

Weather vs Climate

If global warming is real, why is it so cold? If we're so worried about global warming why has it been so cold here in the U.S., in Europe and other parts of the globe? What do weather statistics say has happened during the past 50 years? And how does weather differ from climate (is there a difference)?—A CEO, an oceanographer, a climate change advisor, a pastor, and a specialist in energy and environmental issues shared their thoughts in a recent “weather vs climate” blog

LOOK BEYOND PRECONCEPTIONS

William O’Keefe, CEO, George C. Marshall Institute

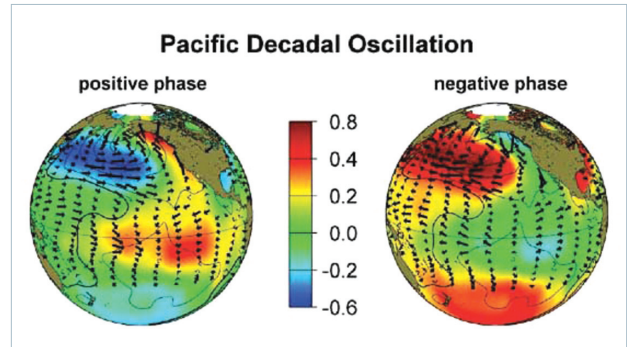
What we experienced this winter was weather. The weather on any given day or during any given season doesn’t tell a lot about our climate. But, weather over time is our climate, and if a pattern persists over time, it can be indicative of a change in climate.

To some extent, we are all captives of our preconceptions. Those who assert that man-made global warming or climate change is leading us to a climate catastrophe dismiss this year’s very cold weather as either a sign of global warming or just an example of natural variability that masks the damage being done by fossil energy consumption. Those who are more skeptical about man being the primary cause of warming over the last half of the 20th century point to the lack of warming since the 1998 El Nino as indicative that the climate system is robust with many self-correcting mechanisms.

How do we know which characterization is correct? The first thing we have to do is step away from our preconceptions and look at the evidence carefully and objectively. We know that much of what is used to predict that human activity will lead to a climate catastrophe comes from complex computer models. And, we know that these models do not have a good record in either back-casting past temperatures or forecasting current ones.

Indeed the models have over-predicted temperatures over the past few decades and did not predict the lack of temperature increases since the start of this decade. We also know that over the past 110 years, temperatures increased for about 45 years, decreased for 30, and then increased from the mid 1970 to the end of the century. None of the models can replicate this climate pattern. Explanations are offered for the reason why, but explanations are not in and of themselves proof.

Dr. Roy Spencer of the University of Alabama at Huntsville has published work suggesting that a climate phenomenon known as the Pacific Decadal Oscillation could be the explanation for the patterns observed over the past century, and, more specifically, the recent cooling. Others believe that solar activity over the past 30+ years explains much of the warming from the mid 1970s and the cooling that is



Winter sea surface temperature, wind pattern (arrows), and sea level pressure (contour) anomalies for the warm (left) and cool (right) phase of the Pacific Decadal Oscillation. (Courtesy of Nate Mantua, JISAO Univ. of Washington.) Image courtesy of Exploring Alaska’s Seamounts 2002, NOAA/OER.

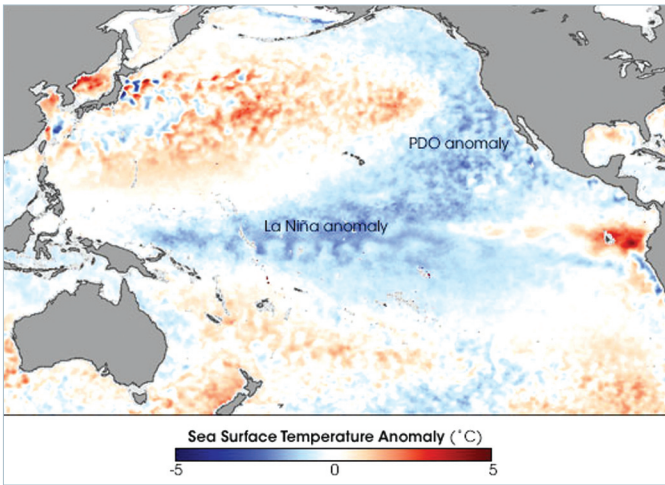
now taking place. Neither explanation is intended to deny that human activities affect climate.

Last year because of the worst recession in decades, emissions declined. With a recovery expected to be gradual, emissions growth for at least this year will be slight. That reality provides an opportunity to take another look at the evidence, one that is really objective, robust, and transparent. Such a review in my opinion would confirm that the extent of human influence has been overstated and the prescribed corrective actions—cap and trade—are therefore excessive. Before this nation proceeds further down a path that would impose hundreds of billions of dollars of additional costs on the economy and our citizens, we should have a higher level of confidence that the actions taken match our understanding of the climate system and human influence on it.

CLIMATE CHANGE, NOT CHANGE IN THE WEATHER

Donald F. Boesch, oceanographer; president of the University of Maryland Center for Environmental Science; vice chancellor for Environmental Sustainability for the University System of Maryland

Simply stated, weather is what we experience from one day to the next; climate is what we would normally expect. Both vary. Last winter, the high temperature in Denver was a bone-chilling 14 F on one day, but next day, Denver

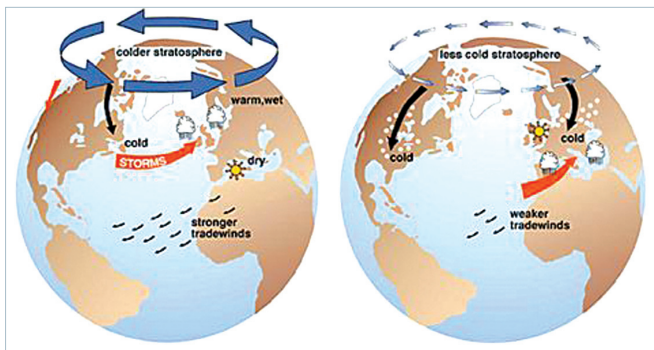


La Niña and Pacific Decadal Oscillation Cool the Pacific. [Source: <http://earthobservatory.nasa.gov>.]

approached a shirtsleeve-wearing 60 F. Does this demonstrate global cooling or global warming? Neither, of course, and both proponents of global warming and contrarians should avoid over-hyping specific weather events.

Similarly, some years are decidedly cooler or warmer than others, not just in Denver but in many parts of the world. Many variations in climate are caused by cycles, or oscillations, that take place over months, years, or even a decade. Some are influenced by currents in the oceans, the principal medium of heat storage on the planet.

The most prominent is the often-cited El Niño oscillation in the Pacific Ocean. Unusually warm water in the eastern Pacific brings El Niño and warmer global average temperatures, while the opposing La Niña results in cooler average temperatures.



The two phases of the Arctic Oscillation: Left: Warm phase; Right: Cold phase. [From The National Snow and Ice Data Center’s web page on the Arctic Oscillation. Image source: <http://oceanworld.tamu.edu>.]

The cold 2010 winter in many parts of the U.S. and northern Europe has been caused by another oscillation, the Arctic oscillation. A strong high pressure over Greenland deflects the cold air of the jet stream farther to the south than usual. But Arctic temperatures have been quite a bit warmer than usual, as are temperatures around the Medi-

terranean, most of Africa, South America, and south Asia.

With so much variability in climate throughout the world, over seasons and from year to year, how do we know if the Earth’s climate is really changing? One approach is to evaluate the changes in annual temperature averaged over the entire planet, including the surface waters of the ocean.

Global average temperature has shown a clearly increasing trend since the 1950s—of course, still with increases or decreases from one year to the next because of climate variability. The last decade was the warmest since temperature measurements began, as were the 1990s, and the 1980s before them. We are unequivocally advancing toward the 2 degrees Celsius increase in global average temperature that the Copenhagen Accord commits to avoid.

THE WEATHER BELONGS ON THE EVENING NEWS

David Hone, climate change adviser, Shell Group; vice chairman of the International Emissions Trading Association

At times of weather extremes, both hot and cold, windy or wet, the issue of climate change seems to come up. Last winter, with large swathes of the Northern Hemisphere experiencing bitterly cold temperatures and heavy snow-falls the question comes up again—how can a warming world experience such weather?

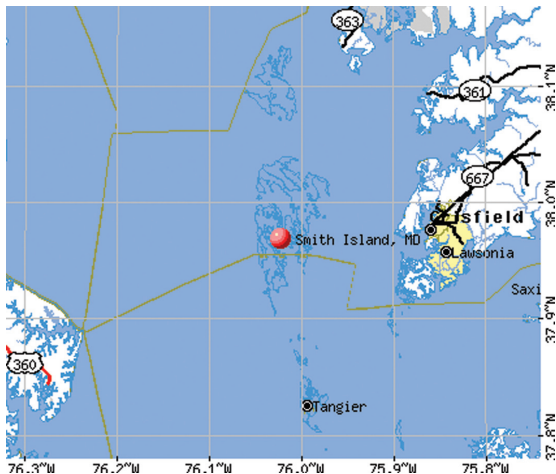
Therein lies the issue—a short-term weather phenomenon is not the same as long-term climate change. In fact, the way scientists model long-term climate change bears little resemblance to the way others forecast short-term weather, yet many will point to a failing in the latter to criticize the findings of the former.

Models for short-term weather forecasting are highly dependent on the input data for the start of the period—i.e., what are the conditions I can see right now. Multi-decadal climate forecasts are not very sensitive to the initial conditions and they do not include data assimilation, so they are not expected to simulate the exact sequence of historical, let alone future, weather events.

Whilst the two must be linked, many other short-lived changes drive the day-to-day weather. For example, the particularly cold winter of 2009-2010 also coincided with a deep minimum in the regular solar irradiance cycle, but the solar minimum existed last year as well and the winter in Europe was relatively mild. Or was it? We tend to remember the events that affect us directly and have little appreciation of the global picture, which is what climate change is really all about. Take December 2009 as an example—whilst a deep cold area persisted over parts of North America and Russia, the Canadian Arctic, the seas north of Norway, and parts of eastern Russia were experiencing temperatures many degrees above normal.

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Of course, the evening news reported none of this, largely because almost nobody lives in these regions. Rather, the news readers did their job and reported local conditions for their viewers. As rising CO2 levels in the atmosphere warm the overall climate, we should also see rising levels of moisture in the air. Under the right circumstances, this can lead to much heavier snowfall than might otherwise have been the case. Heavy snowfall leaves people with the perception of a much harsher winter than normal.



SHORT TERM VS LONG TERM

Rick Edmund, pastor of the United Methodist church in Smith Island, Maryland

I don't think anyone would believe that weather and climate are the same thing anymore than that one's mood and personality are equal. We all have moods that don't accurately describe our overall personality. However, if mood swings become more and more frequent, then perhaps we are being warned that a problem, physical or emotional, might be causing our personality to change, and a doctor needs to be summoned. If we are consistently seeing weather patterns changing in one direction, then perhaps we need to examine why it is happening.

A period of 50 years might be long enough to detect a pattern in individual weather conditions, usually measured by temperature, that could mean a change in climate. Even if the planet is warming, a cold winter in the Northern latitudes doesn't mean the Earth is really getting colder, or even staying the same. It is just as wrong to use a hot season to support global warming as it is to use a colder one to debunk the theory.

As I've written before, it seems that most of us interested in possible climate change come to the examining table with preconceived notions rather than open minds. We feed on information that supports our point of view rather than looking objectively at the long-term facts. And this is true for both sides of the controversy. Perhaps a starting

point could be that we all agree that a couple of current generations are the stewards of what we will environmentally pass along to future caretakers.

COLD SPELL DOESN'T UNDERCUT THE CRISIS—BUT OTHER THINGS DO

Ben Lieberman, specialist in energy and environmental issues; senior policy analyst at The Heritage Foundation's Roe Institute for Economic Policy Studies

Turnabout is fair play for activists who insist that a single event like this winter's cold snap doesn't disprove global warming. They're right that it doesn't, but neither does a summer heat wave prove it—yet this has not stopped proponents of doom from hyping each one. What matters are longer-term trends, and those are pointing away from the notion that climate change is a crisis.

While the chilly start to the year does not a trend make, we are in a decade-long period of no additional warming, despite continuously rising carbon dioxide concentrations. That is a significant trend, and it is also important because it undercuts the notion that there is some near-infallible scientific consensus about global warming and mankind's contribution to it. Consider the United Nation's 2007 Intergovernmental Panel on Climate Change (IPCC) report, the supposed gold standard of consensus science. None of the climate models relied upon by the IPCC foresaw the current flattening out of temperatures, yet these are the models whose predictions of future warming form the basis of several US and UN proposals.

While this winter's cold spell does not by itself undercut the global warming theory, it is not without its policy lessons. The deep freeze claimed a number of lives across the country, and, indeed, extreme cold is deadlier than extreme heat. The possibility of potential benefits as well as risks from a slightly warmer future (whether naturally caused or not) should be a part of the global warming debate, but rarely is.

Some activists, in a move that smacks of opportunism, are now claiming that the cold snap was evidence that global warming increases extreme weather events, be it unusual cold or heat. In fact, the evidence of an uptick in extreme weather is thin. When it comes to cold spells, heat waves, hurricanes, droughts, floods, or other natural disasters, the only clear trend is the dramatic drop in the number of deaths from them. There has been a 95 percent drop in annual mortality from extreme weather events since 1900, with no change in the decline during periods of warming over that span.

Folks shoveling their driveways or cranking up their thermostats were becoming less convinced about global warming and the merits of costly policies to address it. They may have been growing skeptical for the wrong reasons, but their skepticism was right on the money.