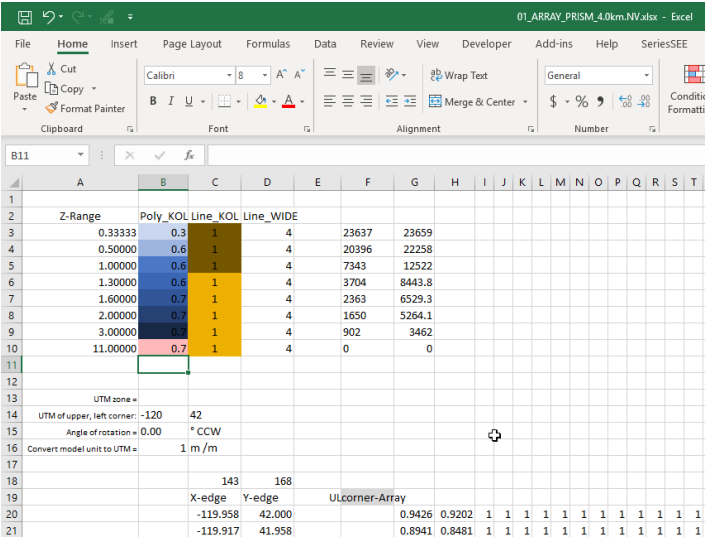
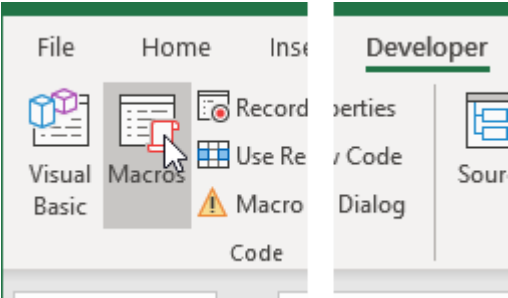


## 05\_IF-Histograms

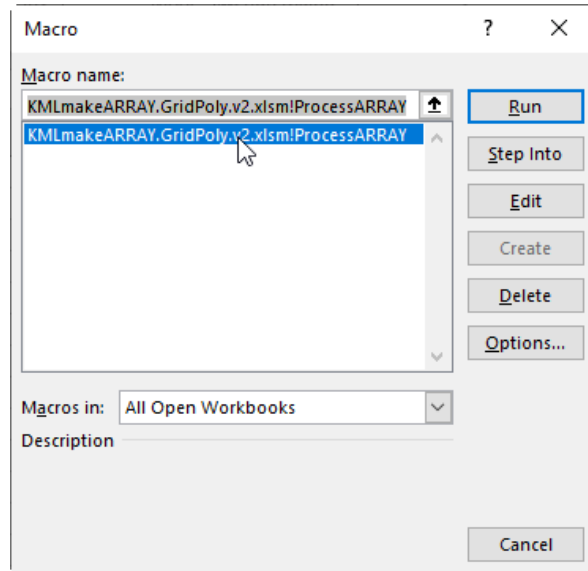
### Create Google Earth cover of [PRISM](#) – 01\_ARRAY\_PRISM\_4.0km.NV.xlsx

<p>Open files, KMLmakeARRAY.GridPoly.v2.xlsm and 01_ARRAY_PRISM_4.0km.NV.xlsx</p>	<p><b>*.xlsm</b> contains macros for rendering PRISM output as a KML file.</p>
<p>Activate file 01_ARRAY_PRISM_4.0km.NV.xlsx. Page PRISM_4km should be active.</p>	
<p>Select Developer tab on ribbon, Select “Macros” (<b>Alt+F8</b>)</p>	

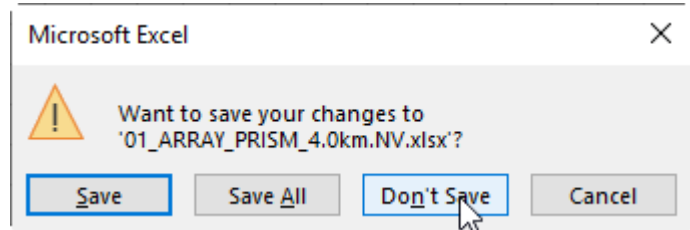
“Macro” form will appear.

Select macro,  
“KMLmakeARRAY.GridPoly.v2.xlsm!ProcessA  
RRAY”

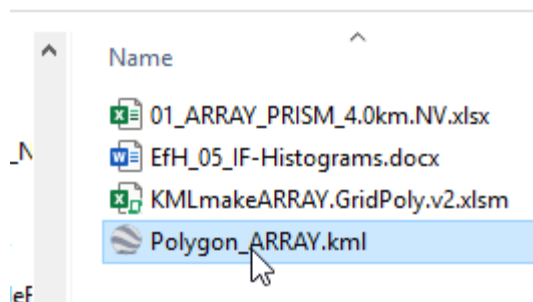
Double-click selection, or  
Click Run, or  
Hit Return/Enter.



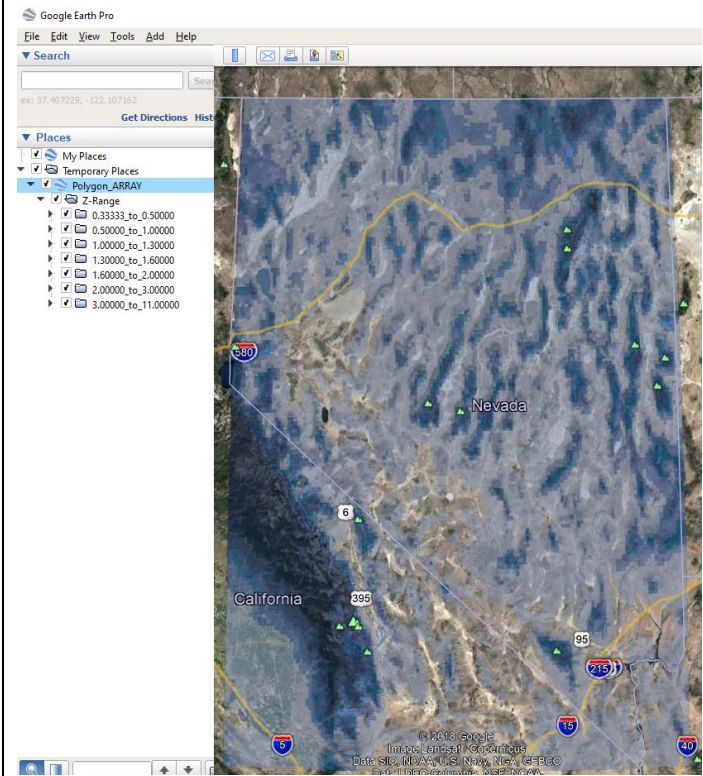
Exit Excel without saving anything.



Open Polygon\_ARRAY.kml with  
Google Earth.



Precipitation for Nevada displayed as shaded areas.



Dynamically subsample [PRISM](#) output with OFFSET and MATCH functions.  
Limit statistics to a focused study area.

## Subsample with OFFSET and MATCH – 01\_ARRAY\_PRISM\_4.0km.NV.xlsx

Open file,  
01\_ARRAY\_PRISM\_4.0km.NV.xlsx  
Select page SubAREA.

	A	B	C	D	E	F	G	H	I	J
1		width =					Longitude	Latitude		
2		Area =					-119.9	38		
3							Column	Row		
4	Precip, ft/yr	count	Label	acres	acre-ft/yr					
5										
6										
7										
8										
9										
10										
11										
12										

Start MATCH function in cell G4.  
Select G2 for lookup\_value.

	F	G	H	I	J	K	L	M	N	O	P
1		Longitude	Latitude								
2		-119.9	38								
3		Column	Row								
4		=MATCH(G2,									
5		MATCH(lookup_value, lookup_array, [match_type])									

Select page PRISM\_4km for lookup\_array.  
Select range PRISM\_4km!C20:C163.

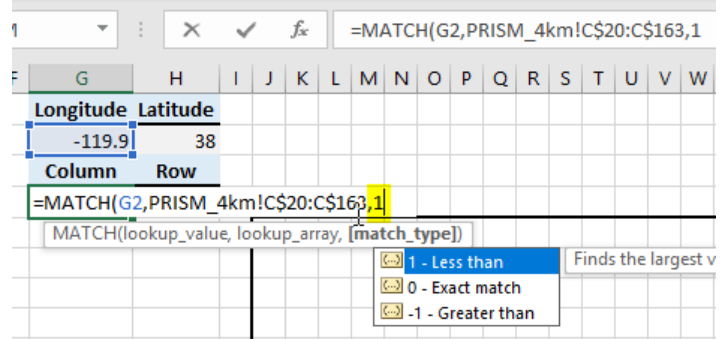
	A	B	C	D	E	F
19			X-edge	Y-edge		ULcorner-Ar
20			-119.958	42.000		
21			-119.917	41.958		
22			-119.875	41.917		
23			-119.792	41.833		
24			-119.750	41.792		
25			-119.708	41.750		
26			-119.667	41.708		
27			-119.625			
28						

Toggle reference (F4) so that columns are  
relative and rows are absolute.

=match(G2,PRISM\_4km!C\$20:C\$163

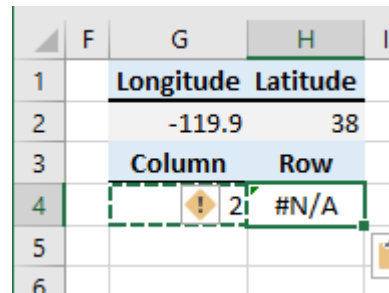
Specify match\_type as 1.

This is appropriate for an approximate match in an ascending sequence of values.



Copy cell G4,

Paste special, Formulas in cell H4.

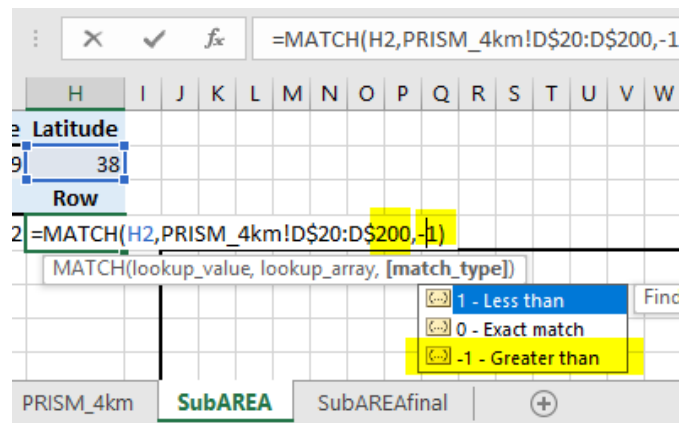


Type F2 to open cell H4 for editing.

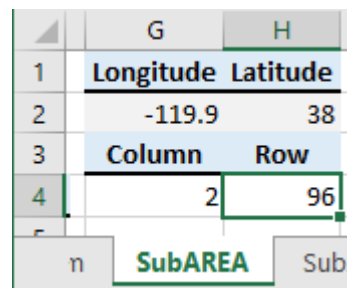
Extend range from 163 to 200.

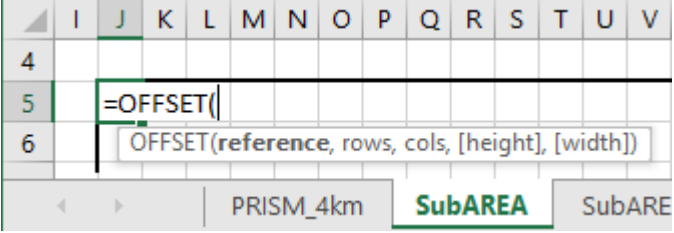
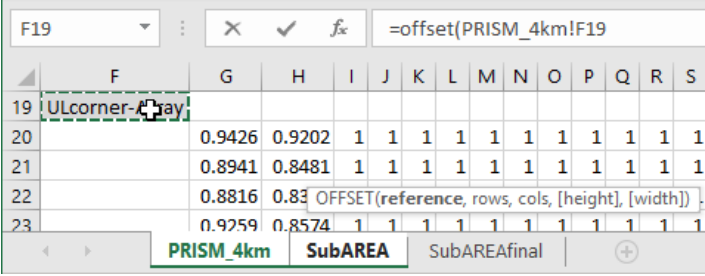
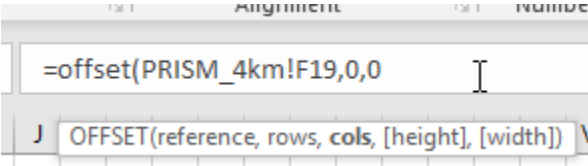
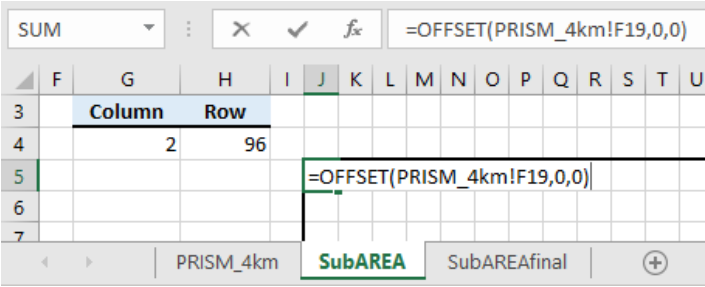
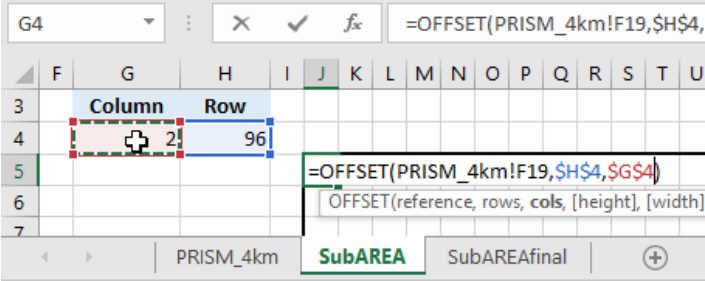
Reverse match\_type criteria by changing 1 to -1.

This is appropriate for an approximate match in a descending sequence of values.



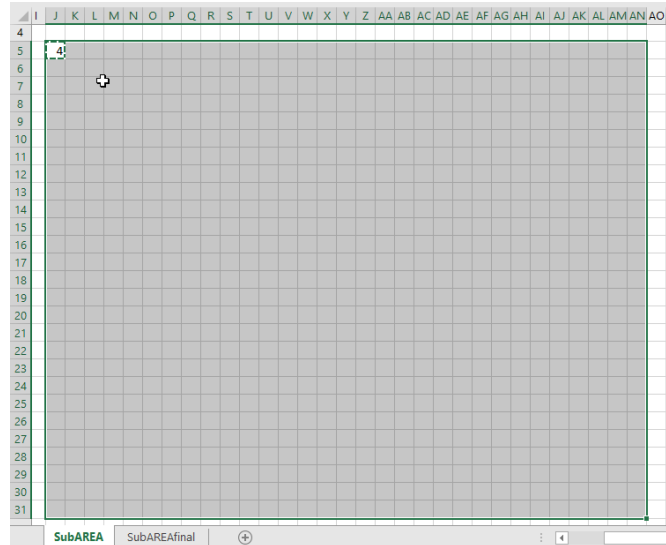
Row and column offsets are reported in cells G4 and H4.



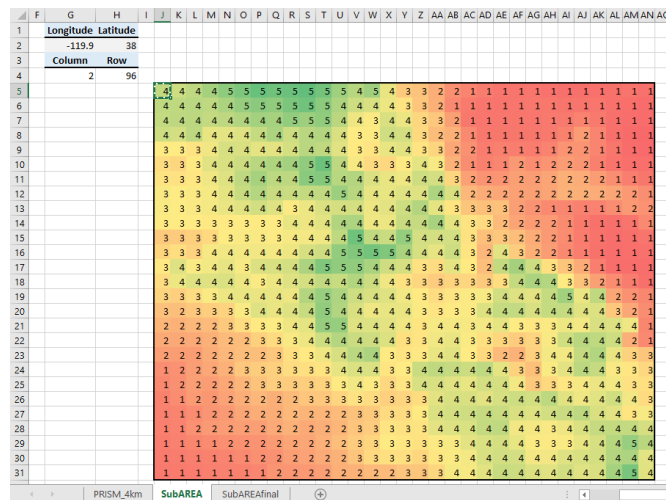
<p>Start OFFSET equation in cell SubAREA!J5.</p>	
<p>Select cell PRISM_4km!F19 on leftmost page PRISM_4km.</p>	
<p>Specify “,0,0)” to complete the offset equation. Type return/Enter.</p>	
<p>Type F2 to open cell J5 for editing.</p>	
<p>Replace rows with <b>\$H\$4</b>. Replace cols with <b>\$G\$4</b>. <b>NOTE:</b> <i>Toggle absolute/relative references with F4.</i></p>	

Copy equation in cell J5.

Paste special as formulas to range J5:AN31.



Apply first color scale from Conditional Formatting to the range J5:AN31.



Change latitude in cell H2 from

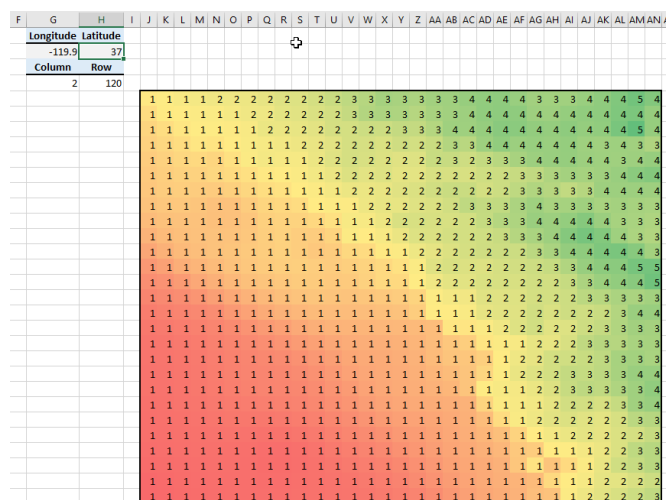
38° to 37°.

	G	H
1	Longitude	Latitude
2	-119.90°	37.00°

Array changes in response to revised row offset.

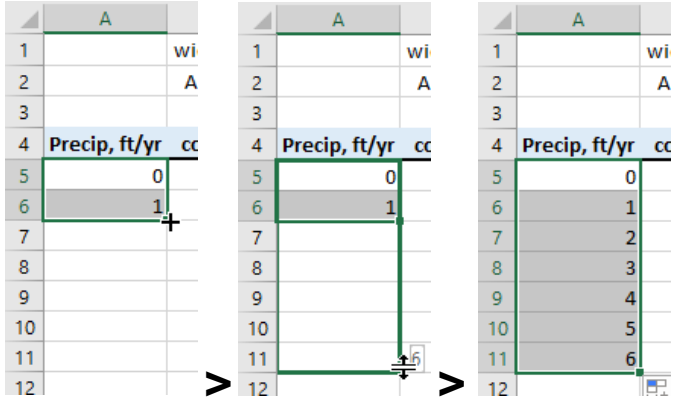
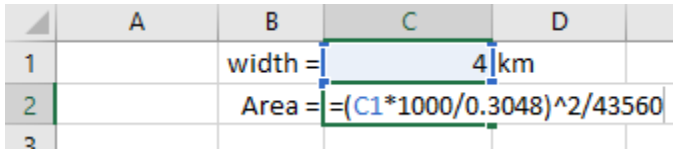
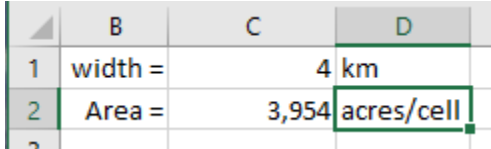
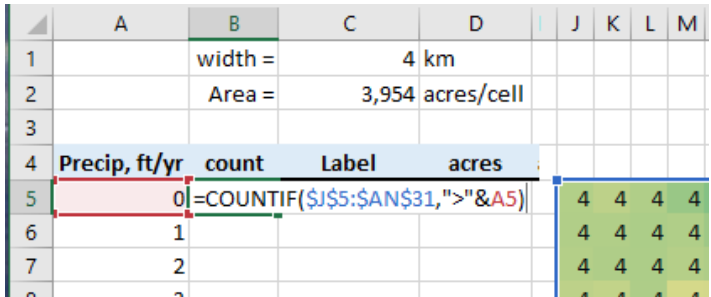
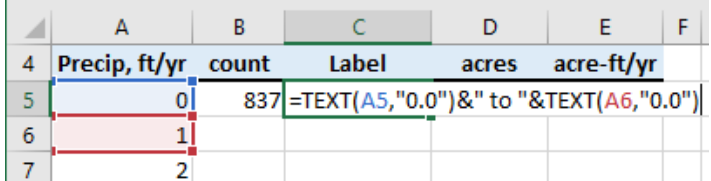
**NOTE:**

Number format is "0.00°" in range G2:H2.



Build histogram and sum cumulative precipitation volumes with COUNTIF and SUMIF functions.

## Apply COUNTIF and SUMIF – 01\_ARRAY\_PRISM\_4.0km.NV.xlsx

<p>Enter 0 and 1 in cells <b>A5</b> and <b>A6</b>.</p> <p>Select range <b>A5:A6</b>.</p> <p>Grab lower, right corner of selected range.</p> <p>Pull down to <b>A11</b> and release.</p> <p>1-ft bins of precipitation are defined in range <b>A5:A11</b>.</p>	
<p>Compute nominal area of PRISM cells in <b>C2</b>,  <math>= (C1 * 1000 / 0.3048)^2 / 43560</math></p> <p><b>NOTE:</b>  <i>Constant area is approximate.</i>  <i>Node spacing is 0.042°, so</i>  <i>Area = <math>\cos(\text{Latitude}) * 5303.8</math> acres/cell.</i></p>	
<p>Specify units in cell <b>D2</b>, " acres/cell"</p>	
<p>Count cells where annual precipitation exceeds value in column <b>A</b>.</p> <p>Enter <code>"=COUNTIF(\$J\$5:\$AN\$31,"&gt;"&amp;A5)"</code> in cell <b>B5</b>.</p> <p>IF condition defined with concatenated text, "&gt;"&amp;A5, which is "&gt;0".</p> <p>Range <b>\$J\$5:\$AN\$31</b> refers to dynamically sample array from the previous exercise.</p>	
<p>Define label for histogram.</p> <p>TEXT function controls format of labels.</p> <p>e.g., A break of 1.1023453 appears as "1.1" with the example format.</p>	



Copy equations in range **B5:C5**.

Paste to range **B5:C11**.

Delete equation in **C11**.

	A	B	C
4	Precip, ft/yr	count	Label
5		0	837 0.0 to 1.0
6		1	
7		2	
8		3	
9		4	
10		5	
11		6	

Compute acres in precipitation bins.  
Difference cell counts in the 0-1 ft/yr bin.

Add “=(B5-B6)\*\$C\$2” in cell **D5**.

	A	B	C	D	E
2		Area =	3,954	acres/cell	
3					
4	Precip, ft/yr	count	Label	acres	acre-
5	0	837	0.0 to 1.0	=(B5-B6)*\$C\$2	
6	1	789	1.0 to 2.0		
7	2	638	2.0 to 3.0		

Compute cumulative acre-feet of  
precipitation below a threshold rate.

Add “=SUMIF(\$J\$5:\$AN\$31,"<"&A5)\*\$C\$2”  
in cell **E5**.

IF condition defined with concatenated text,  
“<”&A5, which is “>0”.

	A	B	C	D	E	F	G	H	I
2		Area =	3,954	acres/cell			-119.90°	38.00°	
3							Column	Row	
4	Precip, ft/yr	count	Label	acres	acre-ft/yr		2	96	
5	0	837	0.0 to 1.0	189,777	=SUMIF(\$J\$5:\$AN\$31,"<"&A5)*\$C\$2				
6	1	789	1.0 to 2.0						

Copy equations in range **D5:E5**.

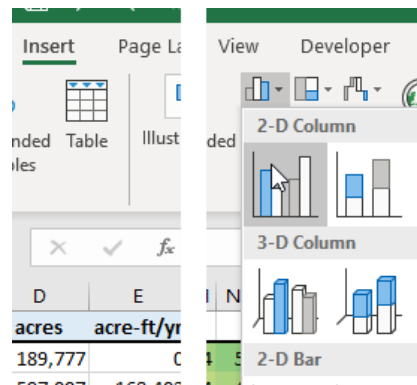
Paste to range **D5:E10**.

	C	D	E
4	Label	acres	acre-ft/yr
5	0.0 to 1.0	189,777	0
6	1.0 to 2.0		
7	2.0 to 3.0		
8	3.0 to 4.0		
9	4.0 to 5.0		
10	5.0 to 6.0		
11			

Select range **C4:E10**.

	C	D	E
4	Label	acres	acre-ft/yr
5	0.0 to 1.0	189,777	0
6	1.0 to 2.0	597,007	168,402
7	2.0 to 3.0	529,794	1,045,377
8	3.0 to 4.0	1,403,559	2,377,588
9	4.0 to 5.0	553,516	7,393,634
10	5.0 to 6.0	35,583	9,777,847
11			

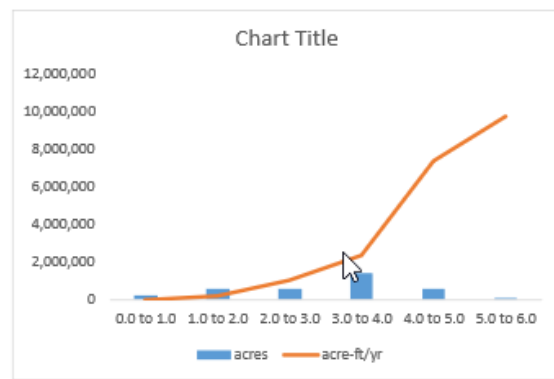
Insert a clustered column chart.



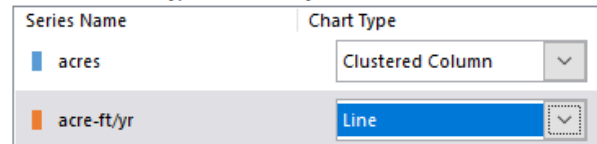
Select “Acre-ft/yr” series.

Change chart type to line.

### Custom Combination

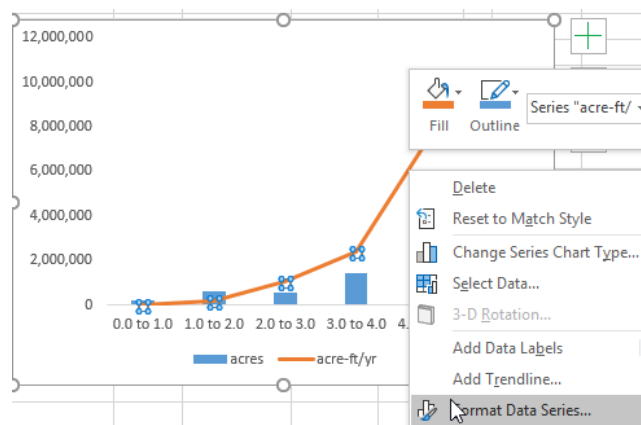


Choose the chart type and axis for your data series:



Select “Acre-ft/yr” series.

Right-click and select “Format Data Series...” option.



Assign "Acre-ft/yr" series to Secondary Axis.

## Format Data Series

### Series Options



### Series Options

Plot Series On

- ☐ Primary Axis
- ☒ Secondary Axis

Histogram of precipitation and cumulative precipitation chart after some formatting.

