

Wind Chill Encyclopedia Article

Wind Chill

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Wind Chill

Wind chill is the **temperature** sensed by humans as a result of air blowing over exposed skin. The temperature that humans actually feel, called the *sensible temperature*, can be quite different from the temperature measured in the same location with a thermometer. The reason for such differences is that the human body constantly gives off and absorbs heat in a variety of ways. For example, when a person perspires, **evaporation** of moisture from the skin removes heat from the body, and one feels cooler than the true temperature would indicate.

In still air, skin is normally covered with a thin layer of warm air that insulates the body and produces a sensible temperature somewhat higher than the air around it. When the wind begins to blow, that insulating layer is swept away, and body heat is lost to the surrounding atmosphere. An individual begins to feel colder than would be expected from a thermometer reading at the same location.

The faster the wind blows, the more rapidly heat is lost and the colder the temperature appears to be.

Wind chill charts or conversion tables relate the relationship among actual temperature, wind speed, and wind chill factor, to the temperature felt by a person at the given wind speed. According to standard conversion formulae, a wind speed of 4 mi/h (6 km/h) or less results in no observable change in temperature sensed. At a wind speed of 17 mi/h (30 km/h) and a temperature of 32°F (0°C), however, the perceived temperature is 7°F (−14°C).

Wind chill relationships are not linear. The colder the temperature, the more strongly the wind chill factor is felt. At a wind speed of 31 mi/h (50 km/h), for example, the perceived temperature at 32°F (0°C) is 7°F (−14°C), but at −40°F (−40°C), the perceived temperature is −112°F (−80°C).

See Also

Antarctica; Atmospheric Lapse Rate; Aviation Physiology; Beaufort Wind Scale; Humidity; Space Physiology