

First Oregon climate model sobering

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For The Register-Guard

Published: Jan 12, 2009 09:10AM
Opinion: Editorials & Letters: Story

The recent snow and cold make it difficult to think about climate change. But the climate is changing, global mean temperatures are rising, and Oregon is already feeling the effects. We must begin to prepare for the consequences.

The 2007 Intergovernmental Panel on Climate Change projected that global mean temperatures would increase at least 2 degrees Fahrenheit, and possibly as much as 11.5 degrees, by the end of the century.

What will this mean for Oregon?

My program at the University of Oregon seeks to answer this question. We started by assessing the effects of climate change in the Rogue River Basin.

With assistance from the Mapped Atmosphere- - Plant-Soil System Study team at the U.S. Forest Service's Pacific Northwest Research Station, we began by downscaling three global climate models used by the IPCC to the Rogue basin. We used the panel's "high emissions" scenario for this purpose because the world currently emits greenhouse gases at (actually above) this rate.

Panels of scientists and policy experts examined the downscaled data and assessed the likely consequences for the environment, as well as for buildings and infrastructure, human health and economic systems in the Rogue. Recommendations were then offered for preparing those systems to withstand and adapt to those effects.

Each of the climate models predicted that temperatures in the basin will rise by between 1 degree to 3 degrees by about 2040 and 4 degrees to 8 degrees by 2080. The summers already can be hot in

the Rogue, and they appear primed to get even warmer — with summer temperatures 7 degrees higher by 2040 and up to 15 degrees higher than they are today by 2080.

While the models predict that total precipitation might stay roughly the same, more rain is projected to come in midwinter. The Rogue basin is also likely to experience longer periods of drought.

Rising temperatures are projected to decrease the snowpack by between 25 percent and 75 percent by 2040, and by another 25 percent to 75 percent by 2080. Snowmelt also would occur earlier in the spring. The result would be low stream flows extending well beyond summer months.

The models project more severe winter and spring wind, rainstorms and flooding. Hotter temperatures and reduced snowpack are projected to significantly increase the size and frequency of wildfires. A major vegetation shift from fir to hardwood trees seems likely, driven largely by fire.

The projections could be wrong. But the climate models have tracked historical temperature patterns very well and represent the best available scientific data. They suggest that the overall trends are likely to hold even if some of the details are off.

The ecological changes would affect people in the basin significantly. Floods and wildfires are likely to produce millions of dollars in direct damage to buildings and infrastructure built on floodplains and in steep, forested canyons.

Roads likely would be damaged by more frequent storms, flooding and wildfires, affecting the movement of goods, people and emergency responders.

Agriculture could be hard hit, including the vineyards that produce many of Oregon's prized wines. The region's famed pear crops are very sensitive to temperature variations and may need to relocate toward the coast or northward.

Personal health would be affected by more heat-related illnesses and rising risk of Lyme disease and West Nile virus. More smoke from wildfires would aggravate asthma.

After considering the projected effects, the policy teams said that climate preparation should become a top priority. Three overall steps were recommended.

The first is to analyze potential vulnerabilities. Public and private organizations should analyze how climate change might affect their buildings, energy supplies, insurance, work force, transportation networks, constituents or customers, and other issues.

Second, because the future shaped by climate change will not look like the past, planning and decision-making should begin to focus on the likely future range of climate variability rather than the traditional approach of basing plans on historic patterns.

Lastly, to respond effectively to the novel challenges, new and expanded forms of governance will be needed. This means gathering new types of information, allocating staff, equipment and other resources in different ways, and adopting decision-making mechanisms that are more responsive to rapid change.

An important message from the assessment is that anticipatory steps to prepare for climate change can provide multiple benefits. In contrast, responding to climate impacts after they occur would be extremely costly.

Preventing further development in high-risk floodplains, for example, would avoid millions of dollars in damage while also increasing the capacity of streams to hold and make water available in times of drought. Reducing local emissions would help resolve climate change and reduce the risk of asthma.

The Rogue assessment shows that climate change poses serious risks to Oregon. In February, we will release a study of the upper Willamette basin, including the Eugene-Springfield area.

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