Geography in the News™

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YOU'RE DREAMING OF A WHITE CHRISTMAS?

Bing Crosby captured the romanticism of the Yuletide season more than 50 years ago with Irving Berlin's song "White Christmas." Children dream of snow during the holidays, in part, because Western culture perpetuates the idea that snow and Christmas go together. What's the chance of snow for any geographic area during the holidays?

Snowflakes are not frozen drops of water. They are composed of tiny ice crystals that form as water vapor passes from a gas to ice without going through the liquid state. The crystals make contact with one another and stick together forming snowflakes. Snowflakes range in size from just one or two crystals that are hardly visible up to large puffy flakes over 1 inch (2.5 cm) in diameter.

Snow contains differing amounts of moisture. For example, a snow may contain 1 inch of meltwater for every 10 to 12 inches of snow.

The heaviest snowfalls in the world do not occur in the Polar Regions. For example, northern Canada or Siberia average less than 60 inches (152 cm) per year. The annual snowfall is low in the Polar Regions because the low winter air temperature reduces the capacity of the air to hold moisture.

The largest annual snowfalls occur in the mountains of the middle latitudes in such places as the Alps of Europe and the Cascades, Sierra Nevada, and Rockies in the United States. *The World Book Encyclopedia* lists the 1,122 inches (2,850 cm) that fell at a weather station on Mt. Rainier, Wash., during 1972 as the record U.S. annual snowfall. A record 24-hour snowfall of 76 inches (193 cm) was recorded at a station in the Colorado Rockies in 1921.

Heavy mountain snowfalls are usually orographic in origin; that is, they are caused by air masses being cooled when forced to rise over mountain ranges. Even the Appalachians of North Carolina and the White and Green Mountains of New England receive heavier snowfalls than the surrounding areas partially for this reason.

Other regions of the world known for fairly heavy snows are the leeward sides of large lakes, the classic cases being the east sides of the Great Lakes in the United States and Canada. These are called "lake effect" snows caused by the wind blowing from water to land.

So what is the chance for a white Christmas? For Honolulu, Miami, and San Diego, the chances are none. The chances increase, however, as one moves northward. Anywhere mountains occur the chances of snowfall are dramatically better for any given date. Traveling northward across the eastern United States, however, chances increase to the point of having some snow during the holidays every few years northward of mid-Ohio and New York and southward through the higher Appalachians.

One must travel either to the northern tier of states, Canada, or one of several U.S. mountain ranges in order to be assured of finding snow during the holidays. The best bet would be the Rockies, the Sierra Nevada, or the Cascades. On the other hand, many of the eastern U.S. ski slopes begin operation about Thanksgiving on machine-made snow, and it's often supplemented with one or two natural snowfalls before Christmas.

For most parts of the country, white Christmases are so uncommon as to make the unusual one a memory of a lifetime. Maybe this will be the year.

And that's Geography in the News. Happy Holidays! December 13, 2002. #654.

(The author is a Geography Professor at Appalachian State University, Boone, NC. A version of this column was first published in Dec.1989 and is a favorite of teachers and students.)

Winter Wonderland