Climate Change Is Really Bugging Our Forests

By Paul R. Epstein and Gary M. Tabor

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As lightning continues to ignite wildfires across the parched North American West, an unseen armada of beetles, encouraged by warming, burrows beneath the bark of drought-weakened trees, killing vast stands rapidly and transforming them into kindling. Together, climatic extremes and the pests they foster are stalking our nation's forests, threatening habitat, wildlife and even human health.

President Bush has proposed a Healthy Forests Initiative to combat the danger of wildfires. But no effort at restoring the soundness of our forests can succeed in the face of global warming and the accompanying intensification of weather extremes, which encourage the infestations and conflagrations, unless it includes a clean energy policy aimed at stabilizing the climate.

In July, the U.N. World Meteorological Organization affirmed that warming of the atmosphere and deep oceans is intensifying droughts, along with heat waves and floods, worldwide. The prolonged droughts in the U.S. West are part of this phenomenon and are directly attributable to anomalous sea surface temperatures in the Pacific Ocean.

As the earth's surfaces warm, evaporation is drying out forests and soils, increasing susceptibility to fire. Last summer, more than 7.3 million acres of U.S. forests burned during an intense drought. This year, there have been more than 800 separate fires in British Columbia; Oregon has seen fires lay waste to pristine areas; and wildfires have sent haze billowing from Arizona to Montana.

Most alarmingly, as an intergovernmental panel concluded in 2001, earth's biological systems are already responding to climate change. The current epidemic of bark beetles adds a new dimension to the risk of fires. In just the past few years, bark beetles have damaged forests in Arizona, New Mexico, southern California, Wyoming, Montana, Idaho, Washington, Oregon,

Alaska and British Columbia. In British Columbia, nearly 22 million acres of lodgepole pine have become infested -- enough timber to supply the entire U.S. housing market for two years.

Mountain bark beetles (Dendroctonus ponderosae) attack lodgepole, ponderosa, Douglass fir, sugar and western white pines, destroying them by injecting a fungus. The galleries of eggs they lay inside the bark pave the way for the trees' death within a year. Healthy trees secrete pitch to drown the invaders and plug the holes they bore, but drought dries out the pitch. Woodpeckers and nuthatches keep adult numbers in check, but with warmer winters, beetle populations can quadruple in a year, outpacing their pursuers. Warming is increasing the reproduction, abundance and geographic range of beetles, destabilizing the age-old, hard-won truce between insects and vegetation. Since 1994, mild winters in Wyoming have helped the beetle larvae survive the season. Usually, 80 percent die, but the mortality rate has dropped to less than 10 percent. In Alaska, spruce bark beetles are sneaking in an extra generation a year due to warming, and have denuded 4 million acres in the Kenai Peninsula in the past five years. "This is another example of global climate change that has deadly implications for my state," declared Alaska's Republican Sen. Ted Stevens last year.

Warming is also expanding the beetles' range into higher altitudes. In the past four or five years, they have begun to attack whitebark pines at an elevation of 8,000 feet or higher. Jesse Logan, who works for the Utah Forest Service, told the Billings (Mont.) Gazette last month that this development coincides with an overall warming trend that began in the 1980s. "Beetles are cold-blooded, so their metabolism is related to the environment they're in," according to Logan, who said the beetles seem to be a reliable indicator of global climate change. "Taken all together, it becomes a pretty compelling story, and a scary story to me."

Wildfires are hazardous to people, wildlife and property. Beyond the immediate danger of the fire itself, particles and chemicals from blazes cause heart and lung disease, and the hazes can carry thousands of miles. Last summer's Hayman fire in Colorado left lingering respiratory illnesses, and after the 1998 fires in Florida, complaints of asthma increased by 91 percent, bronchitis by 132 percent and chest pain by 37 percent.

Not all forest fires, of course, should be suppressed. Periodic fires help rejuvenate forests. But the drought- and beetle-driven wildfires today are not

self-limiting, and the underlying causes must be addressed. Unfortunately, little can be done directly to control bark beetles. Pesticides, which enter ground water, are only somewhat effective and must be applied widely long before the beetles awaken in spring. The president proposes thinning forests to reduce the threat of fire. But the extensive logging and clear-cutting that would be allowed under the Bush administration's initiative is a practice that damages soils, increases sedimentation, reduces water-holding capacity and dries up rivers and streams -- all increasing susceptibility to pests and fires. Even the best forest practices, however, will be insufficient to stem the ravages of drought and the onslaught of beetles. Forests plagued by wildfire and beetles need moisture.

Just as we underestimated the rate at which the climate would change, we have underestimated the biological responses to warming and the costs associated with the accompanying weather extremes. Climate change is weakening the hosts and emboldening the pests. If we are serious about protecting the world's forests, we must embark upon a comprehensive program to stabilize the climate by burning far less fossil fuel, adopting energy efficiencies and smart technology, and felling far fewer trees, which absorb heat-trapping carbon dioxide. And the sooner we do it, the better.

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