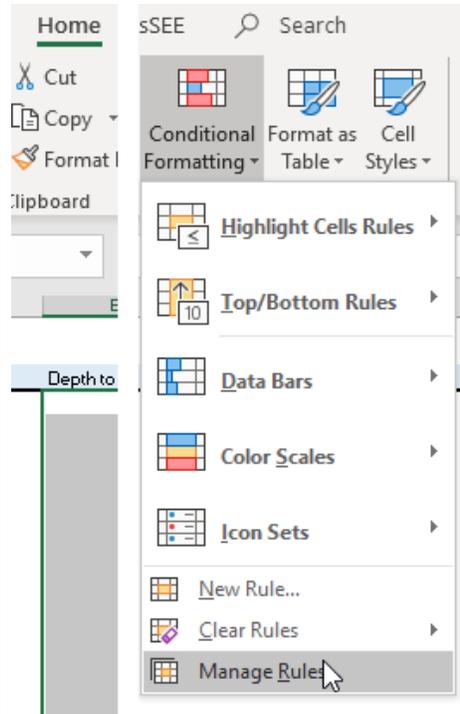
<p>Specify rounding increment of 20 in cell A2.</p> <p>Add rounded depths in cell A4 with, =MROUND(B4,\$A\$2)</p> <p>Copy equation to range A4:A49.</p>	
<p>Specify heading DEPTH, FT and Standard_UNIFORM in cells I3 and J3.</p> <p>Enter first depth of 0 in cell I4.</p>	
<p>Add depth increment equation, =I4+\$A\$2 to cell I5.</p> <p>Copy cell I5 to range I5:I68.</p>	
<p>Add equation to return standard lithology in cell J4, which is =VLOOKUP(I4,\$A\$4:\$D\$49,4,1)</p> <p>Copy cell J5 to range J5:J68.</p>	

Select range J5:J68.

Select Home tab on ribbon,

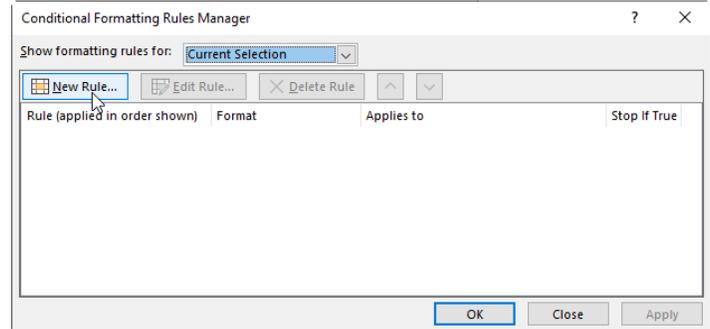
Select “Conditional Formatting”,

Select “Manage Rules”.



Conditional Formatting Rules Manager form will appear.

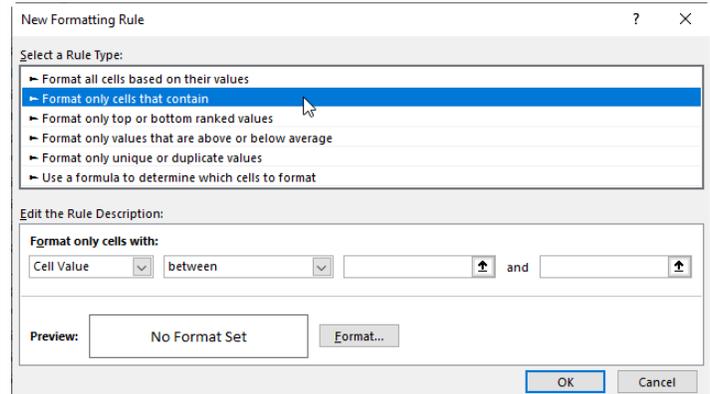
Click “New Rule...”



“New Formatting Rule” form will appear.

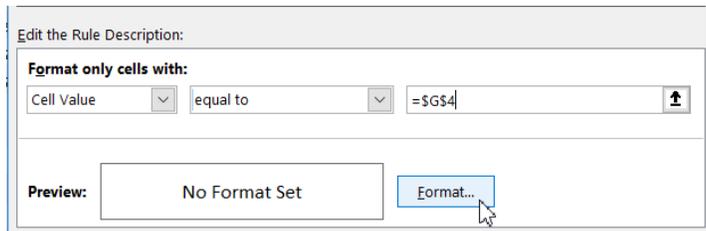
Select 2nd option,

“Format only cells that contain.”



Edit rule description to read,
Cell value equal to =\$G\$4.

Select Format... on “New Formatting Rule”
form to specify shading, font, etc. of
conditional format.

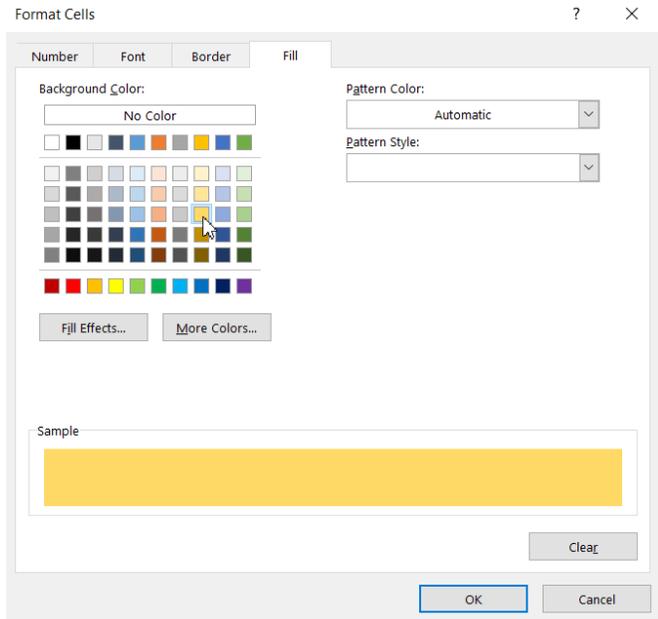


Format cells form will appear.

Select Fill tab.

Select a gold for gravel.

Select OK on forms until all forms are closed.



Shading has been specified for cells with
Gravel as defined in cell \$G\$4.

	I	J
	DEPTH, FT	Standard_UNIFORM
	0	Silt-sand
	20	Sand
	40	Sand
	60	Sand
	80	Gravel
	100	Gravel
	120	Gravel
	140	Gravel
	160	Sand
	180	Silt-sand

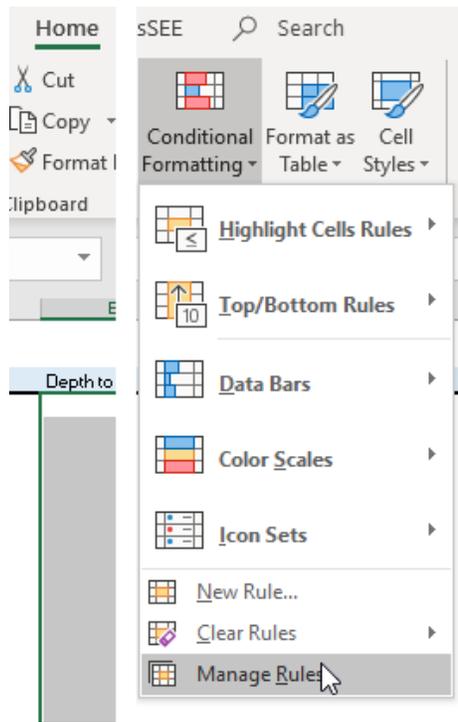
Repeat until a color is assigned to all 6 lithologic classes.

	G	H	I	J
3	Color_Define		DEPTH, FT	Standard_UNIFORM
4	Gravel		0	Silt-sand
5	Limestone		20	Sand
6	Quartzite		40	Sand
7	Sand		60	Sand
8	Silt-sand		80	Gravel
9	Siltstone		100	Gravel
10			120	Gravel
11			140	Gravel
12			160	Sand
13			180	Silt-sand
14			200	Sand
15			220	Sand
16			240	Gravel
17			260	Gravel
18			280	Gravel
19			300	Limestone
20			320	Limestone

Add formatting to improve appearance of depths.
Specify depth display increment of 100 in cell I1.

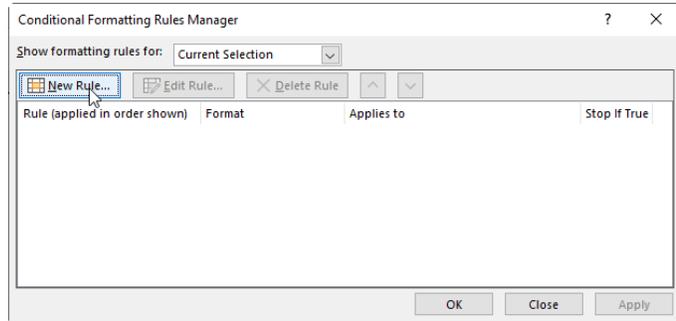
	H	I	J
1		100	
2			
3		DEPTH, FT	Standard_UNIFORM
4		0	Silt-sand
5		20	Sand

Select range I5:I68.
Select Home tab on ribbon,
Select "Conditional Formatting",
Select "Manage Rules".



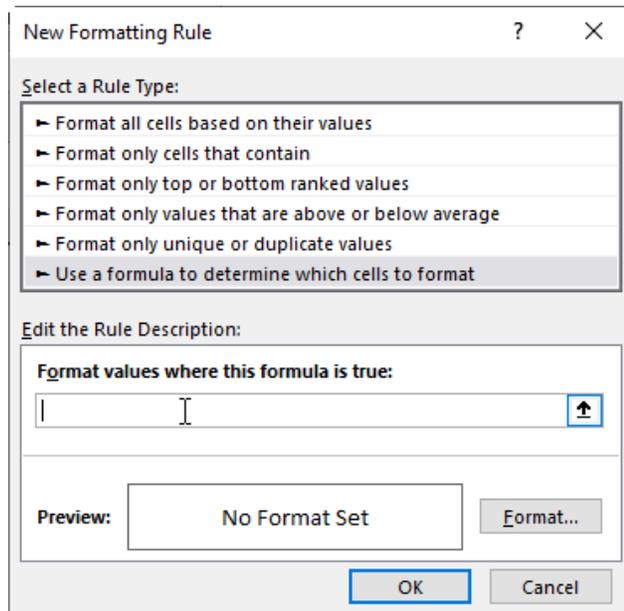
Conditional Formatting Rules Manager form will appear.

Click "New Rule..."



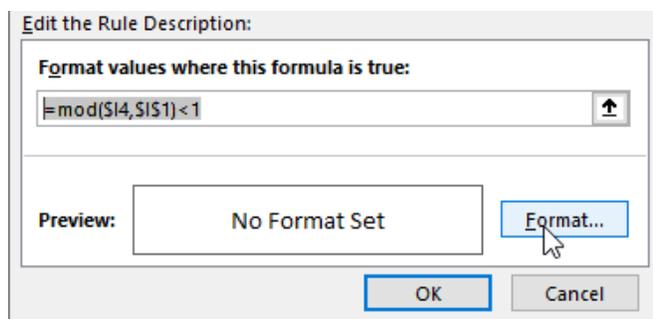
"New Formatting Rule" form will appear.

Select last option,
"Use a formula to determine which cells to format."

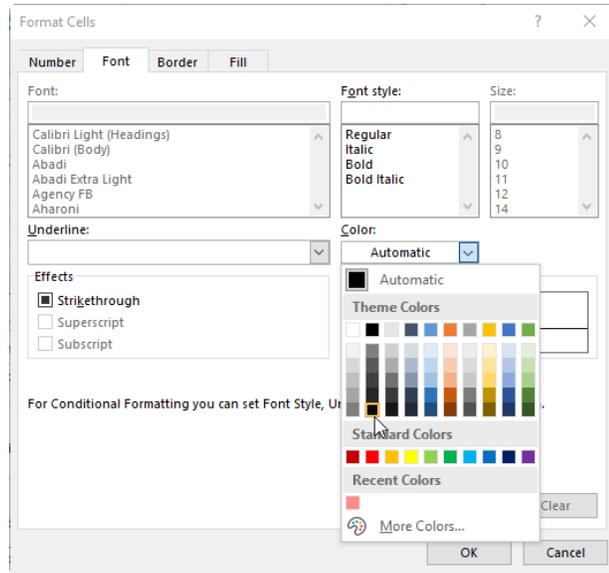


Edit rule description to read,
Cell value equal to =mod(\$I4,\$I\$1)<1.

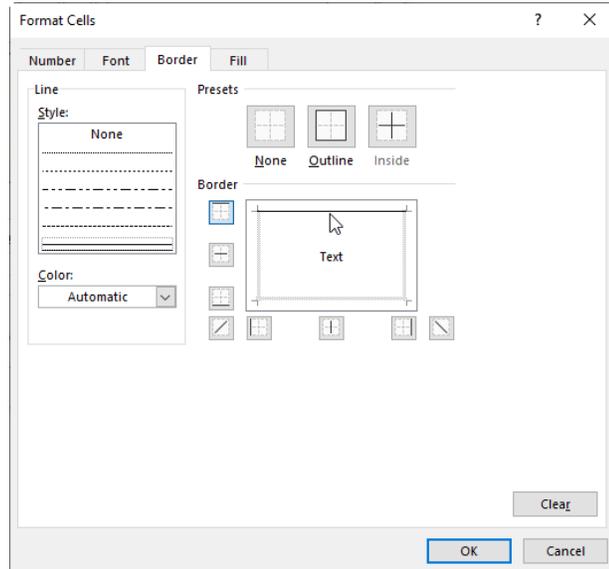
Select Format... on "New Formatting Rule"
form to specify shading, font, etc. of
conditional format.



Format cells form will appear.
 Select Font tab.
 Select a black font for the text.



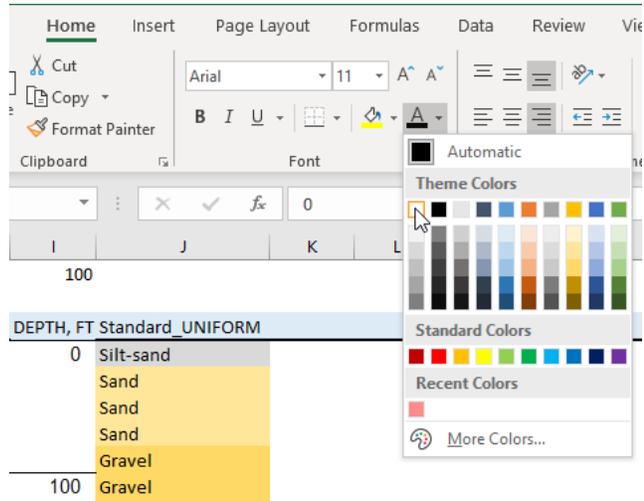
Select Border tab.
 Apply solid border to upper edge of
 conditionally formatted cells.
 Select OK on forms until all forms are closed.



Top of depth intervals are formatted
 conditionally.
 Range I5:I68 remains selected.

	H	I	J
1		100	
2			
3		DEPTH, FT Standard_UNIFORM	
4		0	Silt-sand
5		20	Sand
6		40	Sand
7		60	Sand
8		80	Gravel
9		100	Gravel

Select Home tab on ribbon,
 Select "Font Color",
 Specify a white font.



Bold all depths (**Ctrl+b**)
 Standardized log is final result.

3	DEPTH, FT Standard_UNIFORM	
4	0	Silt-sand
5		Sand
6		Sand
7		Sand
8		Gravel
9	100	Gravel
10		Gravel
11		Gravel
12		Sand
13		Silt-sand
14	200	Sand

Colors and depth scales are added with a VBA macro on the LithALL page.
 Colors are defined in the list of unique lithologies and applied programmatically to standardized log lithologies in column J.

Color_Define	DEPTH	Standard_UNIFORM
Gravel	0	Silt-sand
Limestone		Sand
Quartzite		Sand
Sand		Sand
Silt-sand		Gravel
Siltstone	100	Gravel
		Gravel
		Gravel
		Sand
		Silt-sand
	200	Sand
		Sand