



## Polar Vortex

Recently, the **United States** is grappling with **extreme cold with temperature** reaching to  $-30^{\circ}\text{C}$  in cities like Chicago and Dakota.

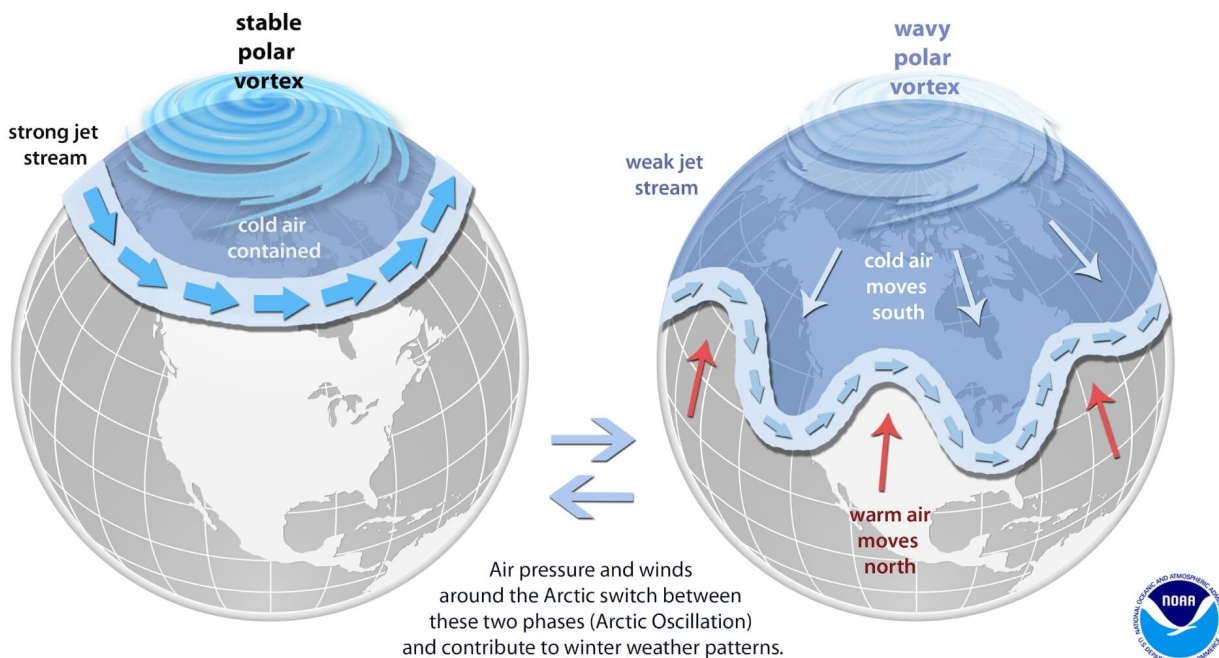
- This is caused by a blast of **Arctic air, which is a result of a “polar vortex” event.**
- The polar vortex is a **large area of low pressure** and **cold air** surrounding both of the Earth’s poles. It was also known as the **Polar Pig.**
- The term "vortex" refers to the **counterclockwise flow of air** that helps keep the colder air near the Poles. It **always exists** near the poles, but weakens in summer and strengthens in winter.
- However, many times **during winter** in the northern hemisphere, the **polar vortex will expand, sending cold air southward.** This occurs fairly regularly during wintertime and is often associated with large outbreaks of Arctic air in the **United States and portions of Europe and Asia.**
- It is also not a feature that exists at the Earth’s surface, rather it exists tens of **thousands of feet up in the atmosphere.**
- By itself, the only danger to humans is the magnitude of how cold temperatures will get when the polar vortex expands, sending Arctic air southward into areas that are not typically that cold.

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## The Science Behind the Polar Vortex

The polar vortex is a large area of low pressure and cold air surrounding the Earth’s North and South poles. The term vortex refers to the counterclockwise flow of air that helps keep the colder air close to the poles (left globe). Often during winter in the Northern Hemisphere, the polar vortex will become less stable and expand, sending cold Arctic air southward over the United States with the jet stream (right globe).

The polar vortex is nothing new — in fact, it’s thought that the term first appeared in an 1853 issue of E. Littell’s *Living Age*.



## How is it Linked to Global Warming

- The global temperature has risen by 0.8°C since 1880.
- The **Arctic has warmed** over twice the average.
- The **temperature difference** between North Pole and regions like North America **has reduced**.
- The **energy generated by the jet stream** travels upward and disrupts the **polar vortex, causing it to split**.
- One of **these two "child" vortices** has visited North America this week, **causing the record temperatures**.

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