

Toasty Times: What Will Happen To Oregon as the Earth Heats Up?

by Valerie J. Brown

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...And God said to Noah^{1/2}"Make yourself an ark of gopherwood^{1/2}and all the fountains of the great deep burst forth, and the windows of the heavens were opened."

- Genesis 6:14, 17; 7:11

At least Noah had a clear statement from an authoritative source. But 21st-century humans face a more complex dilemma in the specter of climate change. The majority of the world's climate scientists (but not all-see sidebar) say the global climate is warming at an accelerating rate, recently measured at about 4 degrees Fahrenheit per 100 years, and that it is at least partly our fault. Our use of fossil fuels and our removal of the world's trees are expected to double the pre-industrial level of carbon dioxide (CO₂), a major greenhouse gas (GHG), in the atmosphere by 2003.

In 1995, the Intergovernmental Panel on Climate Change (IPCC), consisting of the world's leading climate scientists, stated that human activity is contributing to atmospheric warming. Yet public debate in the U.S. has revolved, not around what to do about climate change, but whether it is real. The Kyoto Protocol, an international agreement to reduce greenhouse emissions, has been signed by the Clinton administration but not ratified by the Senate. Senate reluctance and public complacency stem in part from a multibillion-dollar disinformation campaign conducted by the oil and coal industries, detailed in Ross Gelbspan's 1998 book *The Heat Is On The Climate Crisis, the Cover-Up, the Prescription*.

But as the weight of evidence grows, we may finally be coming to terms with it. The likely impacts of global climate change are being evaluated by the National Assessment of the Impacts of Climate Variability and Change for the U.S. (National Assessment). The final report addressing five sectors - forests, water resources, health, coastal ecosystems and agriculture - will be delivered to the president in June.

Oregon has plenty at stake. "Higher temperatures will lead to less snowfall and earlier snowmelt and runoff," says Peter Gleick, the National Assessment's water sector co-chair. West of the Cascades, warming at first will mean more rain-on-snow flooding of the type that hit Oregon hard in 1996, but, as the snow-covered area decreases, says University of Washington atmospheric scientist Philip Mote, rain-on-snow flooding is much less likely. The worst problem is going to be a significant drop in water available for agriculture and urban use in the summer.

The Pacific Northwest National Laboratory (PNNL) in Richland, Wash. has developed a regional climate change model. PNNL researchers predict that a doubling of atmospheric CO₂ by around 2050 will produce a 2-5 degree Fahrenheit temperature rise in the Northwest. The increase will be larger in summer than in winter and larger at higher elevations than lower ones. The average snowline is expected to move from the current 3,000 feet to 4,000 feet by 2050. In a 22nd-century Oregon, skiing, salmon and trout fishing, and other recreations may become just bittersweet memories.

"We feel reasonably confident that agriculture does pretty well with elevated CO₂," says U.S. Forest Service bioclimatologist Ron Neilson. After all, as greenhouse optimists like to emphasize, plants love the stuff. The Willamette Valley will probably see a longer growing season and increased yields. On the east side, PNNL predicts that wheat farmers will likely see a slight net increase in wheat productivity.

But Neilson emphasizes that the agricultural benefit may be only temporary, and only if temperatures do not rise past the plants' heat tolerance limits. For the Columbia River Basin, a PNNL "middle-of-the-road" scenario predicts that the current odds of drought (four in 40 years) will double by 2020 to eight in 40 years and triple by 2050.

Trees "are our biggest uncertainty," Neilson says. The timber industry may see at least a short-term benefit. West of the Cascades, lower-elevation forests will benefit, but the Western U.S. may lose all its alpine forests by 2100, according to the National Assessment. The relationship between temperature and moisture is critical. On the east side, according to the PNNL research, big trees can probably withstand climate stress fairly well, but seedlings will have trouble getting established in a drier climate. There may be flood-and-drought cycles that will first increase vegetation and then dry it out, making forests more vulnerable to insects and fires.

The National Assessment expects the Pacific Northwest to escape the worst of the potential health consequences of climate change, but some possibilities are nevertheless important to consider.

Warmer temperatures and more precipitation encourage creatures whose response to environmental change is a population explosion. These include weeds, insects, rodents, fungi, protozoa, bacteria and viruses. The IPCC projects that with a three to five degree Fahrenheit temperature increase, the "zone of potential malaria transmission" will include 60 percent of the world's population by 2100. Heavy rainfall also increases turbidity and washes livestock dung into streams, raising risks of human exposure to cryptosporidia and E. coli. It may stir up toxic sediments. Higher temperatures increase pollen counts, further stressing people with respiratory problems. In warming coastal waters, algae blooms and subsequent toxic shellfish events may increase. On the positive side, cold-related deaths will probably decrease, especially east of the Cascades.

A little research shows that Oregonians are not prepared to face these developments. Even though many citizens and government officials privately confess to climate anxiety, state and local governments have not taken many steps to prepare for significant climate change. In 1988, Neil Goldschmidt created the Governor's Task Force on Global Warming. In 1997, after nine years of policy development, Oregon adopted the nation's strongest CO2 emissions standards for new energy facilities. Other than that, according to Sam Sadler of the Oregon Office of Energy, the state's climate change actions are "more a matter of watching at the moment than beginning to make plans for adaptation."

The Oregon Department of Transportation (ODOT), which will bear serious burdens under even mild climate change scenarios, has done even less. According to Mike Long, ODOT Geo/Hydro Section Manager, ODOT's planning efforts have been "in response to the aging infrastructure" and "observed increase in the frequency of large storm-event-related slope failures in the last five years, as well as in response to worries about a subduction earthquake with tsunami. Climate change is simply not on ODOT's radar screen, despite strong hints from floods and landslides we've already had.

Likewise, Eugene Water and Electric Board's preparation for climate consequences has been basically passive. EWEB's vision focuses mostly on the next five to 10 years, with 20 years as its longest view, according to Jim Maloney, the utility's Resource Planning Analyst. A 1996 citizen involvement committee pressed EWEB to reduce GHG emissions, and EWEB is working steadily toward using more renewable resources such as wind, geothermal and photovoltaic projects. While the EWEB Board of Directors is aware of climate change, Maloney says, "Currently we don't have any kind of formal position on global warming."

Increased precipitation will raise peak and possibly average levels of the Willamette and McKenzie Rivers, along with smaller streams such as Amazon Creek. For its assessments of flood risk, the City of Eugene relies on the Federal Emergency Management Agency (FEMA). According to City Public Works Department spokesman Eric Jones, studies of the Willamette River basin do "not directly model macroclimatic factors such as global warming." Jones says that dams upstream of Eugene kept the Willamette from flooding in 1996 when the city received nine inches of rain in less than a week, implying that the system can handle wide climatic fluctuations.

Yet climate change is not simply bad weather. As KEZI meteorologist John Fischer points out, it's not so much extreme events as subtle things like the upward migration of temperatures over time, and the growing season gradually lengthening, rather than something people can

observe directly. Despite the millions the fossil fuels industries have spent trying to discredit "doom-and-gloomers," the public is actually quite concerned. Fischer says at his speaking engagements, the first question people ask is "What's it going to be like this weekend?" and the second is "What's global warming going to be like for us?"

A 1997 National Science Foundation survey found that 75 percent of Americans believe global warming is real, human caused, and bad. Eighty-eight percent said the government should regulate air pollution by business, and sea level rise was the impact of most concern. Paradoxically, the number of people who worry about global warming dropped between 1989 and 1997. A 1999 American Geophysical Union report suggested this was because people also believe the underlying cause of global warming is "human greed and moral corruption" and that the problem seems "intractable" because effective solutions would be too hard to implement.

However, most skeptics and believers alike agree that we ought to take the "no regrets" steps such as reducing fossil fuel use and reevaluating our land use practices whether or not we know for sure that the climate is changing or that such change is the result of human activity. Even Oregon's prime skeptic, State Climatologist George Taylor (see sidebar), is a vegetarian and rides his bike to work because he wants to tread more lightly as a matter of principle. Yet such incremental individual actions should be a complement to strong public policy actions, which the U.S. has been loath to adopt. Society will probably remain "in denial until it's undeniably bad," says Maloney.

But the tide may be turning, even in corporate America. The Global Climate Coalition, a group of large corporations resistant to governmental interventions, has begun to lose some of its most visible members, including the Ford Motor Company, General Motors and Daimler-Chrysler. These defections may lead to a crumbling of resistance among moderates, such as we have seen in the tobacco industry, leaving the most strident skeptics even more marginalized.

Even the larger corporations now softening their stances may be realizing that climate change has a moral dimension. There are nations in this world consisting entirely of low-lying islands, and those islands are swamping at an alarming rate. In Bangladesh, one meter of sea level rise will displace 13 million people. After the devastating rains from Hurricane Mitch, the number of migrants trying to get across the Texas-Mexico border increased fivefold, according to Jonathan Patz of Johns Hopkins University. The recent Venezuelan mudslides and the Mozambique floods may be climate change in the flesh, and what each of us does today may add to the suffering and destruction of others tomorrow, including that of our own children.

Laura Westra, an ethicist at Sarah Lawrence College, says the post-World War II trials of Nazi functionaries in Nuremberg, Germany established that inaction is a form of harm. She asserts that the world's privileged people are committing crimes of acquiescence and obedience to corporate interests on climate change issues. Even if the developed world shrugs its shoulders and escapes the worst consequences of climate change, it still ought to consider that there may be a violent backlash when the privileged continue to find seats on the ark while their unlucky brethren struggle to hold their heads above the flood.

Sidebar 1: Skeptics or Believers?

Climate change is studied in two main ways - by creating models and by looking at historical data. It is also funded in two main ways - by governmental (usually federal) money and by special interest groups and non-profit organizations. According to Oregon State Climatologist George Taylor, those whose work is federally funded tend to be climate change believers who use models, and those who are skeptical find access to federal money difficult. Of course modelers' results show climate change, he says, because if they didn't, their money would dry up.

For their part, believers say few skeptics are actively researching climate change and

publishing their results in peer-reviewed scientific journals and that most of their work consists of policy statements for conservative political and industry groups. Three different declarations (the Leipzig Declaration, the Heidelberg Appeal and the Oregon Institute for Science and Medicine's Global Warming Petition) are cited by skeptics as evidence that thousands of credentialed scientists are skeptical about climate change. However, the vast majority of those signatories who are identified by specialty are not climate experts. - VJB

Sidebar 2: A Beltway Perspective

The U.S. House of Representatives has a poor track record of acknowledging the reality of climate change. According to Ross Gelbspan, author of *The Heat Is On: The Climate Crisis, The Coverup, The Prescription*, hearings in 1995 chaired by Dana Rohrabacher (R-California) were an exercise in denial.

Oregon Congressman Peter DeFazio, who believes the "preponderance of science" proves climate change is real, said in a March 28 telephone interview, "Basically the House is run by the 'Flat Earth Society' and they don't believe in global change. The controlling party of Congress inside the Beltway is listening to the three or four industry scientists who are saying there's no problem." Although it's the Senate that needs to ratify the Kyoto Protocol as a treaty (see main article), DeFazio believes the issue should be thoroughly debated in both houses.

DeFazio said the U.S. is an embarrassment internationally on the issue of climate change. At a recent meeting in Buenos Aires of the countries who have signed the Kyoto Protocol, DeFazio said the attitude of the Republican-controlled delegation was "worse than the Chinese, who say they believe in global warming but they aren't going to do anything about it."

The attitude of federal politicians doesn't mean nothing can be done about climate change at the state and local levels, DeFazio said. "I think the public is way ahead of the elected officials on this," he said. He believes Oregonians are interested in creating truly "environmentally friendly" lifestyles. He may be slightly optimistic, since sport utility vehicles (aka "light trucks") are the best-selling motor vehicles in the state and the average SUV, according to EPA figures, emits 16,800 pounds of CO2 annually, compared with 10,000 for the average passenger car.

DeFazio thinks members of oil and coal industry action groups should be encouraged to cross over to the other side of the debate, following the example of the Ford Motor Company, General Motors and BP Amoco among others who have left the Global Climate Coalition. DeFazio said when he spoke to a meeting of industrial corporations and the National Association of Manufacturers, he argued that there are ways to make money on energy efficiency" and encouraged the group to split from the "dirty industries who are going to fight to the bitter end."

As to chances of a policy shift with the November elections, DeFazio said the presidential choice this year is pretty obvious. "We're choosing between a guy who represents the oil patch and someone who might take a leadership role on the issue."

--VJB

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