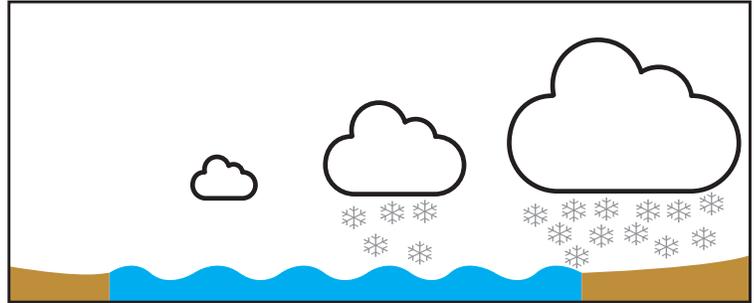


ACTIVITY 3 THE LAKE EFFECT

Lake-effect snow is a very special type of weather system that causes intense blizzards in concentrated geographical areas. As we see in **The Search for Snow**, this phenomenon is very common in the Great Lakes region of North America.

PART 1: WHAT IS LAKE-EFFECT SNOW?

When cold powerful winds move across the large, relatively warm waters of one of the Great Lakes, they pick up a lot of moisture and heat. Clouds form. As the air continues to move across the water, the clouds grow and the number of snowflakes (dendrites) increases. When snowflakes grow large enough, gravity pulls them out of the clouds, producing a small area of snow that looks like a belt around the edge of the lake. The resulting storm can dump as much as 2-3 inches of snow per hour, with zero visibility and drifts as high as six feet.



Draw arrows to label the direction of the wind, the evaporation of water vapor from the lake, and the location of the central impact of the blizzard in the diagram above showing how lake-effect snow is generated.

PART 2: MEASURING THE EFFECT

Lake-effect snow makes winters challenging for the cities around Lake Erie. Note the locations of Buffalo, NY, Cleveland, OH, and Toledo, OH on this map. Then tally the snowfall amount for each city as shown in the chart below. Use the map and chart to answer these questions.



- Which city gets the most annual snowfall from October through January? _____
The least? _____
- During which two months do these two cities experience the biggest difference in snowfall?
_____ and _____
- For each of those two months, what is the percentage difference?
 - In _____(month), _____(city) gets ___% more snow than _____(city).
 - In _____(month), _____(city) gets ___% more snow than _____(city).
- For the period from October through January, what is the annual difference?
On average, _____(city) gets ___% more snow than _____(city).
- These two cities are both part of Lake Erie's lake-effect snow belt. Why do they get such different amounts of snow? (Hint: Think about wind direction and distance.)

		Toledo, OH	Cleveland, OH	Buffalo, NY
October	Snowfall in inches	0.0	0.0	0.0
November	Snowfall in inches	1.6	3.6	6.2
December	Snowfall in inches	5.7	8.9	19.0
January	Snowfall in inches	11.2	15.0	29.2
Average Annual Snowfall Oct-Jan				
Average Annual Temp °F (High / Low)		60 / 41	60 / 43	56 / 40

- Based on what you've learned, which way do the cold Arctic winds travel? _____
- Lake-effect snow generally occurs in the first few months of winter. Can you guess why? (Hint: Think about the temperature of the water.)

Note: Because Lake Erie usually freezes over by late January, lake-effect snow in this region after that date is attributable to Lake Huron, which rarely freezes over due to its size and depth.