

The Challenge of Global Warming: Economic Issues for Montana

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Agricultural Economics & Economics

**Mountains
&
Minds**



What is Known And What is Unclear

1. Broad, though not unanimous, consensus among scientists that global warming is at least in part occurring because of green house gas emissions
2. No consensus on the extent to which emissions will increase in the current policy environment.
3. No consensus on the extent to which global warming will raise temperatures over the next 100 years (range in the literature is 1 to 8 degrees F).
4. Non consensus over the speed at which those temperatures will rise and the inter-temporal profile of those changes

What is Known And What is Unclear (cont.)

5. For any given change in average global temperature, there is no consensus among the various climate change models about the implications for the Northern Great Plains. The range is from:
- (a) Warmer and wetter
 - to
 - (b) Warmer and drier

These scenarios imply compellingly different consequences for Montana **agriculture** and Montana **forests** (and the wood products industry).

What is Known And What is Unclear (cont.)

6. There is no consensus about the implications of increased CO₂ concentrations for plant growth and plant yields. Some claim that all yield enhancing effects have already been exhausted. Others disagree.
7. There seems to be relatively little information about underlying longer run trends in the earth's average temperature associated with changes in energy emissions from the sun.

The Information Bottom Line

There is a great deal of uncertainty about:

(a). The global warming process

&

(b). The economic consequences of
any given level of global warming

**So, policy makers really do better
information and that means more
research.**

The Relevant Time Horizon

A Geologist's Perspective:

100 years is the blink of an eye in geological time.

A Climatologist's Perspective:

100 years is a relatively short period of time

An Economist's Perspective:

100 years is a very long period of time, close to an eternity

A Presidential Candidate's Perspective:

100 years from now is an eternity

The Economist's Perspective

A hundred year's ago (1906):

- The average per capita income in the United States was less than \$4,000 in terms of today's dollars.
- Over a third of all U.S. families worried about literally putting food on the table from one day to the next.
- Horse power was the major source of non-human energy on a farm or ranch
- Paved roads were almost non-existent in Montana
- Ipods, pda's, cell phones, CT scans, laser surgery, and commercial flights for all were concepts beyond anyone's imagination

An Economic View of the Pace of Climate Change

1. Climate change is occurring slowly, in terms of how individuals make decisions.
2. The consequences of climate change are occurring slowly.
3. The costs of adjusting to slow change are typically relatively low (note that the key word here is “relatively.”)
4. Most current estimates of the global costs of slowing global warming by slowing down or lowering the rate of GHG emissions are large (both in term of human suffering and dollar estimates of costs), relative to the estimates of the costs of adjusting to the changing environment that would result from living with the consequences of GHG emissions.
5. These estimates do assume that all we have available to deal with GHGs are current technologies.

An Aside on Technical Change and GHG Emissions

1. One way to lower the costs of controlling GHG emissions is to develop new technologies that provide cheaper sources of energy
2. Richard Branson's new research initiative (\$300 million a year for ten years) is apparently targeted entirely towards R&D efforts to develop new energy technologies.
3. As best can be told, the Bush administration's newest global warming \$3 billion proposal has a similar focus.
4. These types of initiative, which involve large investments by the standard of Montana incomes, but modest investments in terms of global economic resources, may or may not be adequate. However, the direction seems reasonable.

Prevention versus Cure?

1. Many environmentalists and scientists were appalled that preventing global warming was not on a recent top ten list of global issues that need urgent policy responses put together by 20 Noble Prize winning economists.
2. It wasn't on their list because obtaining the resources that appear to be needed would undercut efforts needed to deal with other problems that affected far more people far more immediately. And the costs of climate warming appeared to be relatively modest compared to the costs of stopping or reversing the trend.
3. In other words, as with the common cold, they viewed prevention as more costly than cure.

Major Global Human-Related Risk Factors Associated with Global Warming

1. Hunger
2. Disease (Malaria)
3. Water Shortages
4. Coastline change due to rising sea levels

Robin Hoods Bay (Coastline Change)

Coastal Defenses



Now in the Ocean

The Problem



Global Warming Risk Factors for Montana

Water Shortages(?):

Some global climate change models predict a warmer and dryer Montana

- a. Some global climate change models predict a warmer and wetter Montana

Either way, Montana specific research will be needed on plant varieties, alternative crops, range and livestock management, and on hydrological issues.

Either way, Montana's citizens will need accurate information on the path of global warming and policy options and costs

The Policy Role of the Montana Legislature

What should the Montana legislature be doing in terms of policy that requires regulation or tax revenues?

- (1). Publicly funded research: agriculture is an important example
- (2). Provide accurate information about global warming so that people can make effective decisions

The Policy Role of the Federal Government

Everything else that needs to be done

1. Mitigating global warming through limiting GHGs is a national and global regulatory and funding responsibility.
2. Mitigating adverse effects of global warming is also a national and global responsibility.
3. The Montana legislature simply cannot by itself do anything useful in mitigating GHG emissions and reversing global warming trends
4. However, at the last census count, most Montanans were U.S. citizens, paid federal taxes, and had a constitutional right to participate in national politics where policies can be formulated to address global warming issues, and they should.