

## What is Wind Chill Temperature?

It is the temperature it “feels like” outside and is based on the rate of heat loss from exposed skin caused by the effects of wind and cold. As the wind increases, the body is cooled at a faster rate causing the skin temperature to drop. Wind Chill does not impact inanimate objects like car radiators and exposed water pipes, because these objects cannot cool below the actual air temperature.



## What does this mean to me?

The NWS will inform you when Wind Chill conditions reach critical thresholds. A Wind Chill Warning is issued when wind chill temperatures are life threatening. A Wind Chill Advisory is issued when wind chill temperatures are potentially hazardous.

## What is Frostbite?

Frostbite is an injury to the body caused by freezing body tissue. The most susceptible parts of the body are the extremities such as fingers, toes, ear lobes, or the tip of the nose. Symptoms include a loss of feeling in the extremity and a white or pale appearance. Medical attention is needed immediately for frostbite. The area should be SLOWLY re-warmed.

## What is Hypothermia?

Hypothermia is abnormally low body temperature (below 95 degrees Fahrenheit). Warning signs include uncontrollable shivering, memory loss, disorientation, incoherence, slurred speech, drowsiness, and apparent exhaustion. Medical attention is needed immediately. If it is not available, begin warming the body SLOWLY.

## Tips on how to dress during cold weather.

- ✓ Wear layers of loose-fitting, lightweight, warm clothing. Trapped air between the layers will insulate you. Outer garments should be tightly woven, water repellent, and hooded.
- ✓ Wear a hat, because much of your body heat can be lost from your head.
- ✓ Cover your mouth to protect your lungs from extreme cold.
- ✓ Mittens, snug at the wrist, are better than gloves.
- ✓ Try to stay dry and out of the wind.

For more Information on cold-related health problems and outdoor safety visit the web site from the Centers for Disease Control and Prevention (CDC) at: <http://emergency.cdc.gov/disasters/winter/guide.asp>

Visit the National Weather Service Wind Chill web page at: <http://www.nws.noaa.gov/om/windchill/>

Visit Environment Canada’s Wind Chill web page at: <http://www.ec.gc.ca/meteo-weather/default.asp?lang=En&n=5FBF816A-1>

# Wind Chill Temperature Index



## National Weather Service

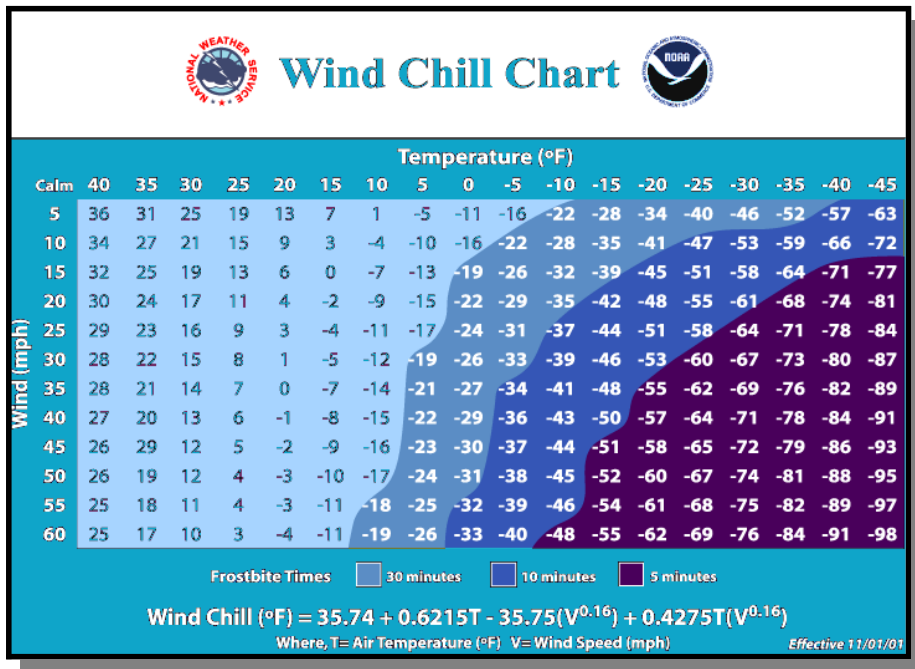


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# Wind Chill Temperature Index

On November 1, 2001, the National Weather Service implemented a new Wind Chill Temperature (WCT) index, designed to more accurately calculate how cold air feels on human skin. The former index used by the United States and Canada was based on 1945 research of Antarctic explorers Siple and Passel. They measured the cooling rate of water in a container hanging from a tall pole outside. A container of water will freeze faster than flesh. As a result, the previous wind chill index underestimated the time to freezing and overestimated the chilling effect of the wind. The current index is based on heat loss from exposed skin and was tested on human subjects.

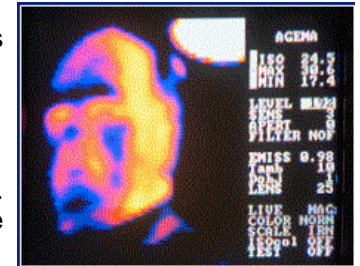


The Wind Chill Chart above includes a frostbite indicator, showing the points where temperature, wind speed and exposure time will produce frostbite on humans. The chart above includes three shaded areas of frostbite danger. Each shaded area shows how long (30, 10 and 5 minutes) a person can be exposed before frostbite develops.

For example, a temperature of 0°F and a wind speed of 15 mph will produce a wind chill temperature of -19°F. Under these conditions, exposed skin can freeze in 30 minutes.

# Development of the New Wind Chill Temperature Index

During the fall of 2000, the Office of the Federal Coordinator for Meteorological Services and Supporting Research (OFCM) organized a joint U.S.–Canadian government-sponsored action group to develop, test and implement a new WCT Index. The group is called the Joint Action Group for Temperature Indices (JAG/TI). The goal of JAG/TI is to internationally upgrade and standardize the Wind Chill Index.



Early summer of 2001, human trials were conducted at the Defence and Civil Institute of Environmental Medicine in Toronto, Canada. The trial results were used to improve the accuracy of the new formula and determine frostbite threshold values. During the human trials, 6 male and 6 female volunteers were placed in a chilled wind tunnel. Thermal transducers were stuck to their faces to measure heat flow from the cheeks, forehead,

nose and chin while walking 3 mph on a treadmill. Each volunteer took part in four trials of 90 minutes each and was exposed to varying wind speeds and temperatures.

The new wind chill does the following:

- Calculates wind speed at an average height of 5 feet (typical height of an adult human face) based on readings from the national standard height of 33 feet (height of an anemometer)
- Is based on a human face model
- Incorporates modern heat transfer theory
- Lowers the calm wind threshold from 4 mph to 3 mph
- Uses a consistent standard for skin tissue resistance
- Assumes no impact from the sun (i.e., clear night sky).