

Forum

## **Climate science solid, indisputable, so shouldn't we act?**

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There remains a dangerous gulf between scientists' concern about climate change and public understanding. While self-proclaimed "climate skeptics" scoff in the media at the "scientific consensus" as though it is a consensus of opinion, the National Academies of Science of 13 nations -- our leading scientific societies -- call for action based on a consensus of conclusions from almost 200 years of research. We ignore this knowledge at our great peril.

The concept of global warming was proposed in 1896 based upon physical principles discovered earlier in the 19th century. The objective skepticism that is the heart of the scientific process has tested and refined this scientific idea, and its predictions continue to be verified by observations.

Previous generations of scientists predicted that carbon dioxide emissions from burning fossil fuels were building up in the atmosphere, trapping heat, and warming the earth. That these gasses trap heat is basic physics. It is why Venus is hotter than Mercury, though Mercury is closer to the sun. Air bubbles preserved in ancient ice sheets prove we have boosted carbon dioxide concentrations way beyond levels seen in the last 800,000 years. This has altered the earth's energy balance, as documented by air and ocean temperature changes, reduction in ice mass and increase in sea levels.

Science now predicts ever more dangerous and costly changes in coming decades.

"Global warming" does not just mean leaving your sweater at home. The predicted rise in global average temperature by a few degrees will be accompanied by serious and painful impacts to civilization, including changes in distribution of water, more forest fires, acidification of the ocean, more frequent extreme weather events and altered distribution of pests and diseases. These changes will cause vast economic and humanitarian consequences, including mass migrations, threatening U.S. national security. Bakersfield can expect increasingly frequent heat waves, more intense smog and reduced agricultural productivity.

Claims of "no global warming in the last 10 years" are deceptive creations of a temperature record starting in very hot 1998. The last decade was actually the hottest on record. Such cherry picking of data is a favorite tactic used to confuse the public, as is focusing upon a particular place on the planet instead of considering global trends. And don't be fooled by claims the temperature record is influenced by urbanization around weather stations. Not only is this obvious impact measured and controlled for in our records, the largest temperature increases on earth are occurring in nonurban regions of the arctic and the Antarctic Peninsula, just as America's leading scientists predicted in the 1970s.

Similarly, the oft-repeated claim of a scientific consensus for global cooling in the 1970s is not true. Although global cooling attracted much media attention, the vast majority of scientific research at the time continued to point toward planetary warming.

Some folks think that since Earth's temperature has fluctuated in the past, what we're seeing today is probably just another natural cycle. But of the causes of these cycles (variations in the Earth's orbit, changes in solar output and alterations of heat-trapping gas concentrations), only the latter can explain the temperature changes we are measuring. Indeed, global temperatures have risen in the last two decades despite solar energy output being at a recent minimum.

Since carbon dioxide stays in the atmosphere for decades, our past emissions have already committed us to more climate change. Of greatest concern is that we will push the earth's climate across certain tipping points after which massive and possibly rapid change is inevitable.

Fortunately, global warming is a human-caused problem, with achievable solutions. Simple changes in our habits and cost-effective technologies to reduce emissions are available today. Far from hurting our economy, investing in these technologies and promising new ones will provide jobs, develop new domestic industries and keep America competitive in the global economy.

While denial of bad news is human nature, it can be dangerous. Those who continue to deny the facts of climate science are encouraging Americans to confuse the unprecedented with the improbable, and this would be a tragic mistake with devastating consequences.

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