

PRECIPITATION PROBABILITY

The probability of precipitation forecast is one of the most least understood elements of the weather forecast. The probability of precipitation has the following features:

- The likelihood of occurrence of precipitation is stated as a percentage
- A measurable amount is defined as 0.01" (one hundredth of an inch) or more (usually produces enough runoff for puddles to form)
- The measurement is of liquid precipitation or the water equivalent of frozen precipitation
- The probability is for a specified time period (i.e., today, this afternoon, tonight, Thursday)
- The probability forecast is for any given point in the forecast area

To summarize, the probability of precipitation is simply a statistical probability of 0.01" inch or more of precipitation at a given area in the given forecast area in the time period specified. Using a 40% probability of rain as an example, it **does not** mean (1) that 40% of the area will be covered by precipitation at given time in the given forecast area or (2) that you will be seeing precipitation 40% of the time in the given forecast area for the given forecast time period.

Let's look at an example of what the probability does mean. If a forecast for a given county says that there is a 40% chance of rain this afternoon, then there is a 40% chance of rain at any point in the county from noon to 6 p.m. local time.

This point probability of precipitation is predetermined and arrived at by the forecaster by multiplying two factors:

$$\begin{array}{c} \text{Forecaster certainty that precipitation will form or move into the area} \\ \times \\ \text{Areal coverage of precipitation that is expected} \\ \text{(and then moving the decimal point two places to the left)} \end{array}$$

Using this, here are two examples giving the same statistical result:

- (1) If the forecaster was 80% certain that rain would develop but only expected to cover 50% of the forecast area, then the forecast would read "a 40% chance of rain" for any given location.
- (2) If the forecaster expected a widespread area of precipitation with 100% coverage to approach, but he/she was only 40% certain that it would reach the forecast area, this would, as well, result in a "40% chance of rain" at any given location in the forecast area.