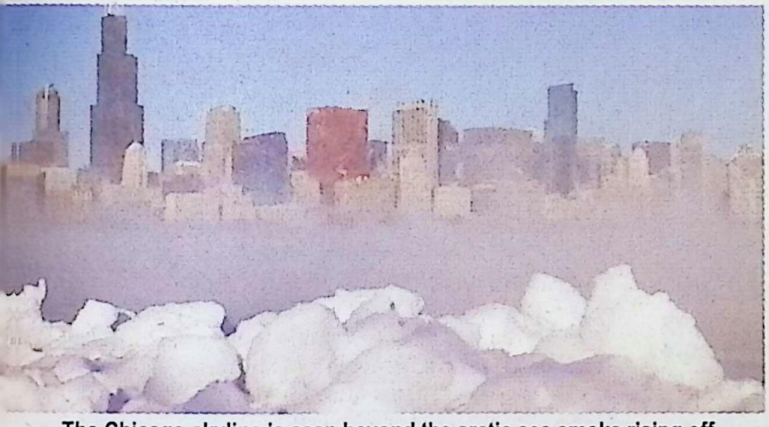
"The vortex is normally very stable and keeps air bottled," said James E. Overland, a scientist with the National Oceanic and Atmospheric Administration in a press conference.

In the last week, though, a kink developed in the vortex's winds, delivering arctic air to the Plains and the Midwest, forcing warmer air out of the way. That cold air drove temperatures down in cities across the US. The kink created a trough of cold, dry air in the Plains and Midwest. At the same time, outside the trough, warm moist air was brought up from the south. As the kink travelled eastward across the country, the warm air was quickly replaced by the cold, and the mercury fell, sometimes startlingly fast.

"It just so happens that the air this time has managed to grow unusually cold," wrote Jeff Masters, director of meteorology with the website Weather Underground.



The Chicago skyline is seen beyond the arctic sea smoke rising off Lake Michigan in Chicago, Illinois, January 6, 2014. PHOTO: REUTERS

But that hardly answers the question: What makes weather go to such extremes? The catastrophic weather phenomenon has also renewed the discussion on the impact of anthropomorphic, or human-induced, climate change.

The most common response is, of course, global warming. Global warming activists, after giving the world long 48 hours of silence after the cold temperatures hit, now say they have always predicted that global warming would cause more frequent and severe winter cold spells. But, if global warming alarmists really had predicted that it would cause more frequent and severe cold outbreaks, we should see such predictions all throughout the latest United Nations Intergovernmental Panel on Climate Change (IPCC) report. The problem is, it's not there. Here is what IPCC predicted on the topic of global warming and winter cold outbreaks: "warmer winters and fewer cold spells, because of climate change."

It has emboldened climate change sceptics who point to the record cold weather as evidence that the globe isn't warming.

But is that so?

""It could be that melting Arctic ice is making sudden cold snaps more likely—not less," writes Time magazine.

The fact is occasional cold snaps-even one as extreme as much of the U.S. is experiencing now-doesn't disprove global warming.

This is why.

Right now much of the U.S. is in the grip of a polar vortex, which is pretty much what it sounds like: a whirlwind of extremely cold, extremely dense air that forms near the poles. Usually the fast winds in the vortex-which can exceed 100 mph-keep that cold air locked up in the Arctic. But when the winds weaken, the vortex can begin to wobble like a drunk on his twelfth beer, and the Arctic air can escape and spill southward, bringing Arctic weather with it. In this case, nearly the entire polar vortex has tumbled southward, leading to record-breaking cold.

But what triggered the disruption to the polar vortex in the first place? Meteorologist Rick Grow writes in the *Washington Post*, "Large atmospheric waves move upward from the troposphere — where most weather occurs — into the stratosphere, which is the layer of air above the troposphere. These waves, which are called Rossby waves, transport energy and momentum from the troposphere to the stratosphere. This energy and momentum transfer generates a circulation in the stratosphere, which features sinking air in the polar latitudes and rising air in the lowest latitudes. As air sinks, it warms. If the stratospheric air warms rapidly in the Arctic, it will throw the circulation off balance. This can cause a major disruption to the polar vortex, stretching it and — sometimes — splitting it apart."

The freezing temperatures in Oklahoma had cattlemen such as Harvey Boatwright of Lawton, crossing their fingers that pregnant cows won't give birth during the coldest hours. "The newborns could stick to the ground and die," says 70-year old Boatwright. "I leave the cows out overnight because they're too messy to stay inside a barn. Even before the temperatures dipped to well below zero, some cows had collected fins of icicles down their backs. I've never seen anything like it."

Boatright is glad that all 80 of his cattle had survived and none had given birth. "But none of my three new tractors would start."

Back in Bartlesville, restaurant owner Rezaul Karim is praying that the freezing temperatures followed by occasional blizzards that howled through the state will go away soon. "Global warming or not, this weather has to go. My business is hurting."