

Polar Vortex: The Cold Snap of 2014

**A BioEd Online
Not-so-Hot Topic**

Image Credit: NASA

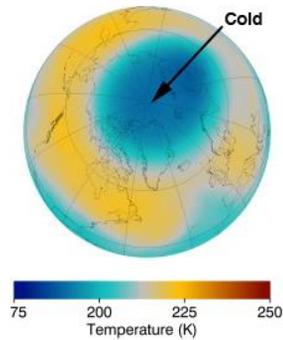
http://ozonewatch.gsfc.nasa.gov/facts/vortex_NH.html



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Arctic Polar Vortex

- Spinning area of low pressure above the North pole contained by strong winds.
- Air in the vortex becomes colder in winter.
- Changes in weather patterns can push the Arctic vortex southward, causing colder than normal temperatures in non-polar regions.



References

Arctic Change, National Oceanic and Atmospheric Administration (NOAA)

<http://www.arctic.noaa.gov/detect/climate-strat.shtml>

Warm Arctic – Cold Continents, NOAA,

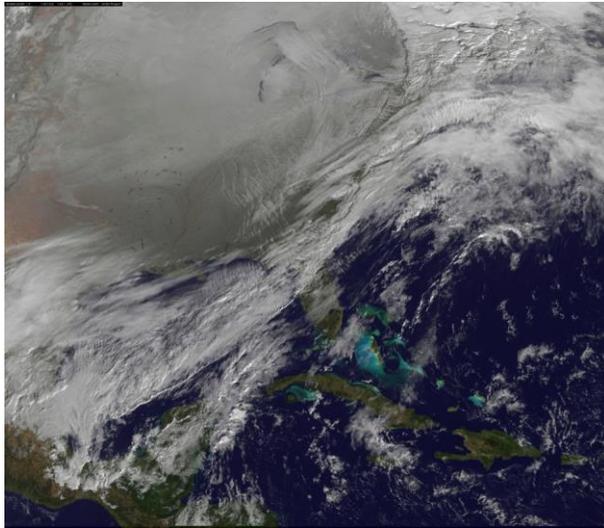
http://www.arctic.noaa.gov/future/warm_arctic_cold_continent.html

What is the Polar Vortex, National Aeronautics and Space Administration,

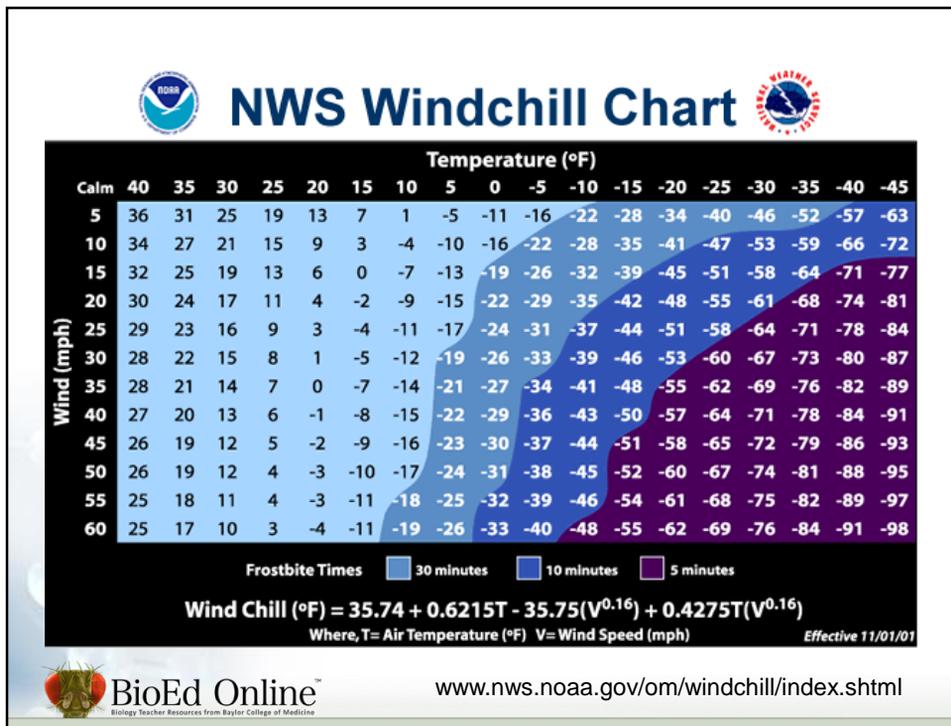
http://ozonewatch.gsfc.nasa.gov/facts/vortex_NH.html

US East Coast on January 6, 2014

Frontal system along the US East Coast, with clearer skies associated with the polar vortex behind the front.



This image was captured by NOAA's GoES-East satellite on Jan. 6, 2014, at 11:01 a.m. EST (1601 UTC). A frontal system that brought rain to the coast is draped from north to south along the US East Coast. Behind the front lie the clearer skies and bitter cold air associated with the polar vortex (<http://www.nasa.gov/content/goddard/polar-vortex-enters-northern-us/#.UswdTRmnyr8>).



The National Weather Service Windchill Temperature (WCT) index uses advances in science, technology and computer modeling to provide an accurate, understandable and useful formula for calculating the dangers of winter winds and freezing temperatures.

The WCT:

- calculates wind speed at an average height of five feet, the typical height of an adult human face, based on readings from the national standard height of 33 feet, the typical height of an anemometer;
- is based on a human face model;
- incorporates heat transfer theory—heat loss from the body to its surroundings during cold and breezy/windy days;
- lowers the calm wind threshold to 3 mph;
- uses a consistent standard for skin tissue resistance; and
- assumes no impact from the sun (i.e., clear night sky).

Image Credit: National Weather Service,
<http://www.nws.noaa.gov/om/windchill/index.shtml>