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Thank you Chairman Rouda, Representative Hill, and other members of the committee. I am honored to join you today to talk about recent destructive wildfire events in California, the causes of fire-related losses, and ways to increase future resilience of communities living in these environments.

I have studied various aspects of wildfires, their causes, and their effects for roughly 25 years, the last 15 of which I have been a statewide Cooperative Extension Wildfire Specialist for the University of California. In this capacity I have pursued many fire-related research questions and how to translate scientific findings for Californians, ranging from land managers to policy makers to typical homeowners.

If there is one point I hope to make up front, it is that we have an oversimplified perception of "the wildfire problem" in our society. There are several different issues we face that are related to wildfire. We will therefore make little progress toward solutions, until we have a clearer understanding of what to fix.

As a symptom of this misunderstanding, consider the narrative we often hear from the public and the media about wildfire. There are many examples of research showing increasing trends in fire activity and how this is projected to continue into the future (Fig. 1). Linked to this is the expectation for more and worse forest fires (Fig. 2). Such fires are typically assumed to cause more home losses (Fig. 3), and ultimately more "urban conflagration" disasters such as those we have seen in the last few years in California (Fig. 4). But is this really a causal chain of events?

We have learned a lot about why homes burn, and it is usually due to embers – burning bits of wind-blown material – or by ignition from a neighboring home. In case after case there is unburned vegetation surrounding the homes (Fig. 5), which may seem counter-intuitive, but it reveals an important lesson. Home ignition and loss is generally not a "fuel" problem related to vegetation. Furthermore, most home losses do not happen in what we traditionally think of as "forest." These losses are instead a function of where and how we have built our communities (Fig. 6).

Notably, it has become widely appreciated in the scientific community (e.g., Calkin et al. 2014, Schoennagel et al. 2017) that we have two distinct but related problems:

1) Fires on "wildlands" such as forests and other fire-prone ecosystems (i.e., climate change, land management, ignitions); and
2) "Wildland-urban interface" (WUI) fires in our built environments (i.e., loss of lives and homes due to the location and design of communities).

Until we clearly see this as two distinct problems, we will fail to address underlying causes and make real progress on their solutions. To be more specific, the calls for better fuel management on wildlands will do little to slow the trends in growing home losses.

Addressing characteristics of the WUI – how and where we build our homes – needs to be a clear focus. The WUI is much more a public health and safety issue than an ecosystem management issue. Until we recognize and treat is as such, we will simply continue current development patterns and make the problem worse.

In the limited time we have here today, I would like to offer a few options that will make a difference to all of us affected by losses in the WUI.

Locally: Many USFS lands that are near communities are drastically under-funded, and these are often areas where public education and risk mitigation could do the most good. We need to see increased funding for local USFS lands, allocated by WUI exposure and fire history.

Statewide: For existing communities already on fire-prone landscapes, we need more a comprehensive approach to retrofitting the homes, the landscapes, and the mindsets of those who live there. The current reliance on community wildfire protection plans (CWPPs) is not enough. For new communities we need to incorporate the latest scientific understanding into urban planning, specifically regarding *the location and layout of development*, into codified guidance.

Federal level: To stem the tide of home losses and fire-related fatalities, we must examine and address the unintended consequences of how taxpayer dollars influence ongoing development. Through housing and urban development, transportation, and other federal flows of funding to the states we are often unintentionally promoting new development in hazard-prone environments. There simply must be stronger guidance on fed-to-state funding to minimize our exposure to losses. We have scientifically credible maps now for several natural hazards like floods and fires. The allocation and use of taxpayer funds, if they in any way influence future development, must be prioritized in lowest hazard areas and restricted in highest hazard areas. Where these funds apply to existing development, their allowed use should be expanded beyond fuel reduction, to include home and community building retrofits that reduce ignition vulnerabilities.

In closing, please focus on the public health and human safety aspects of WUI fires, which are not the same as wildfires across the broader landscape. The problems are different and so are the solutions. We urgently need to address the issue of where and how we build our communities in this country.

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Citations

Calkin, D.E., Cohen, J.D., Finney, M.A. and Thompson, M.P., 2014. How risk management can prevent future wildfire disasters in the wildland-urban interface. *Proceedings of the National Academy of Sciences*, 111(2), pp.746-751.

Moritz, M.A., Parisien, M.A., Batllori, E., Krawchuk, M.A., Van Dorn, J., Ganz, D.J. and Hayhoe, K., 2012. Climate change and disruptions to global fire activity. *Ecosphere*, 3(6), pp.1-22.

Schoennagel, T., Balch, J.K., Brenkert-Smith, H., Dennison, P.E., Harvey, B.J., Krawchuk, M.A., Mietkiewicz, N., Morgan, P., Moritz, M.A., Rasker, R. and Turner, M.G., 2017. Adapt to more wildfire in western North American forests as climate changes. *Proceedings of the National Academy of Sciences*, 114(18), pp.4582-4590.

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Additional supporting material for policy changes

https://moritzfirelab.org/extension-publications/

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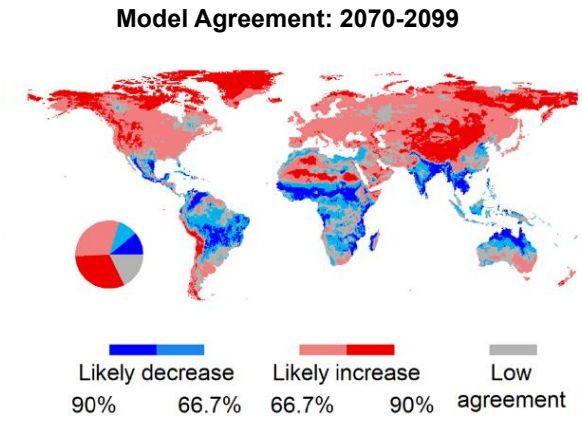
Increasing Fire Activity



(Moritz et al. 2012)

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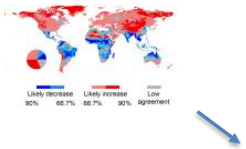
Figure 1. Future fire probabilities based on an ensemble of global climate models (Moritz et al. 2012).



More Severe Forest Fires

(Wikimedia Commons)

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Figure 2. Example of wildfire in coniferous forest (Bitterroot National Forest, 2000). Many assume that increasing fire-prone conditions will lead to more and worse forest fires, which is generally supported by the scientific literature.
(see https://www.thoughtco.com/most-famous-wildfire-photograph-ever-taken-1342839 for additional information on image)

Figure 3. Example of burning home (Angora Fire, 2007). With more forest fires, people generally assume this will cause more home losses.

Figure 4. Urban home loss example (Tubbs Fire, 2017). The narrative typically links increasing fire activity in forests and other wildlands to “urban conflagration” disasters like this, which is incorrect.

What is common here, despite vast differences?

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Figure 5. Many home losses occur, but with unburned vegetation nearby. Structures typically ignite by burning embers or neighboring homes and not the adjacent vegetation.

Figure 6. A broken narrative around home losses in the wildland-urban interface (WUI). Home losses are not causally linked to increasing fire activity in forests, but instead due to where and how we build our communities. Until we recognize this problem as a public health and safety issue – directly related to urban planning and the WUI – we will mistakenly rely on fuel management in wildlands as a solution.