

WEATHER

BASICS



IDENTIFY AND UNDERSTAND CLOUDS,
PRECIPITATION, AND MORE



Ryan Henning

Adventure Skills Guides

GET TO KNOW THE BASICS OF METEOROLOGY

Adventure Skills Guides

Weather is the complicated interplay of invisible, fluid forces in the atmosphere. The results of those forces, though, are visible, audible, and certainly impactful. Most of the time, we aren't carrying meteorology textbooks or know exactly what to search for on the Internet when we need to know how to identify (or react to) what we are seeing. This Skills Guide is intended as a quick reference to clouds, precipitation, and what they mean, as well as the basics of how to stay safe.

RYAN HENNING

Ryan Henning was born and raised in Minnesota, where he spent most of his formative years in the Minneapolis suburb of Victoria. There, he developed a fascination with the weather, thanks largely to his dad's career in the airline industry. (Ryan loved the radar!) After earning a degree in synoptic meteorology from Purdue University, Ryan worked as an aviation meteorologist for eight years. He now runs his own website and blog at Victoria-Weather.com.

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While we often think of them as a simple background to our daily lives, cloud types can tell you a lot about the weather.

CLOUD BASICS

- Lower clouds are more likely to produce precipitation.
- Cooler temperatures generally lead to lower cloud bases.
- More bulbous, textured clouds indicate that there's more activity in the atmosphere; such clouds are more likely in warm conditions.



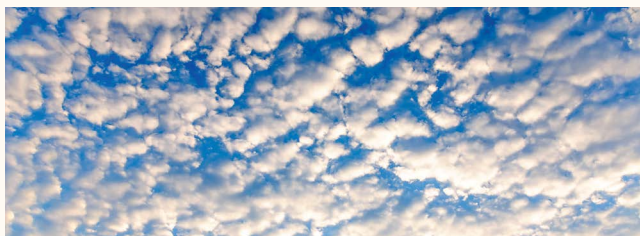
Cirrus are high, wispy clouds that are made of ice crystals. Generally speaking, they are fair-weather clouds. If cirrus clouds are accumulating, they may be at the leading edge of an advancing storm system, though there would be no immediate threat.



Cirrostratus are a blanket of high-level clouds. They may precede a larger storm system, but there would rarely be an immediate threat.



Cirrocumulus (herringbone) patterns in clouds generally mean that winds at cloud level are brisk. When they appear in high clouds, it may correlate with the jet stream. The “ribs” of the cloud will be perpendicular to the wind. If chevrons form, they will point in the direction that the wind is blowing, and will suggest the direction that any inclement weather will move.



Altocumulus are mid-level clouds that rarely portend bad weather, though they may, in isolated circumstances, produce a couple of drops of rain. They generally appear as a broken sheet of clouds across the sky, often in a pattern, such as “puffs” or striations.



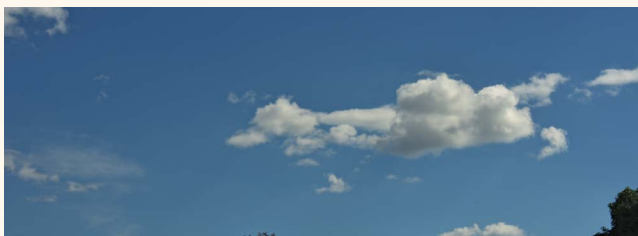
Altostratus are sheets of somewhat thin clouds that are higher in the sky than stratus, but thicker and lower than cirrostratus. They tend to be gray, but not as dark gray as nimbostratus clouds. They often appear in conjunction with warm fronts, and are replaced by nimbostratus as rain approaches. They easily reflect wind patterns, producing ripples in an otherwise flat texture, or developing gaps.



Stratocumulus clouds blanket the sky with a patchwork of clouds. Generally speaking, stratocumulus are not a source of a lot of rain, though some light rain is possible with them. If they are generally moving in from the west, they can indicate thicker clouds or precipitation that is on the way.



Stratus clouds give us “overcast” skies. While stratus may produce precipitation, lower, darker clouds (known as nimbostratus clouds), generally carry a better chance of rain or snow.

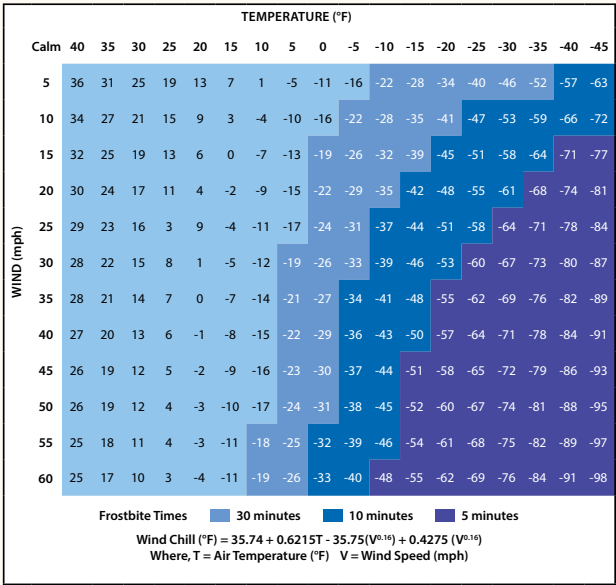


Cumulus are bulbous, puffy clouds that are most common in warmer temperatures. Small isolated cumulus clouds are common in fair weather, but large and growing clouds, especially when joined by other similar clouds, are indicative of developing rain or thunderstorms.

WIND CHILL

Cold poses a real danger to the human body. Wind chill is the combination of cold air temperatures plus wind. The wind chill chart shows what the temperature feels like with different combinations of wind speeds and air temperatures. The color coded areas represent the length of time it takes for frostbite to affect exposed skin. In the worst conditions, frostbite can occur in as little as five minutes.

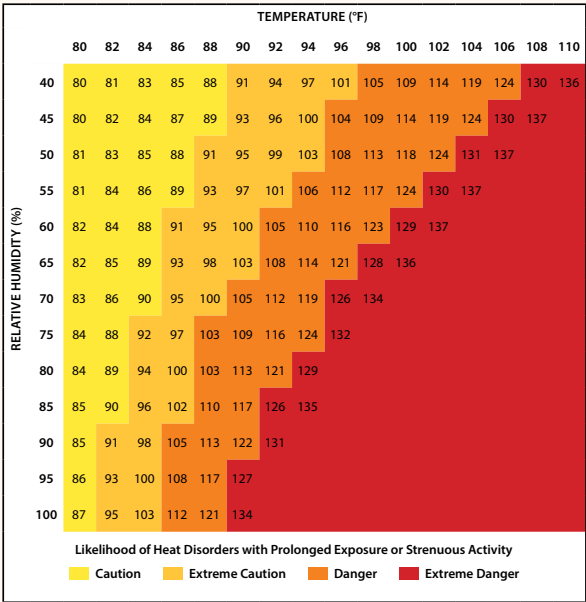
Wind Chill



HEAT INDEX

The heat index approximates what the temperature will feel like with varying combinations of heat and relative humidity, as well as indicates the danger of particular combinations. If temperatures are high enough, it doesn't take much to turn a warm day into a potentially dangerous one.

Heat Index

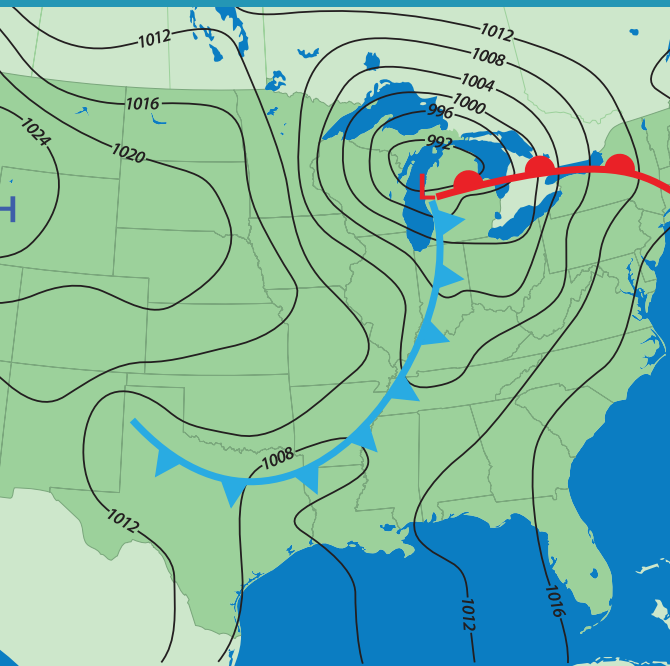


HOW TO READ A WEATHER MAP

Black lines on a weather map represent isobars. The prefix *iso* means “equal” and bars or millibars are the measure of atmospheric pressure. An isobar is therefore a line of equal pressure. Lower numbers represent lower pressure and higher numbers reflect higher pressure.

The blue line with triangles on it is a cold front, with the triangles pointing in the direction in which the front is moving. The red line with half circles is a warm front, with those half circles pointing in the direction in which the front is moving. Note that the fronts lie in areas where the otherwise circular rings around the center of low pressure are contorted. Other distensions in these concentric circles represent troughs and are likely areas of precipitation.

Though not used in this example, other common features on surface maps are stationary fronts, represented by an alternating line of blue triangles and red half circles pointed in opposite directions; occluded fronts, which are purple lines with half circles and triangles all pointing in the same direction; and brown or purple dashed lines, which are catchall symbols, either for surface troughs or dry lines.



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