# Are we asking the wrong questions about global warming?

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Public discussion over global warming is often caught in a vortex of misinformation perpetuated by extreme forces who say it's all just a big hoax.

This often causes the most relevant scientific questions to get lost, suggests Washington state climatologist Philip Mote, who has been working for years to understand climate changes brought about by human activity.

What we should be talking about when we talk about climate change, Mote suggests, is no longer if it is occurring but how and where. Further, what lasting impacts climate change will have upon individual regions like the Pacific Northwest, and most important, what can we do about it"

Next week Mote, who is one of the lead authors of the recently released Fourth Assessment Report of the Intergovernmental Panel on Climate Change, will deliver a public lecture on these questions at the AVS 54th International Symposium & Exhibition in Seattle. The lecture is free and open to the public.

"Climate change is real and it is a problem," says Mote, a researcher with the University of Washington Climate Impacts Group. "It's going to exacerbate all sorts of economic and environmental problems, and in the next few decades we could be determining events that will happen thousands of years from now."

In his lecture, Mote will examine the science of climatology and how climate changes are tracked—through monitoring sea levels, snowfall, tree rings, coral reef kills, satellite images, and other year-to-year measurements. He will also discuss possible technological fixes and other solutions—from the legitimate to the loony.

Mote has spent years tracking climate trends in the Pacific Northwest—roughly the Columbia river basin, which encompasses most of Washington State, Oregon, Idaho, and a large part of British Columbia. He and his colleagues look specifically at the annual mountain snowpack, which is determined by the weight of a sample of snow taken from a carefully selected spot each year on April 1st, when the snow is at its thickest.

The U.S. Department of Agriculture (USDA) has been collecting such snow cores every year at more than a thousand locations scattered around the west for decades because nothing is more relevant to the agriculture of the Pacific Northwest than winter snowfall. As the heat returns to the mountains in the spring and the snow melts, the runoff feeds the region's streams and rivers. Such stream water is the lifeblood of agriculture in the west, where surface sources provide most of the region's freshwater.

But the snowpack samples are also something more. They provide a climate record of the mountains because some of the sites have been operating for half a century. And the climate record shows declines in annual snowpack in many of the locations where snow cores are collected. As the snowfall decreases, the runoff volume is less, which means less water is available.

How much this change is directly attributable to greenhouse gas emissions is an issue that is still being studied by climate researchers. Some snow disappears for reasons other than global warming. In fact, Mote recently analyzed the glacial retreat atop East Africa's Mt.

Kilimanjaro and determined that it is not linked to global warming. The temperatures there rarely rise above freezing, even in the summer, and the declines started before the beginning of the 20th century. In fact the only thing that could save the snows of Kilimanjaro, he says, could be global warming. More frequent snowfall would change the reflective nature of Kilimanjaro's snow, altering its energy absorption and causing it to disappear more slowly.

This in no way means that climate change in the Pacific Northwest is not real. The annual snowfall declines in the mountains around the Columbia River valley are reflected in the data and are clearly linked to increased temperatures, says Mote. But researchers are still learning more about the causes of the increased temperatures.

As for what to do about the problem, Mote remains optimistic that a solution can be had, though he doubts we can solely count on a technological solution. A cautious reading of the history of large-scale human interventions in climate is not terribly promising, he says.

More likely a workable solution would be a multifarious approach implementing changes in global patterns of fuel consumption, carbon output, emissions, and energy usage. Such an approach is doable, but it would require a massive global effort by governments, industry, and consumers and demand a rare combination of political will, technological innovation, and public support.

Still, Mote says, "All solutions applied vigorously could get us there."

Source: American Institute of Physics