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A Hit Where It Hurts

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A Hit Where It Hurts

Biologists of many persuasions are now grappling with the difficult problem of identifying the effects of climate change on species of all types. The direct effects of shifting temperature regimes are in principle the simplest to detect, and many apparent instances of climate-related changes in the ranges of both animals and plants have now been found. But the possibility of indirect effects—in which the response of one species to a climate trend in turn affects a different species—has always loomed large. Researchers are increasingly looking for such influences.

The article that begins on page 761, by Alex Woods and colleagues, provides a good example. The study describes strong evidence for an indirect climate effect on plantations of an economically important tree species. In the northwestern part of British Columbia, mature lodgepole pines, used in construction and for pulp, are losing their needles and dying because of blight caused by the fungus *Dothistroma septosporum.* Woods and colleagues believe this to be a globally unprecedented occurrence. The fungus has long been recognized as a pathogen of pines, but although it is a serious disease of exotic plantations in the Southern Hemisphere, it has heretofore been considered a minor threat to northern temperate forests. Why, Woods and colleagues wondered, has *Dothistroma* turned lethal on a large scale?

Their investigation of climate records led them to the conclusion that warming per se has not occurred in the affected areas over the relevant time period. The records did, however, reveal a clear local increase in summer precipitation over the past decade. That constitutes a smoking gun, because *Dothistroma*'s life cycle depends on summer moisture for spore distribution. The increase in precipitation had no clear link to the Pacific Decadal Oscillation, a fluctuation of the ocean surface's temperature that might have explained it. The authors conclude that the increase in precipitation is most likely related to a directional climate trend.

Biologists might keep in mind this compelling illustration of an unanticipated consequence of climate change—an increase in summer precipitation might have been expected to benefit the pines—because it emphasizes the need for more research into such effects. By damaging logging companies' interests, the *Dothistroma* epidemic could reinforce an intriguing political shift. President Bush, whose administration has sometimes seemed more sympathetic to logging companies than to scientists, has recently (and belatedly) acknowledged that greenhouse gas emissions are creating a long-term problem. And some in Congress who were not previously impressed by the urgency of tackling global warming have been more attentive in recent weeks. The energy bill signed by the president last month—which makes a start on some measures that should slow the US growth in fossil fuel consumption—is also progress of a sort, despite its failure to require stricter vehicle efficiency standards.

Although US support for studies on climate change falls short of the level most scientists would consider justifiable, the scientific message is apparently now being heard a little better than it was a few years ago. A blow to the wallet gets attention. If biologists can provide additional convincing demonstrations of climate change impacts on economic interests—direct or indirect—they might find more people listening who are willing to take action.

TIMOTHY M. BEARDSLEY
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