

Scientists recommend approach to adapt to uncertainty in wildland management

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Scientists from the Rocky Mountain Research Station collaborated to explore how research and management can confront increasing uncertainty due to climate change, invasive species, and land use

conversion.

Wildland management and policy have long depended on the idea that [ecosystems](#) are fundamentally static, and periodic events like droughts are just temporary detours from a larger, stable equilibrium. However, ecosystems are currently changing at unprecedented rates. For example, bark beetle infestations, droughts, and severe wildfires have killed large numbers of trees across the western United States. In many cases, these changes may be irreversible.

In new research published in *Frontiers in Forests and Global Change*, Dr. Kevin McKelvey and colleagues from several Rocky Mountain Research Station science programs suggest ways for managers to respond. As ecosystems change in increasingly unpredictable ways, we will need more flexible and adaptive approaches to manage them. Rather than relying on knowledge of what ecosystems once looked like, we will need to learn and adjust to new conditions quickly. To achieve that goal, the authors recommend a more inclusive and collaborative governance model that would increase public and stakeholder participation, integrate research and management, and incorporate multiple forms of knowledge, including from indigenous communities. Such an approach, they argue, will encourage [collaborative learning](#), increase trust in management, and allow for more efficient responses to change.

"Because all paths forward are fraught with uncertainties, limitations, and the likelihood that plans will fail due to unforeseen events, we need a much broader public not only involved in the [decision process](#), but additionally to understand the limits both to knowledge and to achievable actions," said McKelvey.

The authors also explore priorities for research under this new model. For example, they note that rapidly changing ecosystems will increase our dependency on predictive modeling—and therefore will require

better models. As a result, research should focus on collecting the types of data that support model development and validation.

Finally, the scientists offer a set of concrete recommendations to pivot toward accepting uncertainty—from conducting landscape-level assessments to focusing on retaining species that are resilient to disturbances.

"The implications for management and particularly for planning are profound," said McKelvey. "We need to vastly accelerate the planning process to keep pace with rapidly changing landscapes. We need much more local flexibility to find out what works and what doesn't. And we need to change the process for [data collection](#) and analyses—in many landscapes, 5-year-old data and analyses are already obsolete."

More information: Kevin S. McKelvey et al, Adapting Research, Management, and Governance to Confront Socioecological Uncertainties in Novel Ecosystems, *Frontiers in Forests and Global Change* (2021). [DOI: 10.3389/ffgc.2021.644696](https://doi.org/10.3389/ffgc.2021.644696)

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