

## KEY Week#5 GIS Table Problems 2017

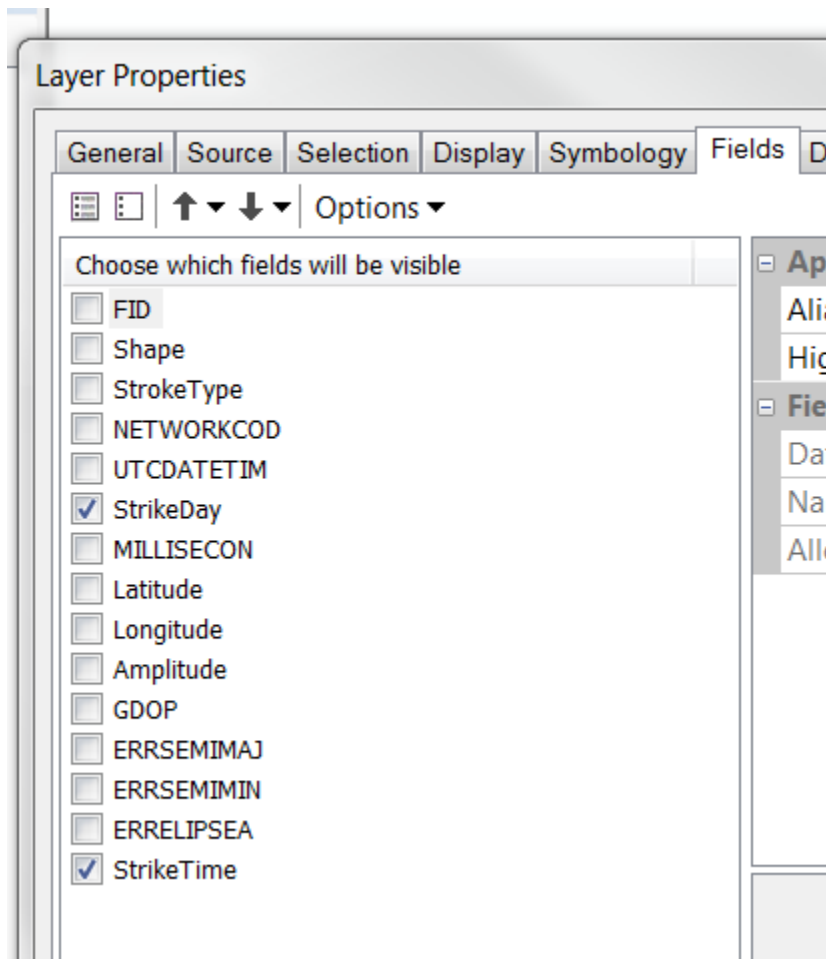
### Alaska Lightning Strikes

Download the June 1-14 2017 lightning strike locations for Alaska from

<http://fire.ak.blm.gov/predsvcs/maps.php>

**Create a bar chart showing the percentage of lightning strikes by hour of day.**

Turn off all fields except the field we are interested in.



LightningStrikes	
StrikeDay	StrikeTime
6/6/2017	2017/06/06 18:35
6/6/2017	2017/06/06 20:06
6/6/2017	2017/06/06 18:57
6/6/2017	2017/06/06 18:57

Add integer field for Hour and use Field Calculator DatePart function to extract hour from StrikeTime.

Table

LightningStrikes\_toa

StrikeTime	Hour
2016/06/06 19:05	19
2016/06/06 19:07	19
2016/06/06 19:14	19
2016/06/06 19:19	19
2016/06/06 19:35	19

Show Codeblock

Hour =

DatePart ("h", [StrikeTime])

Statistics:

Count:	9609
Minimum:	0
Maximum:	23

Check that hour ranges 1-23...

Use **Frequency** geoprocessing tool to create a table of lightning strikes by Hour

HR	FREQUENCY
0	62
1	120
2	42
3	25
4	16
5	4
6	1
7	7
8	2
9	5
10	15
11	32
12	173
13	515
14	845
15	1077
16	1126
17	1532
18	1149
19	1057
20	793
21	588
22	261
23	162

Add a Percent field and use Field Calculator to compute percent.

Field  
FREQUENCY

Statistics:

Count	24
Minimum	1
Maximum	1532
Sum	9609

PERCENT =

[FREQUENCY] / 9609 \* 100

FIELD CALCULATOR:

Check that percent adds up to 100%

Field  
PERCENT

Statistics:

Count	24
Minimum	0.010407
Maximum	15.943386
Sum	100

Export to Excel worksheet

Table To Excel

Input Table  
LightningStrikes\_By\_Hour

Output Excel File  
C:\nrm338\Lightning\_Frequency\_By\_HourofDay.xls

Create bar chart using Excel. **Or in arcmap**

Create Graph Wizard

Graph type: Vertical Bar

Layer/Table: LightningStrikes\_By\_Hour

Value field: Percent

X field (optional): Hour Value

X label field: <None>

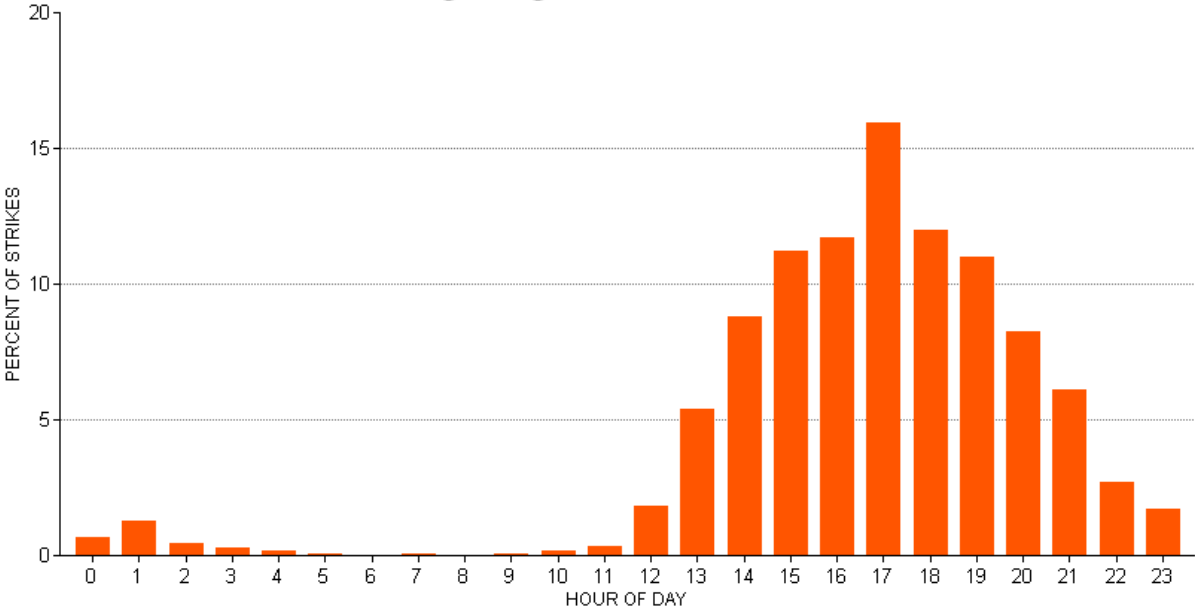
Vertical axis: Left

Horizontal axis: Bottom

Add to legend  Show labels (marks)

Color: Custom

Alaska Lightning Strikes June 1-14, 2017



## Ground Truthing Vegetation Polygons

The dbf table GroundTruth.contains the actual forest type from field sampling (Truth) and the polygon vegetation type estimated from aerial photography.

GroundTruth	
Truth	Polygon
Aspen	Aspen
Aspen	Aspen
Aspen	Aspen
Aspen	Birch
Aspen	Aspen
Aspen	Aspen
Aspen	Aspen
Balsam Poplar	Aspen
Balsam Poplar	Balsam Poplar
Balsam Poplar	Balsam Poplar
Balsam Poplar	Balsam Poplar

The table contains the polygon forest class and the actual ground truth forest class for a location inside each of the 263 polygons. Process the table to produce an “error matrix” with the number of correct classifications along the diagonal.

Polygon Class:	Truth Aspen	Truth Balsam_Poplar	Truth Birch	Truth Black_Spruce	Truth Mixed_Forest	Truth White_Spruce	Total Polygons	Accuracy
Aspen	6	3	2	0	0	0	11	55%
Balsam Poplar	0	58	0	0	0	0	58	100%
Birch	1	1	6	0	1	0	9	67%
Black Spruce	0	0	0	48	0	5	53	91%
Mixed Forest	0	0	0	0	55	0	55	100%
White Spruce	0	0	0	4	6	67	77	87%
Total Truth Points	7	62	8	52	62	72		
Class Accuracy	86%	94%	75%	92%	89%	93%		

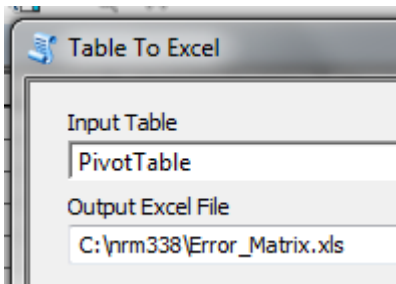
Use **Frequency** geoprocessing tool to determine count by polygon forest class and ground truth class.

Truth	Polygon	FREQUENCY
Aspen	Aspen	6
Aspen	Birch	1
Balsam Poplar	Aspen	3
Balsam Poplar	Balsam Poplar	58
Balsam Poplar	Birch	1
Birch	Aspen	2
Birch	Birch	6
Black Spruce	Black Spruce	48
Black Spruce	White Spruce	4
Mixed Forest	Birch	1
Mixed Forest	Mixed Forest	55
Mixed Forest	White Spruce	6
White Spruce	Black Spruce	5
White Spruce	White Spruce	67

Use **Pivot Table** geoprocessing tool to put Truth as columns, Polygon as rows, Frequency as value field.

Polygon	Aspen	Balsam Poplar	Birch	Black Spruce	Mixed Forest	White Spruce
Aspen	6	3	2	0	0	0
Balsam Poplar	0	58	0	0	0	0
Birch	1	1	6	0	1	0
Black Spruce	0	0	0	48	0	5
Mixed Forest	0	0	0	0	55	0
White Spruce	0	0	0	4	6	67

Export to Excel worksheet and compute percent accuracies in excell.

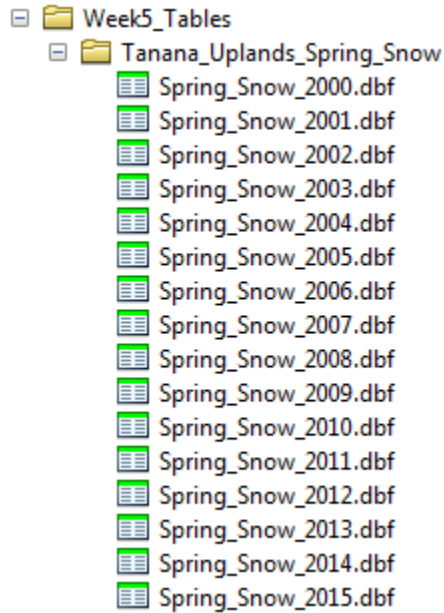


Polygon Class:	Truth Aspen	Truth Balsam_Poplar	Truth Birch	Truth Black_Spruce	Truth Mixed_Forest	Truth White_Spruce	Total Polygons	Accuracy
Aspen	6	3	2	0	0	0	11	55%
Balsam Poplar	0	58	0	0	0	0	58	100%
Birch	1	1	6	0	1	0	9	67%
Black Spruce	0	0	0	48	0	5	53	91%
Mixed Forest	0	0	0	0	55	0	55	100%
White Spruce	0	0	0	4	6	67	77	87%
Total Truth Points	7	62	8	52	62	72		
Class Accuracy	86%	94%	75%	92%	89%	93%		

Polygon	Totals	Polygon Accuracy	Truth Aspen	Truth Balsam_Poplar	Truth Birch	Truth Black_Spruce	Truth Mixed_Forest	Truth White_Spruce
Aspen	11	54.5%	6	3	2	0	0	0
Balsam Poplar	58	100.0%	0	58	0	0	0	0
Birch	9	66.7%	1	1	6	0	1	0
Black Spruce	53	90.6%	0	0	0	48	0	5
Mixed Forest	55	100.0%	0	0	0	0	55	0
White Spruce	77	87.0%	0	0	0	4	6	67
Ground Truth Totals			7	62	8	52	62	72
Ground Truth Accuracy			85.7%	93.5%	75.0%	92.3%	88.7%	93.1%

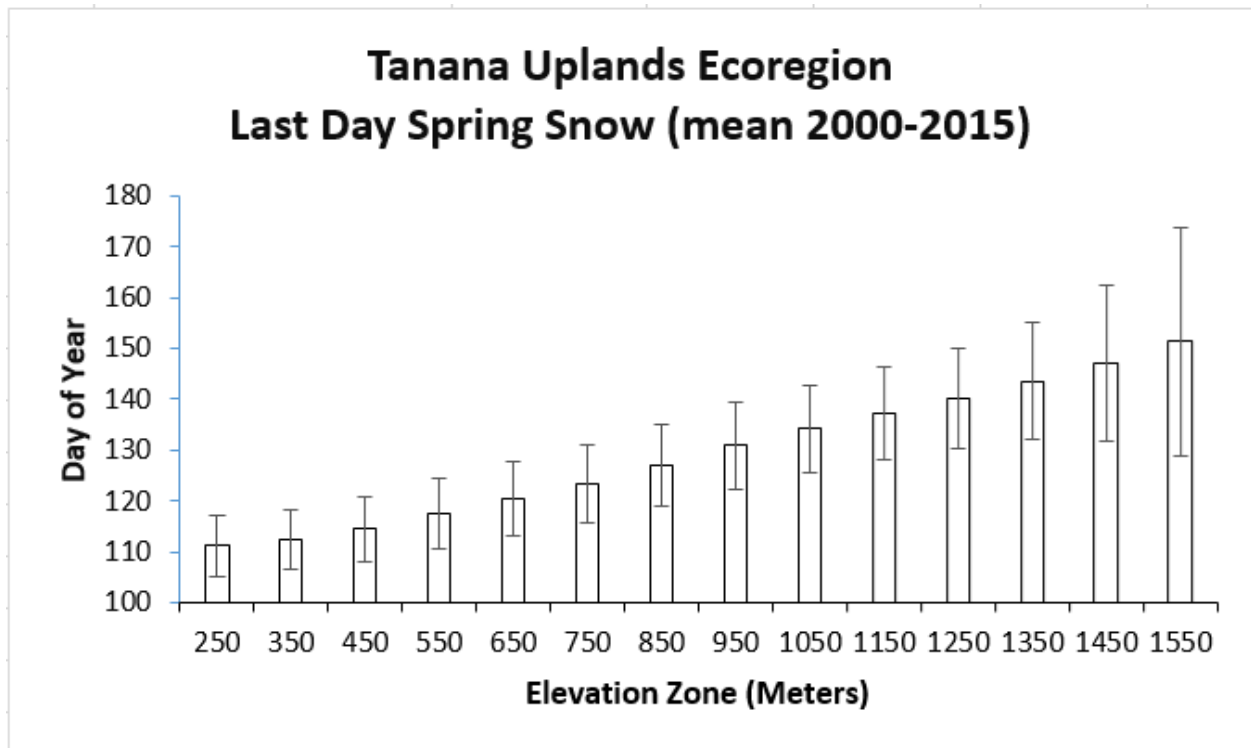
## Snow Tables

The folder contains tables of day of last spring snow for each elevation zone within the Tanana Uplands ecoregion.



ElevationZones		
OID	Value	Elev_Meter
0	1	150
1	2	250
2	3	350
3	4	450
4	5	550
5	6	650

For each elevation zone with minimum count of at least 1000, develop a chart of 2000-2015 mean and standard deviation of day of last spring snow by elevation zone.



Spring\_Snow\_2000

OID	Value	COUNT	AREA	MEAN	Year
0	1	406	101500000	117.541872	2000
1	2	2804	701000000	116.360556	2000
2	3	7397	1849250000	115.975395	2000
3	4	13865	3466250000	119.371006	2000
4	5	21897	5474250000	123.401653	2000

Spring\_Snow\_2015

OID	Value	COUNT	AREA	MEAN	Year
0	1	406	101500000	107.926108	2015
1	2	2804	701000000	109.215407	2015
2	3	7397	1849250000	110.18859	2015
3	4	13865	3466250000	111.97079	2015
4	5	21897	5474250000	114.929305	2015

Use **Merge** geoprocessing tool to merge together the 16 tables.

Spring\_Snow\_2000\_2015

OBJECTID *	Value	COUNT	MEAN	Year
1	1	406	117.541872	2000
2	2	2804	116.360556	2000
3	3	7397	115.975395	2000
4	4	13865	119.371006	2000
5	5	21897	123.401653	2000
6	6	32118	127.212155	2000
7	7	39602	131.042523	2000
8	8	36770	137.019391	2000

Statistics of Spring\_Snow\_2000\_2015

Field: Year

Statistics:

Count: 288  
Minimum: 2000  
Maximum: 2015

Definition Query Count > 1000, then use Summary Statistics geoprocessing tool to compute mean and standard deviation

Table Properties

General Source Display

Definition Query:

COUNT >= 1000

Field

COUNT

Statistics:

Count: 224  
Minimum: 1205  
Maximum: 39602



Value	FREQUENCY	MEAN_MEAN	STD_MEAN
2	16	111.260966	5.965444
3	16	112.467883	5.956821
4	16	114.575162	6.394289
5	16	117.62755	6.89906
6	16	120.446356	7.335561
7	16	123.288107	7.680281
8	16	126.955285	8.081585
9	16	130.88579	8.399064
10	16	134.271793	8.630499
11	16	137.288818	9.046983
12	16	140.180641	9.753834
13	16	143.557938	11.539319
14	16	147.185618	15.390395
15	16	151.452905	22.496184

Use **Join Field** geoprocessing tool to join elevation zone to table.

Spring\_Snow\_Stats

Value	FREQUENCY	MEAN_MEAN	STD_MEAN
2	16	111.260966	5.965444
3	16	112.467883	5.956821
4	16	114.575162	6.394289
5	16	117.62755	6.89906
6	16	120.446356	7.335561
7	16	123.288107	7.680281
8	16	126.955285	8.081585
9	16	130.88579	8.399064
10	16	134.271793	8.630499
11	16	137.288818	9.046983
12	16	140.180641	9.753834
13	16	143.557938	11.539319
14	16	147.185618	15.390395
15	16	151.452905	22.496184

0 (0 out of 14 Selected)

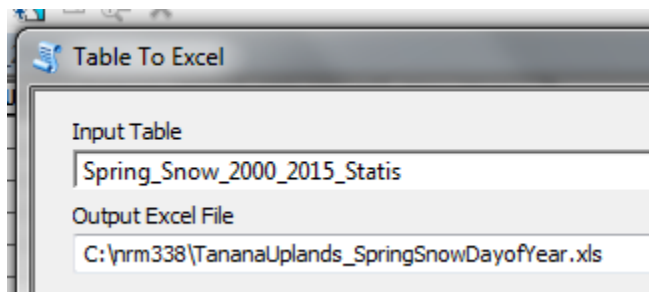
Spring\_Snow\_2000\_Merge1 Spring\_Snow\_Stats

ElevationZones

Value	Elev_Meter
1	150
2	250
3	350
4	450
5	550
6	650

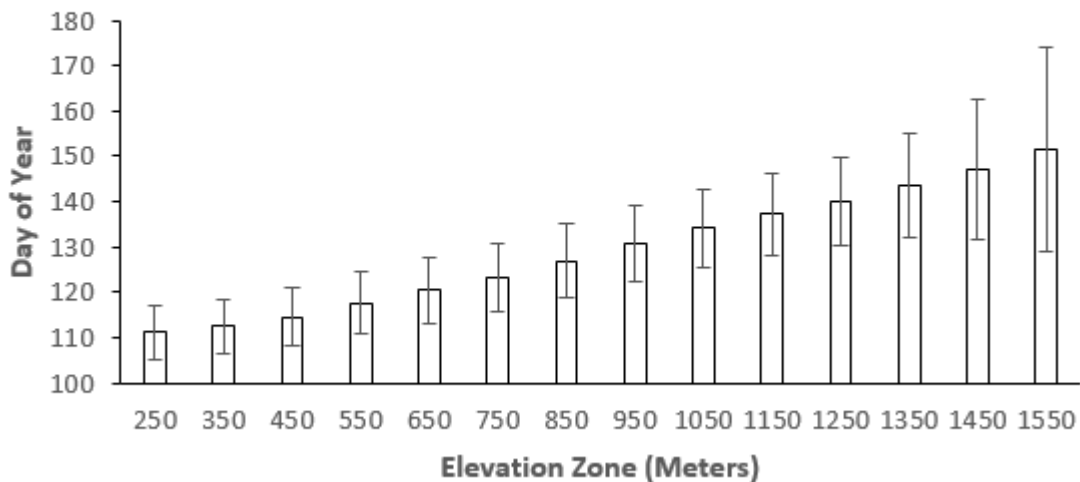
Value	FREQUENCY	MEAN_MEAN	STD_MEAN	Elev_Meter
2	16	111.260966	5.965444	250
3	16	112.467883	5.956821	350
4	16	114.575162	6.394289	450
5	16	117.62755	6.89906	550
6	16	120.446356	7.335561	650
7	16	123.288107	7.680281	750
8	16	126.955285	8.081585	850
9	16	130.88579	8.399064	950
10	16	134.271793	8.630499	1050
11	16	137.288818	9.046983	1150
12	16	140.180641	9.753834	1250
13	16	143.557938	11.539319	1350
14	16	147.185618	15.390395	1450
15	16	151.452905	22.496184	1550

Export to excel worksheet.

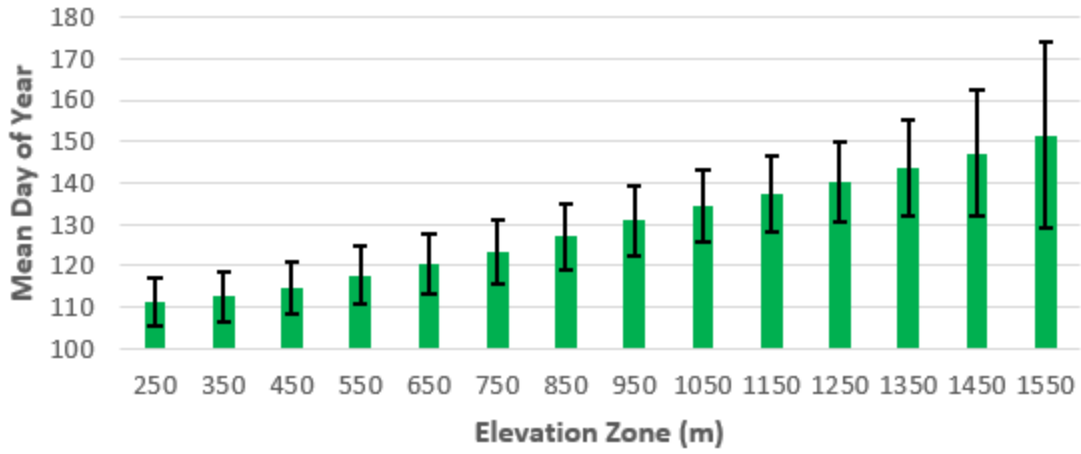


Create bar chart using excel:

**Tanana Uplands Ecoregion  
2000-2015 Mean Day of Last Spring Snow**

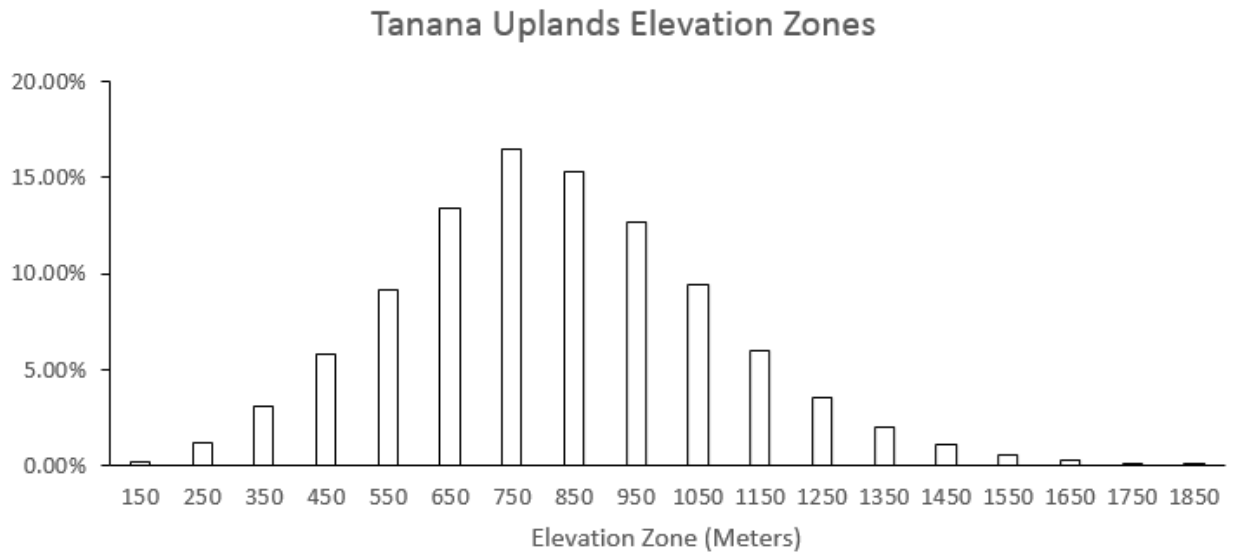


**Tanana Uplands Ecoregion  
2000-2015 Mean Day of Last Spring Snow  
By Elevation Zone**



## Percent Area

Develop a chart of 2000-2015 mean count expressed in percent by elevation zone.



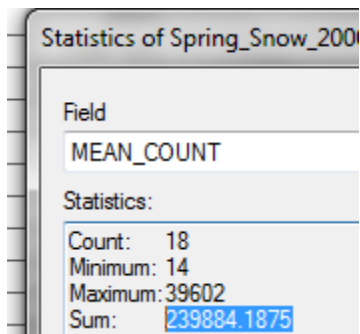
Clear definition query on merged table

Value	COUNT	MEAN	Year
1	406	117.541872	2000
2	2804	116.360556	2000
3	7397	115.975395	2000
4	13868	116.371006	2000

Use **Summary Statistics** geoprocessing tool to get mean count by elevation zone

Value	FREQUENCY	MEAN_COUNT
1	16	406
2	16	2804
3	16	7398.125
4	16	13868.4375
5	16	21899.625
6	16	32118

Add a field and compute percent:



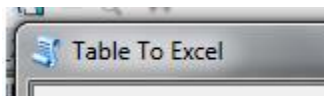
Percent =  

$$[\text{MEAN\_COUNT}] / 239884.1875 * 100$$

Use **Join Field** geoprocessing tool to join the elevation zone to your table.

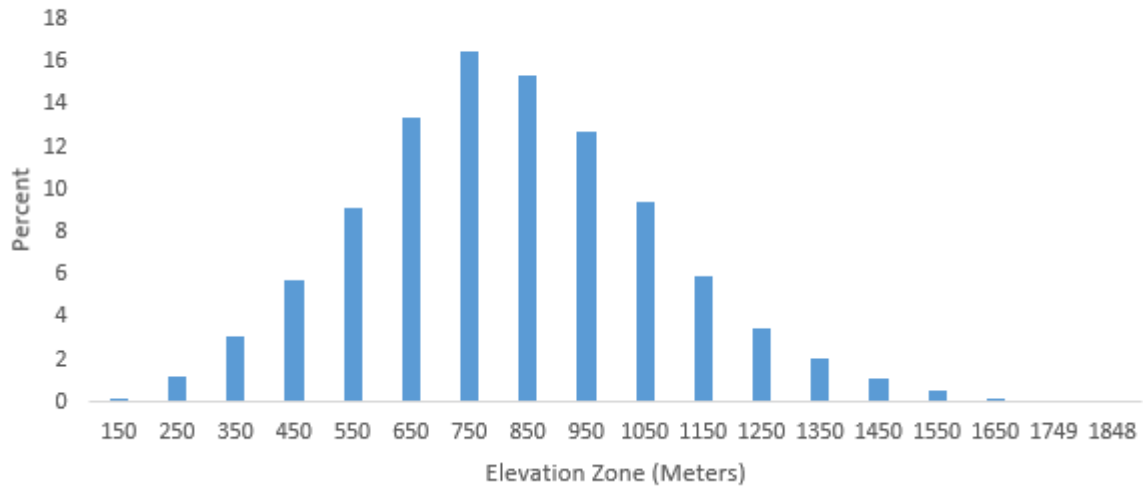
Value	FREQUENCY	MEAN_COUNT	Percent	Elev_Meter
1	16	406	0.169248	150
2	16	2804	1.168897	250
3	16	7398.125	3.08404	350
4	16	13868.4375	5.781305	450
5	16	21899.625	9.129249	550
6	16	32118	13.388961	650
7	16	39602	16.5088	750
8	16	36770	15.32823	850
9	16	30461	12.698211	950

Export to excel worksheet.



Create bar chart using excel:

Tanana Uplands Ecoregion Elevation Zones Percent by Count



Or use Arcmap to create bar chart

