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Heated Dilemmas

As hurricane season commences on the East Coast and the West Coast heads into fire season, there's no time like the present to consider the short- and long-term effects of responses to disasters being shaped by the climate of a warming Earth. Are we doing enough to ensure our future well-being in the face of climate change, or are we too distracted by intense but relatively infrequent disasters such as fire and flood to contemplate the big-picture changes we need to make?

It's a difficult question that researchers at UC Santa Barbara and the University of Washington are now trying to answer. The multidisciplinary team contends that short-term management responses to disasters "may be inefficient and even maladaptive in the long term." Their paper, "The dangers of disaster-driven responses to climate change," is published in the journal Nature Climate Change.

The group's concept is derived from salience theory, which predicts that people are more likely to respond directly and specifically to events that stand out more to them — such as the acute experiences of being in a disaster — than they are to less vivid but no less significant phenomena. This often results in immediate responses with unintended consequences.

"What tends to happen is that after a wildfire, for instance, the government responds by placing more fuels management projects intended to reduce the risk of future fire near the community that experienced the wildfire," said Sarah Anderson, an associate professor in the Bren School of Environmental Science & Management, and lead author of the paper. "But, given that the fire likely already reduced fire risk

in that area, it might have been better to take those actions elsewhere.” The resulting lack of resources to reduce the buildup of fuel in other, similarly fire-prone areas could increase the risk of wildfires that already is elevated by a changing climate.

The same notion applies to other disasters, such as flooding and infectious disease, according to the researchers. The engineering and landscape modifications built in previous decades to contain floods may in effect actually store more water. The result: an increase in both the intensity and duration of floods that already are expected to grow in magnitude and severity due to climate change-induced acceleration of the hydrologic cycle. Strategies to combat pathogen-borne diseases on the heels of an outbreak brought on by temperature-mediated range shifts in the mosquito population, for instance, have led to resistance and subsequently worse outbreaks.

The desire for immediate response and the need to plan for long-term events sets up a dilemma for decisionmakers, who are expected to address the situation at hand and simultaneously plan for the future.

“The tension is especially intense for elected officials who need to attend to reelection concerns that are quite short-term and the need to think about adaptation in the long-term,” Anderson said. However, she added, she is “optimistic” that disasters and the salience they carry can provide opportunities to think about both near- and far-term solutions.

“For example, at the same time that we take care of recovery needs after a fire,” she said, “we can think about long-term land use planning changes that discourage settlement in fire-prone areas, disaster management that works better and retrofitting houses to make them more resistant to fire.

“I also think that we need to consider how to use the salience of a disaster in one place to enhance preparedness in other places,” Anderson continued. “For example, can we use the story of the 2018 Montecito debris flows to engage people in other places with similar risk — such as all along the San Bernardino mountains — to be better prepared and to respond more quickly to warnings? One thing to note is that government agencies tend to have longer time horizons than elected officials, so they can play an important role.”

Research on this paper also was conducted by Andrew J. Plantinga and Christina L. Tague of the Bren School; Max A. Moritz of Bren and the University of California Cooperative Extension, Agriculture and Natural Resources Division; Ryan R. Bart of the UCSB Earth Research Institute (ERI) and UC Sierra Nevada Research Institute; Andrew J. MacDonald of ERI and the Department of Biology at Stanford University; Matthew Wibbenmeyer of the UCSB Department of Economics; and Maureen Kennedy of the School of Environmental and Forest Sciences at the University of Washington at Tacoma.

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