



# Does elevation affect snowfall?



Main Street Intermediate School  
Norwalk, Ohio, USA

N41.24 latitude  
W-082.61 longitude  
February 2020

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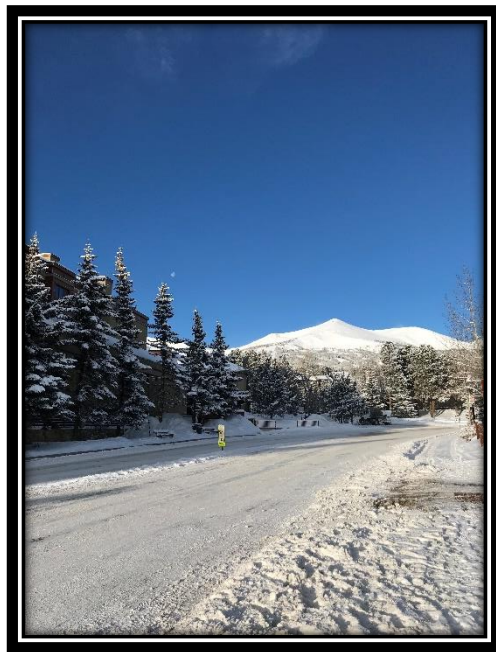
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## Photo Credits:

- Student skiing photos taken in a location between latitudes of 39-42 degrees north of the equator – Breckenridge, Colorado.  
(Photo taken with the Apple Iphone 7)
- Scenery photos were taken at Breckenridge, Colorado  
(Photo taken with the Apple Iphone 7)

# Abstract

My research is about different cities in the United States and my school Main Street all within a latitude of 39-42 degrees north of the equator. I used the cities Breckenridge, Sandusky, Chicago, Fort Wayne, Park City, Pittsburgh, and my school Main Street. I got snowfall data for the cities and my school (in inches) and compared their elevation and amount of snow they got for the year of 2018, to see if elevation does affect snowfall. According to my data it shows that elevation does have an effect on snowfall.



This research project was completed by sixth grade student at Main Street Intermediate School in Norwalk, Ohio, USA.

## Student

Kayli Bergman

# Introduction

The purpose of this project is to find out if elevation effects snowfall. The importance of this project is knowing if elevation does affect snowfall. According to my data it shows that higher elevations get more snowfall, so it would be a good idea to open a ski resort in a community with a high elevation. Another example of community relevance is that a community with a high elevation would be reasonable to work for a snow plow company because there will be more snowfall. An example of a job in a community that would want a lower elevation would be an airport worker because they don't want snow for an airplane to take off. Those are a few examples of community relevance with jobs that need and don't need snow. One of my references to help me find my data is GLOBE. Another reference I used is [www.onthesnow.com](http://www.onthesnow.com). I also used Current Results to help me find my data.

## Research Questions

I want to find out more about how snowfall data is affected by elevation. I thought it would be interesting to compare data from different cities in the United States during the year of 2018. Last year in fifth grade I took snowfall data for the year of 2018.

## Hypothesis

I think that places with a higher elevation will get more snowfall. I think this way because as you get higher in elevation the atmosphere gets thinner. When you get closer to the atmosphere it gets colder. When you go higher in elevation the air pressure decreases. Even though warm air rises, it carries more moisture than cold air, and as I said before, the higher you go in elevation the colder it gets. So when the warm air gets higher in elevation it freezes and snows.

## Materials

- Computer / Chrome book
- GLOBE snowfall data sheet
- [www.GLOBE.gov](http://www.GLOBE.gov) to enter and find my school's data
- Notebook
- Construction Paper
- GLOBE project from last year.

## Research Methods

- Learn about surface temperature and how to collect data using the GLOBE protocol. Last year I took surface temperature measurements during the year of 2018.
- Last year I entered data into [www.GLOBE.gov](http://www.GLOBE.gov) for my school.
- Use [www.GLOBE.gov](http://www.GLOBE.gov) to find snowfall data and elevation for my school for the year of 2018.
- Use the visualization tool on [www.GLOBE.gov](http://www.GLOBE.gov) to find snowfall data for Main Street School to put on my poster to share with others.
- Find snowfall data for the other cities in the U.S I chose.
- Display everything I need to put on my poster to share with others.

## GLOBE school, cities, and elevations used in this project:

- Park City - Utah, USA, 7,000 ft
- Breckenridge - Colorado, USA, 9,600 ft
- Chicago - Illinois, USA, 597 ft
- Fort Wayne - Indiana, USA, 810 ft
- Sandusky - Ohio, USA, 597 ft
- Main Street Intermediate school - Ohio, USA, 731 ft
- Pittsburgh - Pennsylvania, USA, 1,370 ft



# Elevation and Snowfall Data Locations

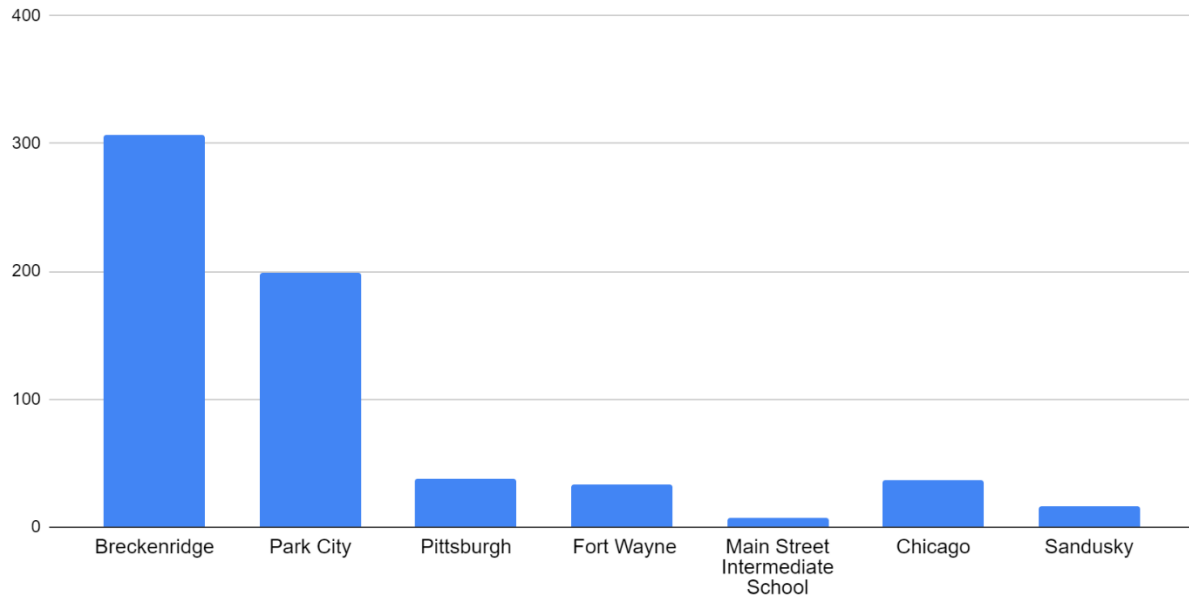
Map Source: Google Maps





# Elevation and Snowfall

(Graph produced using Google Sheets)



# Snowfall Data I entered into GLOBE.gov

Data for Main Street Intermediate School was submitted to the GLOBE website during the winter months of 2018.

	School site		location		elevation	Date/time UT	surf. Temp		snowfall mm
102	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/27/2018 19:15	-3.6	snow	32.8
103	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/28/2018 13:36	-3.4	snow	14.4
104	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/28/2018 18:05	-3.8	snow	30
105	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/28/2018 19:00	-2.8	wet	
106	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/28/2018 20:15	-2.8	snow	11.7
107	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/29/2018 16:18	-2	snow	26.7
108	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/29/2018 18:15	1.3	snow	18.3
109	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/29/2018 19:51	-0.5		
110	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/30/2018 13:30	-2	snow	23.9
111	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/30/2018 14:34	3	wet	
112	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/30/2018 18:04	3.6	wet	
113	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/30/2018 18:35	3.2		
114	Main Street	Grassy playground area	41.2439	-82.6114	296.4	11/30/2018 19:20	3.3		
115	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/3/2018 13:30	2.6	wet	
116	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/3/2018 16:55	6.1	wet	
117	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/3/2018 17:55	6.1	wet	
118	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/3/2018 19:01	4.3	wet	
119	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/4/2018 14:20	0.5	snow	5
120	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/4/2018 15:25	0	wet	
121	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/4/2018 18:55	-0.5	wet	
122	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/4/2018 19:01	3.7	dry	
123	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/5/2018 14:20	-2.2	dry	
124	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/5/2018 16:00	1.4	dry	
125	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/5/2018 16:30	1.8		
126	Main Street	Grassy playground area	41.2439	-82.6114	296.4	12/5/2018 18:00	4.2	snow	5

# Conclusion

In this project I learned that elevation does affect snowfall. For the most part my hypothesis was correct, but the cities that are closer to a lake got more snow due to lake effect. Overall my data does show that elevation does affect snowfall. For example Breckenridge has the highest elevation (9,600 feet) and got the most snowfall (307 inches). An example of lake effect would be Sandusky and my school Main Street. Main Street has a higher elevation (731 feet) than Sandusky (597 feet), but Sandusky got more snow with 16.2 inches than Main Street which is 7 inches. This is because the wind blows off the lake in the right direction and causes lake effect. If you look in my data you will also see that Sandusky and Chicago both have the same elevation (597 feet) and have around the same snowfall (Sandusky has 16.2 inches and Chicago has 36.7 inches), but Chicago has a little bit more snow because the wind blew off the lake on a different angle, and caused a bit more lake effect. An example that shows that lake affect and elevation both play a role in snowfall is Fort Wayne and Chicago. Fort Wayne has a higher elevation (810 feet) than Chicago (597 feet), but Fort Wayne got 3.2 inches of snow less than Chicago. This shows that the lake does have an effect on Chicago, but elevation does have an effect because Fort Wayne is not by a lake and only has 3.2 inches less than Chicago. This data proves that elevation and lake effect depends on the amount of snow in a certain area.

In my research I also found that in some years the amount of snowfall varies in the same location. I did find out that Breckenridge with an elevation of 9,600 feet, consistently got over 300 inches of snow every year. So elevation does have an effect on the amount of snowfall.

In conclusion I have learned that elevation does have an effect on snowfall, but I have also learned that the lake also has an effect on snowfall.

## Questions For Further Study

- Does elevation affect the amount of lake effect snow?
- Does ice cover affect snowfall?

## Bibliography/Citations

- I used four references to help me complete my project. The four references that I used to help me are GLOBE.gov, currentresults.com, onthesnow.com, and last year's fifth grade GLOBE research project.
- I used GLOBE.gov materials to help me find my data. The materials I used to help me find my data from GLOBE is the amount of snow and the elevation of Main Street School for the year of 2018.
- I also used currentresults.com to help me find my data. The data I used from this website is the amount of snowfall that some of the cities got for the year of 2018
- Another website I used to help me find my data is onthesnow.com. I also used this website to help me find snowfall data for other cities I used.
- The last reference I used to help me complete this project was the fifth grade GLOBE project I did last year "How Does Elevation Affect Surface Temperature".

