

Issues in Earth Science

“Topics for Debate”

Issue 1, July 2014

*Global Warming: Can we afford it?*

## **The Price of Global Warming**

by

**Jonathan Chan**



One of the major issues in motivating people to take action against global climate change is its intangible nature. It is easy to confuse climate and weather—there’s always that one guy who debunks global warming because of

a cold day in December. Images of melting icecaps, drought, and flood can be forgotten, as they are happening faraway or, if they are happening here, we adapt and accept the situation. One way to make global climate change real is to frame it in economic terms.

Everyone can understand when something is costing them money, and that paying a little now is better than paying a lot later. So, what is the cost of global warming?

We could use what is known as the hedonic pricing method. This method compares two properties with all things being equal, save for one factor. The cost of that factor can be inferred by the price difference between the two properties. For example, all things being equal, two pieces of land are compared where one is experiencing drought due to rising temperatures. Let's also assume that the price of the land experiencing drought is significantly lower. The difference in the sales price can be argued as the "cost" of global warming. This method has the advantage of being based in hard numbers. Plus, most places keep a public record of property values for tax purposes.

However, this method is fraught with issues. Property markets are prone to bubbles and corruption. Even with those absent, there's the issue of cultural idiosyncrasies driving prices every which way.

The price of food is another possible way to place a price on global climate change. A report by the Intergovernmental Panel on Climate Change found that crop production might fall by two percent a year, every decade for the next century, while demand is expected to rise 14 percent, with a population of 9.6 billion by 2050. The report predicts that carbon dioxide emissions will rise as carbon sinks like forests will need to be felled in order to bring more land into agricultural production.

Is this the method in which to put a price tag of global warming? Everyone eats and food prices have been known to spike during severe heat waves. Yet, even with global temperatures rising, the number of famines has gone down. Norman Borlaug would probably remind you about the Green Revolution, well if he wasn't dead. Borlaug developed a type of dwarfed wheat which now feeds billions of people, especially in India, who otherwise would have starved to death. Necessity is the mother of invention. Even as climate change makes it more difficult to grow crops, our technology may rise to the challenge. On the other hand, we may have to turn our gaze onto ourselves rather than looking to address the world.

As with any complicated question, like global warming, a multi-faceted answer is required. The metrics of which we measure the cost of global climate change from person to person. In the end, everything is worth what its purchaser will pay. The world, however, is priceless.

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**Jon Chan** studied Agricultural Economics with concentration in Environmental Policy at the University of Connecticut. He now works as a journalist for USA Today. He also demands that you have an adequate day.

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**Seed Thesis for “Global Warming” Topic of Debate:**  
(by your friendly editor, Russ Colson):

The idea of human-caused climate change has been politically-charged in the US for the past couple of decades. Even now the idea is not universally accepted among American voters. However, there are several points that I believe are quite certain, scientifically.

## 1) People are influencing climate

People produce carbon dioxide when they burn fossil fuels. It's been known since 1859 that carbon dioxide absorbs infrared radiation (making it a "greenhouse" gas). It's been known since the 1950s that oceans can't completely buffer carbon dioxide concentrations, so pumping carbon dioxide into the atmosphere will increase "greenhouse" warming. Therefore, it seems certain that humans do influence climate.

## 2) People are most likely the major player in the recent warming of Earth.

This is a harder claim to make since there are so many natural causes of climate change (volcanism, variations in Earth's orbital parameters, changes in the sun), and because production of greenhouse gases triggers a complex chain of atmospheric events that can have either warming or cooling effects. For example, increasing temperature increases the solubility of water vapor in air. Water vapor is also a greenhouse gas that causes more

warming, but more water vapor in the air may also produce more clouds that reflect more sunlight, causing cooling.

Complex, but the best efforts to understand the influence of carbon dioxide and all the subsequent events that it triggers suggest that the change in temperature expected for the amount of carbon dioxide that people have already produced is in the same range as the observed changes in world temperature, suggesting that much of the change is human-caused. In addition, the recent increase in Earth's temperature has exceeded the natural variations of the past several tens of thousands of years.

3) Climate change has the potential for significant negative consequences

Considering that temperature often changes by many tens of degrees from one season to another, changes of a few degrees may seem small. However, those few degrees can melt continental ice caps and raise world ocean levels causing flooding of low-lying cities and farming areas. They can change global wind patterns or

ocean currents, possibly increasing or decreasing rainfall in particular areas, causing disruptions in food production. They can cause shifts of climate zones that will disrupt a variety of habitats in unpredictable ways, altering the ecosystems of the Earth of which we are a part and again causing disruptions in food production. Some researchers have pointed out that increasing the ocean temperature increases the energy available to hurricanes or other storms, possibly increasing their severity or frequency.

I'm somewhat skeptical that we can know at this point exactly what problems global warming will cause. But the potential for major problems seems evident, and shouldn't be considered controversial.

4) What to do about global warming is a political, more than a scientific, issue.

Although the Intergovernmental Panel on Climate Change made the statement in 2007 that "We must reduce emissions of greenhouse gases beginning now.", and have reaffirmed this belief more recently, I can't quite agree

that this political action is an inevitable conclusion of scientific study. Science can conclude the pressing potential danger of climate change and cite the high cost to human well-being of not taking action. But taking action to slow or stop climate change also has significant cost in terms of human well-being, and whether taking action or not taking action has the greater cost is, in the end, not completely clear. What's more, which risk that we as a human species choose to shoulder is, in the end, a choice that all people, not just scientists, have to make.

I hope we make that choice with the contributions of earth science exploration in mind.--Dr. C

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Credit: Photo illustration by Russ Colson

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