



# THE ATMOSPHERIC RESERVOIR

*Examining the Atmosphere and Atmospheric Resource Management*

## Global Warming: Fact or Fiction?

By Aaron Gilstad

One of the hottest weather topics over the last several years has been that of global warming, but is it really happening?

Over the past several years most North Dakotans would probably say “yes, it’s definitely warmer than normal, especially in recent winters.” That is, at least, until January 2004 when North Dakota saw one of the longest and coldest cold snaps in recent memory. Although most of us would agree that it was overdue, many began to wonder about this global warming phenomenon.

Is global warming really happening? If so, what is causing it? What kind of effect will we see? These are just a few of the questions I have heard in conversations.

In fact, the average global temperature has increased over the past century by approximately 0.45 degrees Celsius (just under a degree Fahrenheit). So, yes, temperatures appear to be rising. But the first thing that people must realize is that, in the grand scheme of things, we are still coming out of an ice age which ended some 10,000 years ago, a recent event in geologic time. Is the increase in temperature a response to this change or to our increasing the greenhouse effect through our addition of carbon dioxide to the atmosphere? No one really knows. Our 125 years of climatological data is just not sufficient to do much more than make inferences.

There are several things that may

cause changes in the global climate. Pollution is one possibility. After all, man has been polluting the atmosphere since his discovery of fire with little regard for the environment until recently.

A recent study by David Fahey at the University in Colorado found that pollution from cars and factories may be thinning cirrus clouds in the upper atmosphere by reducing the number of pure ice crystals that compose them. This could potentially cool the atmosphere by allowing more of Earth’s heat to escape back to space.

In addition to man’s activities, what about natural pollutants? The largest polluter in the United States is the Kilauea Volcano in Hawaii. When Mount Pinatubo exploded in the Philippines in 1991 the pollution it spewed into the atmosphere reduced solar radiation enough to cool the entire Earth by about one degree Fahrenheit.

In addition to pollution, man has intentionally changed the natural environment in reaction to our wants and needs. Recent studies by Dr. Roger Pielke at Colorado State University indicate that changes in land use may be a contributing factor in global change. We build huge cities of asphalt, concrete and steel which create heat islands warmer than the rural surroundings. To provide the foods we desire we plant crops that transpire moisture differently from what once grew naturally. All of these factors, among others, play a role in our changing climate.

We know that man’s activities have the ability to affect weather and climate. The crux of the debate is whether the warming that has been observed in recent decades is being caused or contributed to by man, or is a natural occurrence.

One scenario could be a continued warming, which would melt some of the polar ice caps, raising worldwide sea levels and inundating coastal areas. Evaporation would then increase, creating more clouds, which would then cool the Earth by reducing direct sunlight to the Earth’s surface, possibly culminating in the return to another ice age. Countless other scenarios have also been proposed. No one knows when or if any of them might occur.

In the four-plus billion years that Earth has been in existence it has been in a constant state of flux. Whether through plate tectonics shifts, volcanic activity, ice ages, or the outside influence of asteroid collisions, the Earth’s climate has seen drastic changes, yet continued to maintain life; a dramatic demonstration of the delicate balance of our climate and the resilience of our planet.

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