Global Warming and Montana:

A Survey of the Scientific Literature

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Opening Summary

Thank you very much. I would like to thank the Environmental Quality Council for inviting me to speak here today. I applaud this panel for seeking thorough and comprehensive scientific and economic information prior to making any recommendations regarding global warming.

Now, let's address the science. Scientists know there is no such thing as a "normal" earth temperature. The earth's climate has never been static. Global temperatures are always either rising or cooling. For the past 10 years, temperatures have slightly cooled. For the 20 years prior to that, temperatures were rising. For 30 years prior to that, temperatures cooled. For 90 years before that, temperatures warmed. For several hundred years before that, temperatures cooled.

Moreover, it is worth noting that up until the late 19th century, the planet was in the throes of the Little Ice Age, which entailed the coldest planetary temperatures since the end of the last ice age epoch 10,000 to 15,000 years ago. While global warming alarmists frequently compare current temperatures to those that existed at the end of the Little Ice Age, few will argue that Little Ice Age temperatures were either "normal" or beneficial to human beings and life on planet earth. This is a very important point to keep in mind when presented with the moderate 0.6 degrees Celsius rise in global temperature during the 20th century. The prior Little Ice Age baseline often cited by global warming alarmists was significantly more harmful than beneficial to human welfare and life on planet earth.

It is also important to understand the historic relationship between carbon dioxide and temperature. While it is true that carbon dioxide is a trace atmospheric gas that has greenhouse properties, it has never been the primary driver of climate. As each of the prior speakers will tell you, historically, temperatures have always risen first from natural causes, with carbon dioxide rising, as a result, shortly thereafter. There is no reason to believe that carbon dioxide has suddenly supplanted natural forces as the primary driver of climate. Indeed, let's look at the temperature history of the past 100-plus years.

From 1900 to 1945, greenhouse gas emissions were very minimal, yet temperatures rose dramatically.

From 1945 to 1977, greenhouse gas emissions rose steadily, yet temperatures declined.

From 1977-1998, greenhouse gas emissions and temperatures both rose.

From 1998 to 2007, greenhouse gas emissions rose yet temperatures have slightly cooled.

In summary, **IN ONLY ONE BRIEF, 20-YEAR PERIOD HAVE GREENHOUSE GAS TRENDS MATCHED UP WITH TEMPERATURE TRENDS. AND THAT SHORT PERIOD ENDED 10 YEARS AGO.**

Scientific Consensus

I would next like to address claims by global warming alarmists that all or nearly all scientists agree that human induced global warming is a planetary crisis. Such an assertion is simply not true. More than **17,000** scientists have signed a petition sponsored by a past president of the National Academy of Sciences and co-authored by a professor of astrophysics at Harvard University, stating that scientific

evidence does not support alarmist global warming theory. Also, in a 2006 survey conducted by the National Registry of Environmental Professionals, 41 percent of environmental scientists disagreed that the planet's recent warmth "can be, in large part, attributed to human activity." Moreover, a 2003 survey of more than ***500*** climate scientists conducted by Germany's Institute of Coastal Research found that barely more than half of climate scientists believe human activity is the primary cause of recent climate change. Indeed, more scientists strongly disagreed with this proposition than those who strongly agreed. Additionally, according to the survey, most climate scientists stated that we cannot predict climate conditions either 100 or even 10 years from now. Most climate scientists agreed that global warming will carry some societal benefits. And, importantly, less than half of climate scientists believe that the science has been sufficiently settled to turn the global warming issue over to policymakers, which would presumably include the Montana state legislature.

Additionally, the Russian Academy of Sciences has presented evidence that solar cycles account for most of our recent planetary warming, and that these same solar cycles will usher in a mini ice age within a couple of decades. Scientists with the Danish National Space Center report in a February 2007 article in *Proceedings of the Royal Society Journal A,* "We have the highest solar activity we have had in at least 1,000 years." The scientists add, "The size of man's impact may be much smaller and so the man-made change is happening slower than predicted." And the February 11 *London Telegraph* noted, "There is a growing number of scientists who believe that the effect [reported by the Danish scientists] may be genuine."

Other scientists point out that our current warming is not unique, in that several planets in our solar system are also experiencing significant global warming right now, even though SUVs and coal-fired power plants seem to be mysteriously missing from the Martian landscape. And even alarmist groups such as the United Nations Intergovernmental Panel on Climate Change continue to reduce their global warming predictions with each new climate assessment.

Global Warming Misperceptions

Next I would like to address some of the misperceptions regarding global warming.

MT Temps

Despite what you heard a short while ago, global warming is having minimal impact on Montana and its temperatures. The U.S. Historical Climate Network (know; as the USHCN) maintains 44 temperatures stations across Montana. The vast majority of these temperature stations show essentially stable or cooling temperatures. For example, here, in alphabetical order, are the first 10 Montana temperature stations reported by the USHCN. [Show charts]. Notice the distinct lack of any alarming global warming trend.

To the extent that global warming alarmists may argue that one particular Montana community that is not monitored by USHCN is warming in a rapid manner, it is clear from the extensive, state-wide USHCN data that any such rapid warming in such a single community is clearly an aberration and the exception to the rule. Indeed, with the prevalence of USHCN data showing little if any recent warming in Montana,

one has to reassess the trustworthiness of those who would deliberately present data that so clearly is misrepresentative of state temperatures as a whole.

Of note, here also is Kalispell, which is the temperature station in closest proximity to Glacier National Park. Note that temperatures in the Glacier National Park vicinity are in a long-term cooling trend.

So how can glaciers be melting in Glacier National Park when temperatures are cooling? The answer is that the glaciers in have merely continued the melting that began 150 years ago at the fortuitous conclusion of the Little Ice Age. As an analogy, if you take an ice cube out of the freezer and put it in a 40-degree refrigerator, the ice cube will begin to melt. An hour later, you can reduce the refrigeratcr temperature to 37 degrees, yet the ice cube will still melt in the cooling conditions. The glaciers in Glacier National Park appear to be undergoing the same search for equilibrium since temperatures warmed at the end of the Little Ice Age. And it is important to note here that the conclusion of the Little Ice Age was definitely a positive development for human welfare, even if it means some alpine glaciers are receding as a result.

Indeed, to the extent that global warming is impacting Montana, the effects are primarily beneficial. The U.S. Department of Agriculture reports that crop yields have set numerous records in recent yields. The UN Intergovernmental Panel on Climate Change (known as the IPCC) reports that crop production in the upper Great Plains will benefit rather than suffer from global warming for at least many decades to come. The September 16, 2001, issue of *Journal of Geophysical Research* found an 8-to-12 percent increase in vegetation across North America and Eurasia from 1981-1999. A subsequent comment in *Journal of Geophysical Research* concluded that a concurrent rise in atmospheric carbon dioxide was primarily responsible for the increased vegetation.

Drought

It has also been asserted today that global warming is causing more drought. The scientific data say just the opposite. The July 2004 issue of *International Journal of Climatology* reports, "it is now clear that many places in the Northern Hemisphere, and in Australia, have become less arid," and that "in these places, the terrestrial surface is both warmer and effectively wetter." The study concludes, "a good analogy to describe the changes in these places is that the terrestrial surface is literally becoming more like a gardener's greenhouse."

The May 25 issue of *Geophysical Research Letters* reports that for 20th century soil moisture trends, "An increasing trend is apparent in both model soil moisture and runoff over much of the U.S." The study adds, "This wetting trend is consistent with the general increase in precipitation in the latter half of the 20th century. Droughts have, for the most part, become shorter, less frequent, and cover a smaller portion of the country over the last century."

The National Oceanic and Atmospheric Administration reports, "A number of tree-ring records exist for the last two millennia which suggest that 20th century droughts may be mild when evaluated in the context of this longer time frame." ( )

The July 2007 issue of *Climatic Change* reports that during the Little Ice Age, there occurred three "very large-scale drought[s] more severe and sustained than any witnessed during the period of instrumental weather observations" [i.e., the 20th century].
( )

What we see from the refereed scientific literature is that droughts have definitively become less frequent and less severe during our recent global warming. Asserted trends to the contrary are decidedly short term, limited in geographic reach, and quite minor when compared to droughts that have dominated colder climatic conditions.

Snowpack

It has been asserted that global warming is threatening mountain snowpack. Yet real-world data show that the increased precipitation, including snowfall, associated with the ongoing modest rise in temperatures regenerating rather than shrinking mountain snowpack. For example, *National Geographic* magazine reported on September 11, 2006, that snowpack is growing throughout much of the Himalayas ( ).
Scientists at the University of Washington announced in February 2007 that snowpack in the Cascades have increased during the past 30-plus years ( ). In September 2007 scientists reported that the snowpack at Mt. Shasta has been growing for the last century, including 30 percent growth in the past 50 years
!). And scientists reported in the 2006 *Proceedings of the Western Snow Conference* that alpine snowpack throughout Utah has not declined at all during recent years ( ).
Indeed, in July 2007 the Utah Blue Ribbon scientific panel on climate change concluded that snowpack in the Intermountain West has not been shrinking at all.

Address More Misperceptions Here, As Necessary

Economics

Now even if we are to disregard the science and consider greenhouse gas restrictions, we need to consider whether the benefits of such restrictions outweigh the costs. The answer here is clearly, "no."

Scientists have determined that even if the entire world enacted the Kyoto Protocol, a mere 0.14 degrees Celsius of warming would be mitigated during the upcoming century; an amount that falls within the margin of measuring instrument error.

As for the cost of such nominal temperature mitigation, economists from the prestigious Wharton Business School have concluded that Kyoto would cost the U.S. economy 2.3 percent of its Gross Domestic Product each year. What we now consider to be stagnation would be considered a banner economic year under the Kyoto Protocol.

Indeed, if we are going to take a substantial hunk out of our standard of living to address health and environment problems, we can get far better results by focusing on more serious and scientifically proven problems.

In 2004, the Danish government convened many of the world's leading economists and presented them with this question. Assuming you have access to roughly $50 billion to address global health and environment concerns, where would the money best be spent? From a list of more than a dozen health and environmental issues, the world's leading economists ranked addressing global warming as dead last in terms of benefits accrued per dollar spent, even assuming alarmist global warming scenarios. Significantly, the economists concluded that spending such money on preventing global warming actually did more harm than good, as the benefits that could be achieved did not justify the money spent on mitigating global warming.

Conclusion

Finally, I would like to conclude with a couple of practical matters. Current U.S. policy is in no need of change. Since 2000, the U.S. has been cutting the greenhouse gas intensity of its economy significantly faster than the European Union. Moreover, greenhouse gas emissions are rising much more rapidly in the European Union, China, India, and many other nations than they are in the U.S. By encouraging market forces and research and development rather than implausible mandates, the U.S. is doing more to address greenhouse gas emissions than any other nation in the world.

Indeed, the U.S. is **not** the world's leading emitter of carbon dioxide emissions. China emits the most, the U.S. is second, and India is in third place, rapidly gaining on the U.S. China and India have stated unequivocally that they will not place limits on their greenhouse gas emissions, regardless of what Western nations do. We can cut our emissions all we want, but it will have virtually no impact on global greenhouse gas emissions unless China, India, and other rapidly developing nations do the same. Until and unless we obtain a commitment from such nations to match our efforts, we are merely punishing U.S. citizens, sending jobs and wealth overseas, and slashing our hard-earned standard of living for very little impact on global greenhouse gas emissions. This can hardly be in the best interest of the citizens of Montana.

Moreover, as previously noted, the moderate warming that has occurred in our recovery from the Little Ice Age has brought substantial benefits to human welfare and very little detriment. Global crop yields

are continually setting records, global forests are expanding, deserts are shrinking, and the earth's biosphere is becoming much more robust.

Finally, I wish to point out that I have supported everything I have said today by referencing and quoting from the refereed scientific literature. These are not my personal opinions, but the objective facts gathered by the world's leading scientists, which is objectively verifiable, and published in the refereed scientific literature. There is far more such objective evidence that I could additionally provide if time would have permitted. That being the case, I would be happy to distribute such objective evidence, along with a copy of my remarks, to this committee in written form today if the committee so wishes.

Thank you once again for granting me the opportunity to speak here today.