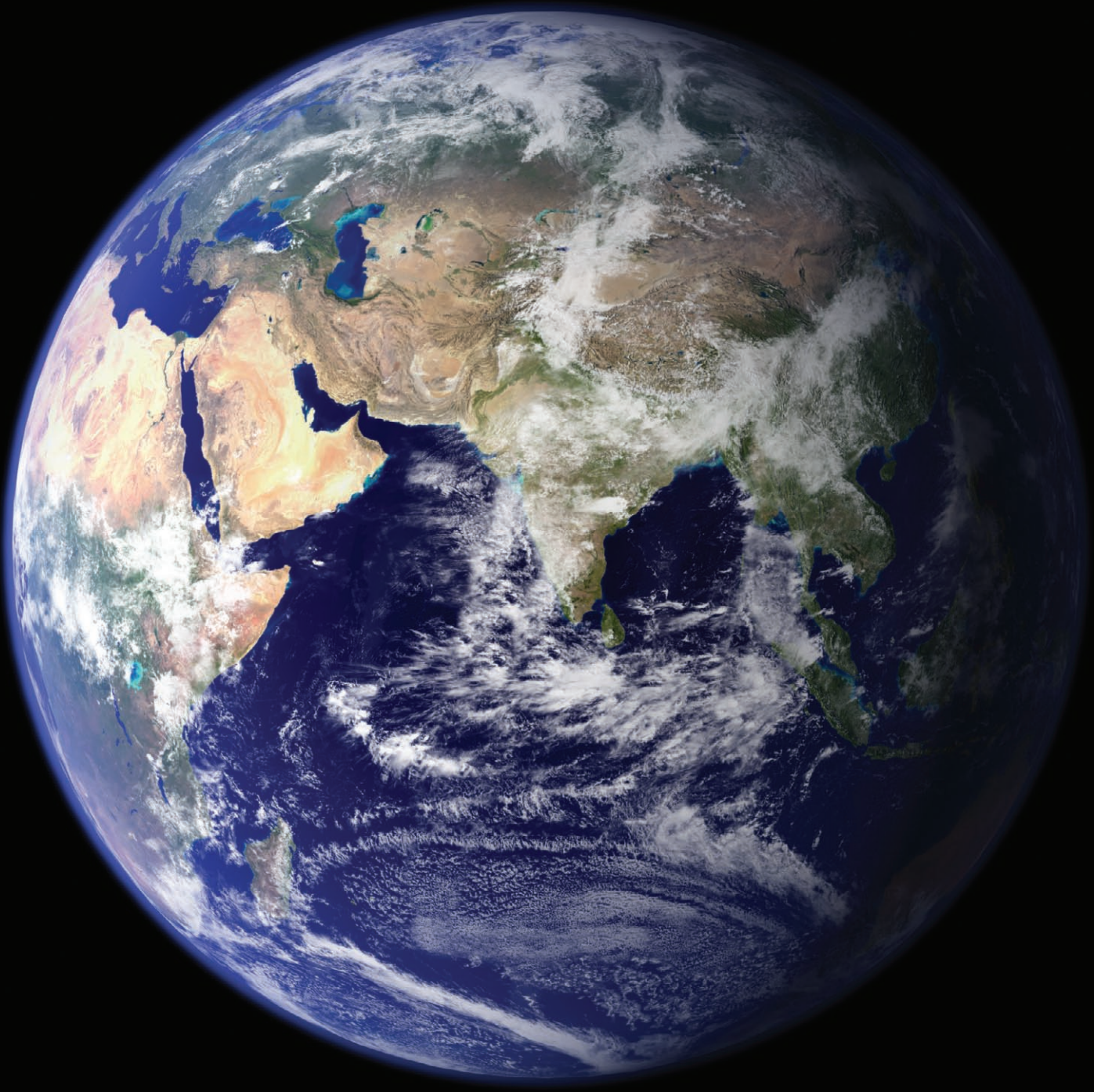

BEYOND GLOBAL WARMING...

NOTED CLIMATE SCIENTIST ROGER PIELKE SR. REJECTS THE NOTION THAT ELEVATED CO_2 LEVELS ARE THE SOLE CULPRITS OF CLIMATE CHANGE.

Roger Pielke Sr. is a retired professor of atmospheric science at Colorado State University, Ft. Collins, and a senior research scientist at the University of Colorado, Boulder. From July 2005 through August 2007, he wrote and maintained Climate Science, a blog that served as a scientific forum for dialogue and commentary on climate issues. With William R. Cotton, he is the co-author of Human Impacts on Weather and Climate *(Cambridge University Press, 2007). And over the past summer he co-hosted a conference entitled "Land Use and Climate Change," in Boulder, Colorado. While Dr. Pielke rejects being characterized as a "global warming skeptic," his work is unwaveringly critical of the current conventional wisdom regarding climate change and what to do about it. AlwaysOn guest blogger Ed Ring recently caught up with Dr. Pielke, who had the following to say on the topic:*

ED RING: How would you say that current conventional wisdom regarding climate change has gotten it wrong?

ROGER PIELKE SR.: In terms of climate change and variability on the regional and local scale, the Intergovernmental Panel on Climate Change (IPCC) reports, the Climate Change Science Program (CCSP) report on surface and tropospheric temperature trends, and the U.S. National Assessment [of Climate Change] have overstated the role of the radiative effect of the anthropogenic increase of carbon dioxide (CO_2) in relation to a diversity of other human climate-forcing mechanisms. Indeed, many research studies incorrectly oversimplify climate change by characterizing it as being dominated by the radiative effect of human-added CO_2. But while prudence suggests that we work to minimize our disturbance of the climate system (since we don't fully understand it), by focusing on just one subset of forcing mechanisms, we end up seriously misleading policymakers as to the most effective way of dealing with our social and environmental vulnerability in the context of the entire spectrum of environmental risks and other threats we face today.

What about experts' predictions of rising sea levels, extreme weather, melting polar ice caps, and so on?

Global and regional climate models have not demonstrated themselves to be skillful predictors of regional and local climate change and variability over multidecadal time scales. For example, in the case of sea ice, the models are consistent with the decrease in Arctic sea ice in recent years, but they cannot explain the multiyear increase in Antarctic sea ice (including a record level this year). With respect to extreme weather, a much more important issue than how greenhouse gases are altering our climate is society's greatly increased vulnerability to extreme weather events—a direct result not of changes in weather but of increased settlement by expanding human populations into low-lying coastal regions, floodplains, and marginal arid land.

But what about the northern icecap shrinking this September to possibly its smallest size in history (exposing more than 1 million square miles of open water) or the comments of Robert Correll, chairman of the Arctic Climate Impact Assessment, regarding recent observations in Greenland ("We have seen a massive acceleration of the speed with which these glaciers are moving into the sea")? Is something new and alarming happening?

These examples represent selected observations that promote the view that human-input carbon dioxide is dominating climate change. However, the climate is—and always will be—changing. Thus, although human activity certainly affects the way in which climate varies and changes, actual global observations present a much more complex picture than that represented by the two examples listed above. For example, Antarctic sea ice reached a record maximum coverage in 2007, and the globally averaged lower atmosphere has not warmed in the last nine years (and, in fact, is cooler than it was in 1998). In addition, there are regions of the world where glaciers are advancing (such as New Zealand, parts of the Himalayas, and Norway). However, this information—which conflicts with the projections of the multi-decadal global climate models and the 2007 IPCC report—has been almost completely ignored by policymakers and the media.

What role have alterations in land use played in climate change?

Changes in land use by humans and the resulting alterations in weather and hydrology are major drivers of long-term regional and global climate patterns—yet the 2007 IPCC Statement for Policymakers largely ignores their importance (despite extensive documentation in research literature). Along with the diverse influences of aerosols on climate, land use effects (caused, for example, by deforestation, desertification, and conversion of land to farming) may be at least as important in altering the weather as the changes in climate patterns associated with the radiative effect of carbon dioxide and other well-mixed greenhouse gases. Moreover, land use and land cover changes will continue to exert an important influence on the Earth's climate for the next century.

The reason for this is that even if the globally averaged surface temperature change over time ends up being close to zero in response to land use and land cover change and variability, the regional changes in surface temperature, precipitation, and other climate metrics could be as large as or larger than those that result from the anthropogenic increase of greenhouse gases. Moreover, people and ecosystems experience the effects of environmental change regionally, not as global averaged values. Thus, the issue of a "discernable human influence on global climate" misses the obvious, in that we have been altering climate by land use and land cover change ever since humans began large-scale alterations of the land surface.

What were the main conclusions to come out of your recent conference focusing on the land use changes that affect the Earth's climate?

This meeting reconfirmed the first-order role of land management as a climate forcing mechanism. These findings supported the conclusions of the 2005 National Research Council report "Radiative Forcing of Climate Change: Expanding the Concept and Addressing Uncertainties," which identified land use change as having a major effect on climate. Unfortunately, the role of land surface processes was underreported in the body of the IPCC report and was essentially ignored in the IPCC Statement for Policymakers.

Sticking with land use changes: Do you think that tropical forests create a thermostatic effect that moderates extreme weather? And following on that, do you think tropical deforestation could be as significant a driver in climate change as anthropogenic CO_2?

Tropical deforestation clearly has an effect on both regional and global climate that is at least as important as the radiative effect of adding CO_2. When forests are removed, not only does the climate system lose the biodiversity and other benefits of that environment, the vegetation loses its ability to dynamically respond in ways that reduce extreme

weather fluctuations. For example, when trees access deeper water through their roots, the resulting transpiration of water vapor into the atmosphere (making rain more likely) can help ameliorate dry conditions when the large-scale weather pattern is one of drought.

What is your criticism of the IPCC?

Mainly the fact that the same individuals who are doing primary research into humans' impact on the climate system are being permitted to lead the assessment of that research. Suppose a group of scientists introduced a drug they claimed could save many lives: There were side effects, of course, but the scientists claimed the drug's benefits far outweighed its risks. If the government then asked these same scientists to form an assessment committee to evaluate their claim (and the committee consisted of colleagues of the scientists who made the original claim as well as the drug's developers), an uproar would occur, and there would be protests. It would represent a clear conflict of interest. Yet this is what has happened with the IPCC process. To date, either few people recognize this conflict, or those that do choose to ignore it because the recommendations of the IPCC fit their policy and political agenda. In either case, scientific rigor has been sacrificed, and poor policy and political decisions will inevitably follow.

How effective are current climate computer models in helping us understand global climate trends?

Using global climate models to improve our understanding of how the system works represents a valuable application of such tools, but the term *sensitivity study* should be used to characterize these assessments. In sensitivity studies, a *subset* of the forcings and/or feedback of the climate system are perturbed to examine their response. Since the computer model of the climate system is incomplete (meaning it doesn't include all of the important feedbacks and forcings), what the IPCC is really doing is conducting a sensitivity study.

The IPCC reports, however, inaccurately present their assessment as a "projection"—one that's widely interpreted by policymakers and others as being able to skillfully forecast the future state of the climate system. But even one of the IPCC's leading authors, Kevin Trenberth, has gone on record reminding people of the limitations of the models used in its projections. Says Trenberth, "There are no predictions by IPCC ... and there never have been." He further states, "None of the models used by IPCC are initialized to the observed state, and none of the climate states in the models correspond even remotely to the current observed climate."

"Scientific rigor has been sacrificed, and poor policy and political decisions will inevitably follow."

—ROGER PIELKE SR.

Indeed, says Trenberth, "The current projection method works to the extent it does because it utilizes differences from one time to another, and the main model bias and systematic errors are thereby subtracted out. This assumes linearity. It works for global forced variations, but it cannot work for many aspects of climate, especially those related to the water cycle."

Thus, as clarified even by one of the key IPCC contributors (who has a vested interest in the acceptance of the 2007 IPCC report), current climate models clearly *cannot* accurately model observed real-world changes in climate. Global model results projected out decades into the future should never be interpreted as skillful forecasts. Instead, they should be interpreted as sensitivity studies on limited variables. When authors of research papers use definitive words (such as "will occur") and display model output with specific time periods in the future, they are misleading policymakers and other people who use this information.

What policies should be considered to deal with climate change? Is reducing CO_2 emissions part of the solution?

Reduction of greenhouse gas emissions can only serve as a useful "environmental currency" as long as it provides the benefits needed to reduce the risk to critical environmental and social resources. As such, it needs to be part of a win-win strategy that provides a diversity of benefits. With energy efficiency and energy independence, for example, everyone benefits. As the "currency" for these benefits, however, greenhouse gas emission reduction represents an unnecessarily blunt instrument if there are more effective ways to reduce the risks to societal and environmental resources. Moreover, greenhouse gas policies can produce serious unintended negative consequences such as an increase in carcinogenic emissions when biodiesel is used, or reductions in biodiversity and alterations in climate when land management practices convert large areas to biofuels.

Greenhouse gas emission reductions, relative to other environmental currencies, should be evaluated with respect to their ability to reduce risk to essential social and environmental resources. In this framework, greenhouse emission reductions are only useful if they provide real benefit to those resources. Thus, if a policy made for other reasons also happens to reduce greenhouse gas emissions, you clearly have a win-win situation. The current focus on using reductions in CO_2 emissions as the primary currency for achieving benefits to society and the environment, however, clearly represents a very flawed approach.

Ed Ring is editor and CEO of EcoWorld (www.ecoworld.com), and has been reporting on clean technology and the status of species and ecosystems since 1995. He can be reached at ed@ecoworld.com.