

Climate Change—Another Perspective

By Karl Bohnak

He's not an NMU alumnus, but for many of you who attended NMU in the past few decades, TV6 meteorologist Karl Bohnak has been the voice of U.P. weather. Visit www.upweatherhistory.com to learn more.

I am often asked what I think about “Global Warming.” It is an issue that ignites passion in many of us because it has crossed over from the scientific into the political realm. As a weather observer, forecaster and communicator, I have a point of view I would like to share.

To start, let us examine the current warming trend we have experienced over the last few decades. To put this trend into perspective, I turn to a friend and colleague, Jon Davis. He is a Chicago-based meteorologist, forecasting for energy concerns and commodities. He has been watching global weather patterns for decades. “There is no question we have been in a warming trend for the last 50 years,” states Davis. “It kind of started in the fifties, then you cooled a little bit in the sixties and parts of the seventies, then you’ve really warmed up from that point on. Unquestionably, we’ve warmed, and not only here, but everywhere.”

Davis uses this information when putting together a seasonal forecast. He catalogs the variables that he and his team feel will be keys in driving the weather over the season in question. One of the variables he now uses regularly is what forecasters call “trend.” In this case, it is the warming trend over the last half century. “You have to add that warming component into a seasonal

forecast,” he explains. “If we think all the variables equal each other out, then trend would point us in the warm direction.”

As to why we are warming, that question crosses the line into our greatest climate debate. “I don’t think there is any question that human activity has caused some of the warming,” says Davis. The data is so overwhelming.” But this does not answer the question to his satisfaction. Natural factors are responsible for the warming, too. “Over the last 10 years, there’s been really sparse volcanic activity,” he explains. “Simply put, the earth’s greatest polluters—volcanoes—have been relatively quiet for some time now. “If you look at aerosol projection globally [the material volcanoes throw into the atmosphere], they’re about as low as they’ve ever been,” he explains.

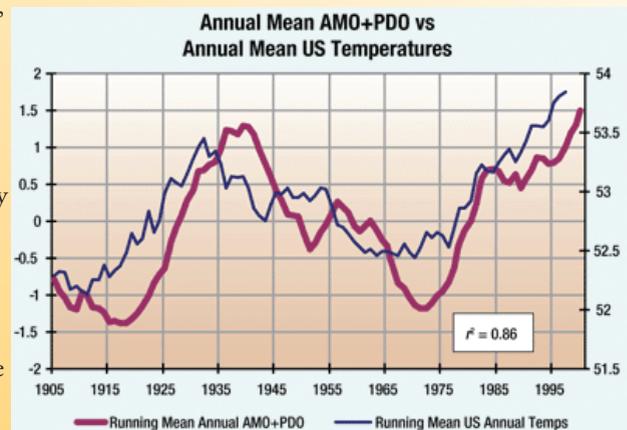
Volcano debris, pushed high into the atmosphere, interacts chemically with certain gases, blocking sunlight, which results in global cooling. Davis also says the ocean has put more warmth into the atmosphere over the last quarter-century or so. “We’ve trended to an environment with more El Nino events [the warming of the equatorial eastern Pacific]. That means more warmth over the long haul.”

When asked what he believes is

the most important factor in this warming, he states candidly, “I have no idea. That’s a question that nobody can answer. Is this human factor 10 percent of the equation’s influence or is it seventy?”

If you pay attention to the news, it would appear that man’s activities are the main—possibly the only—catalyst in this warming and that the planet will continue to warm with catastrophic consequences. Further, those legitimate scientists with studies countering these claims are marginalized and placed in the category of “deniers” or “industry shills.”

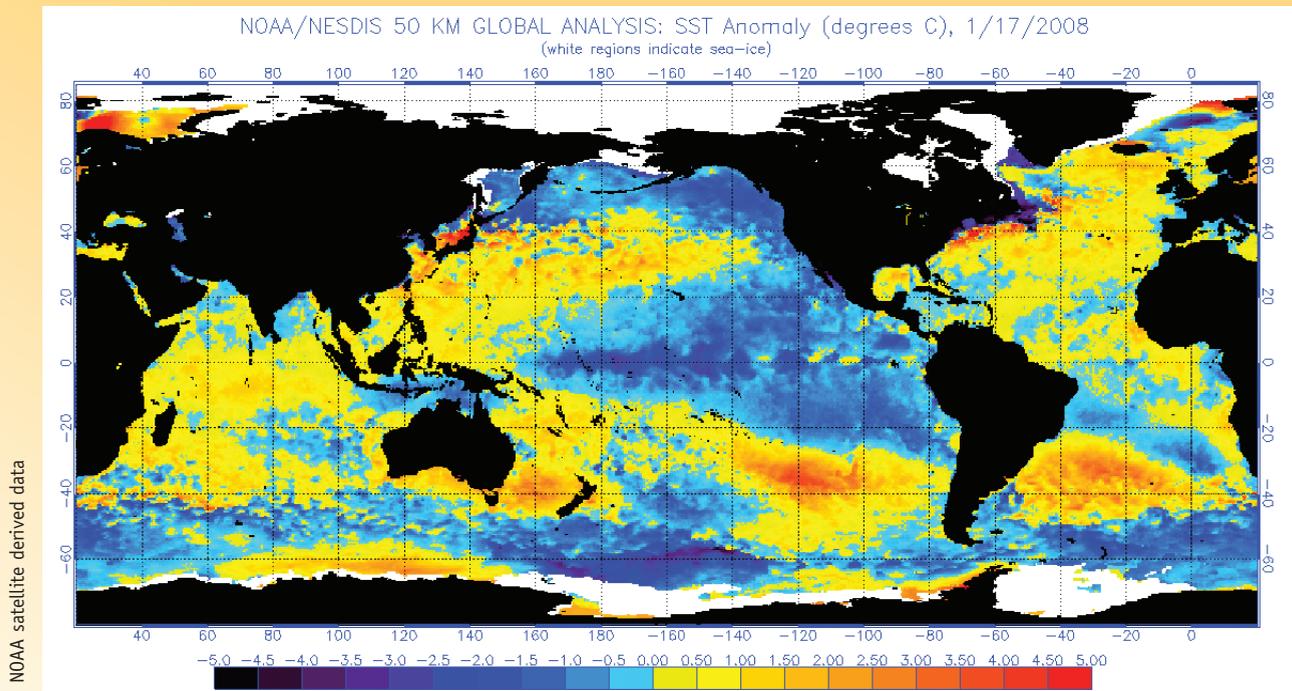
This aspect of the global warming debate is what riles me up the most—there seems to be no willingness to debate. How often have you heard or read, “The science is settled.” As one



Atlantic (AMO) and Pacific (PDO) ocean temperature cycles compared to a running mean of U.S. temperatures.

Courtesy of ICECAP

who has been an observer of the atmosphere for most of my professional life, this statement is absurd. There are many aspects of the interaction between the oceans and the atmosphere as well as the sun and the atmosphere that are poorly understood.



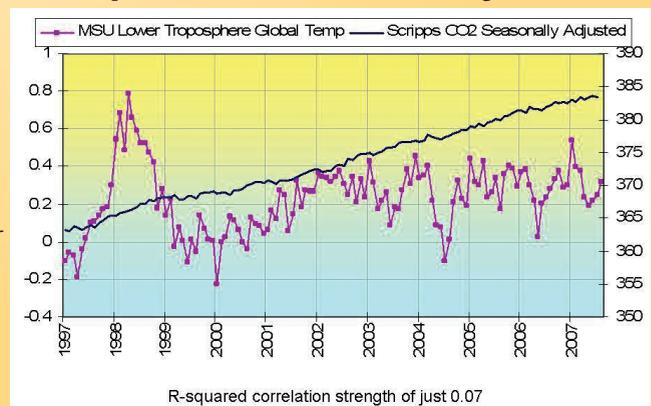
Latest sea surface temperature anomaly. Note the colder than average water through most of the equatorial Pacific and along the West Coast of the United States through the Gulf of Alaska, indicative of a La Nina and cold phase of the PDO.

Another statement you will hear is, "The warming we are experiencing is outside of the realm of natural climate variability." I personally do not agree with this statement. For example, there is evidence to show that the North Atlantic has been as warm as it is now in the recent past. Godthab Nuuk, a village on the southeastern coast of Greenland, was just as warm or warmer as recently as 1940. This warming appears to be related to a recently discovered temperature cycle of the Atlantic Ocean called the Atlantic Multi-decadal Oscillation, or AMO. The North Atlantic was in a warm cycle of the AMO back in 1940. Around 1995, the AMO "flipped" from the cold cycle (that it was in for roughly 30 years starting in 1965) to the warm cycle again. With this warming, there was also an increase in hurricane activity beginning in 1995. Before this, there were a relatively small number of Atlantic storms corresponding to the cold cycle of the AMO.

When a warm cycle of the AMO is combined with a warm cycle of the Pacific (called the Pacific Decadal Oscillation or PDO) good correlation is displayed with warm temperatures in the United States (see figure at left). This makes perfect sense. Right here in Upper Michigan we know how much warmer it is near Lake Superior in the fall than at points inland away from the lake. That is because water holds the summer heat longer than the land. Now imagine two large bodies of water on either side of a relatively small mass of land (compared to the size of the oceans on either side) both in their warm cycles at the same time. The land mass would also be relatively warm. This happened in the 1930s and it

occurred again beginning in the '90s. The Pacific is now undergoing a substantial cooling with one of the strongest La Ninas (cooling of the equatorial Pacific) on record, while the Atlantic is still warmer than average (see satellite image above).

There is no doubt that carbon dioxide (CO₂) is increasing in the atmos-



Carbon dioxide in parts per million, represented by the thin black line, graphed against U.S. temperature anomalies. (Courtesy of ICECAP)

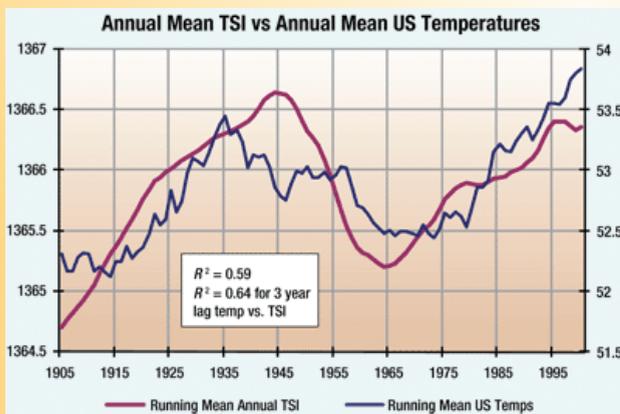
phere and a good share of this increase is from human activity. However, CO₂ is a small constituent of the "greenhouse" gases. Water

vapor (H₂O) is much more plentiful and we produce very little of the total amount. When temperatures over the last decade are graphed with CO₂, correlation strength is very low (see graph on previous page). Correlation does not necessarily mean causation, yet the global temperature pattern since the super El Nino of 1998 has been flat even while CO₂ continues to increase. You can view correlation as circumstantial evidence. The circumstantial evidence for ocean cycles playing a big part in our warming is much stronger than that presented by CO₂.

Another factor in climate variability that cannot be ignored is the role of the sun. Obviously, the sun affects temperature based on the the movement of the earth in relation to it. In addition, the sun goes through a regular series of waxing and waning activity. Astronomers have long known of the sun's 11-year sunspot cycle. During peaks in sunspot

between about 1645 and 1715. This dearth of sunspots, called the Maunder Minimum, presents strong circumstantial evidence for pronounced global cooling during the peak of the "Little Ice Age." Today, astronomers and solar physicists are able to accurately measure solar irradiance—energy received from the sun. Another strong correlation exists between temperature and solar irradiance (see graph below). The earth was bombarded with more of the sun's energy during the last warm spell centered on the 1930s and '40s and, more recently, during the period centered on the '90s. Solar physicists predict a relatively weak sun as the 21st century progresses. Could this mean a period of extended global cooling? Some scientists think so.

Bottom line, climate has been anything but static through time. It is a very complex phenomenon to observe, let alone forecast. A plot of temperatures over time, say



Total solar irradiance (TSI), energy received from the sun, compared to U.S. mean temperatures. (Courtesy of ICECAP)

activity, the sun is more active or "hotter." The record also shows strong evidence of longer-term cycles of the sun. Nineteenth-century astronomers Sporer and Maunder conducted historical searches of sunspot records and found an almost complete absence of sunspot activity

looking at just a 10-year or even a 50-year snapshot of the climate will not help answer the questions as to why we are warming and if we will continue to warm. One climatologist likens our observation of climate to an ant watching the hands of a clock, while he is perhaps perched on the hour

hand. We cannot know exactly where we are, let alone where we are headed.

Studying the past and comparing it to the warming we are now experiencing, I do not believe we are heading for climatic disaster. I do think that, just like our ancestors in the Middle Ages who thought the sun rotated around the earth, we, too, may now be suffering from ego-delusion, thinking we are the primary influence on this planet's climate. Along this same line, there are those who believe we can control the climate and nurture it back to some sort of ideal state. The record shows this idea of an ideal state could not be farther from the truth.

My advice is to be skeptical of future predictions. Next time you are confronted with a story on climate change, be aware of how often you see or hear words like "may," "could" and "if." The climate models that have been developed to project future temperature are not infallible.

Renowned mathematician Jacob Bronowski stated that "no science is immune to the infection of politics and the corruption of power." The science of climate change is no exception—it is a classic example of this fact. Politicians court voters with dubious legislation proposed to solve the "climate crisis." At the same time, scientists who feed at the trough of political favor seek to squelch dissenting opinion from other scientists labeled as "climate change deniers." We need skeptics, because a true scientist is a skeptic. As the late astronomer Carl Sagan noted, "It is the tension between skepticism and creativity that has produced the stunning and unexpected findings of science." Without this doubt, without this admission of uncertainty, climate science will not reach the goal of all science, which is truth. ■