



## ENGAGEMENT STRATEGIES

HELPING FACILITATE DEVELOPMENT & IMPLEMENTATION OF ADAPTATION OPTIONS

RESEARCH BRIEF 14 • SUMMER 2017

Throughout the western U.S., fire suppression and land management practices have resulted in high-density forests that are at increased risk of high-severity wildfire, insects, and disease. Climate change projections show trends of increasing temperatures, changing precipitation patterns, and more prevalent drought that will further stress forests, increasing vulnerability to insects and disease, and exacerbating risks of high-severity fire. Interactions among these multiple stressors may result in rapid change in forest ecosystem composition and structure, and the ecosystem services provided. Climate change adaptation in forest management is critical to minimize negative climate change impacts, and it requires tools and information that can help managers assess vulnerabilities and implement options at the project level.

In this paper, the authors describe an approach to facilitate development and implementation of climate change adaptation options in forest management which they applied to a case study area in southwestern Oregon, USA. Their approach relied on participation of local specialists across multiple organizations to establish a science–manager partnership, development of climate change education in multiple formats, hands-on development of adaptation options, and application of tools to incorporate climate change in planned projects.



Photo courtesy of Jessica Halofsky, University of Washington.



Photo courtesy of Carrie Berger, Northwest Fire Science Consortium

## KEY FINDINGS

- Science–management partnerships can effectively incorporate evolving science, regardless of the socio-political environment, and facilitate timely progress in adaptation to climate change.
- Presenting information in multiple formats including webinars, a workshop, and a field trip engaged a larger, more diverse group.
- Increasing the knowledge base about climate change effects, and adaptation tools on the ground will provide greater confidence for implementing management shifts on projects.

*The Northwest Fire Science Consortium is a regional fire science delivery system for disseminating knowledge and tools, and a venue for increasing researcher understanding of the needs of practitioners.*



## RESULTS

### Science-manager partnership

In the Rogue Basin study area, the authors found that strong social networks and collaborative groups formed with community members, scientists, and land managers helped foster communication, engagement, and crucial momentum for forest restoration and climate adaptation.

### Education

The authors developed an engagement strategy for local managers that progressed from a series of five webinars—that provided a base of information from climate projections for the Rogue Basin—to a one-day hands-on workshop and finally, a field trip to facilitate applied adaptation planning for land managers. This engagement strategy from base information to active engagement in planning options allowed the authors to engage a more diverse group.

### Hands-on development of adaptation options

At the one-day hands-on workshop, the authors reviewed the information from the webinars and then spent the rest of the day in small working groups developing adaptation options. An example of an adaptation option included prioritized thinning treatments in locations where climate change effects are expected to be most pronounced, such as in high-value habitat and in high-risk locations such as the wildland-urban interface. Another option suggested by managers was prescribed burning to mimic effects of wildfire in reducing stand density and fuels.

### Application of tools to incorporate climate change in planned projects

Nearly all federal natural resources management agencies have a general response strategy for adaptation to climate change, but lack of previous adaptive management examples, little funding, and translation of executive orders and overarching strategies to on-the-ground projects has proven difficult. The authors used a half-day field trip to the Table Rocks Oak Restoration project area to illustrate how on-the-ground projects can incorporate climate change. Local scientists described how climate change was considered in the project which then provided a framework for planning that led to collaborators building on that framework to successfully secure funding for management actions.

## MANAGEMENT IMPLICATIONS

Adaptive management in a changing climate is a nested and iterative process of decision making and is a process that is aimed at improving long-term management outcomes. The author's approach involving education, tools, and a facilitated process to develop adaptation options for specific projects can provide confidence for making adaptive shifts in management under a changing climate, particularly when supported by a strong collaborative dynamic. Involving scientists and managers can increase managers' knowledge about climate science and potential impacts, and can also help scientists better understand local effects, management context and constraints, and application of science to a particular project.



Photo courtesy of Carrie Berger, Northwest Fire Science Consortium.

## MORE INFORMATION

### This brief is based on the following article:

Halofsky, J.E., D.L. Peterson, K.L. Metlen, M.G. Myer, V.A. Sample. 2016. Developing and Implementing Climate Change Adaptation Options in Forest Ecosystems: A Case Study in Southwestern Oregon, USA. *Forests* 7: 268. doi:10.3390/f7110268.

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*This research brief was funded by the Joint Fire Science Program.*