

Your Weather Guide

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Water Content of Snow

There is an old “rule of thumb” that says 1 inch of rain equals 10 inches of snow. Don’t believe it. The actual amount of liquid water in snow may vary from 1 inch of rain equals 5 inches of snow to 1 inch of rain equals over 20 inches of snow. So what makes the difference?

When meteorologists forecast the amount of liquid water that may fall from a storm there are many factors to consider. They include how much water is available in the storm, the relative humidity, and how efficiently will precipitation form, to name a few. There are in fact many factors involved which makes precipitation one of the most difficult elements to forecast.

Forecasting snow amounts is even tougher. Not only do forecasters need to forecast how much liquid water is available but they must contend with varying amounts of snow under similar conditions. For one thing the liquid to snow ratio is highly dependent upon temperature.

Studies have shown that the efficiency with which snow forms depends on at what temperature condensation



occurs. Various types of snowflakes form at different temperatures. Some snowflake types are more common during heavy snow events.

The chart on this page compares temperature, liquid water content of snow in inches and the amount of snowfall in inches. For example at a temperature of 35° .15 to .20 inches of liquid would produce 1 inch of snow. This is about a 5 to 1 ratio; 5 inches of snow for 1 inch of rain. At 30° the ratio is closer to 10 to 1; 10 inches of snow for a liquid equivalent of 1 inch of rain. At colder temperatures the ratio is much higher; at -10° to -15° only .02 inches is needed for 1 inch of snow which is a ratio of 50 to 1.

This chart works well in the Midwest where moisture from the Gulf of Mexico fuels storms. The high moisture content of the lower atmosphere allows moisture to condense on falling snowflakes making them heavier than flakes that fall in drier climates. Snowflakes falling into drier air do not collect additional moisture. The powder snow in some western ski areas is due to the drier air masses found in that part of the country.

The chart gives you an estimate of how much the water to snow ratio varies with temperature. The water content of saturated air at warmer temperatures is greater than when it is colder. Snowfall tends to be lighter and fluffier at very cold temperatures.

Temperature (°F)	Liquid Water Content (inches)	Snowfall (inches)
35°	.15—.20	1
30	.10—.15	1
25°	.09	1
20°	.07	1
15°	.06	1
10°	.05	1
5	.04	1
0° to -5°	.03	1
-10° to -15°	.02	1