Experts call for different approach to wildfire management in Mediterranean-type regions

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Photo: NOAA Photo Library (www.flickr.com)

Wild1re risk is high in the summer in Mediterranean-type climate regions. These regions are distributed over 1ve continents: Africa, Australia, Europe, North America, and South America. They share a strongly seasonal climate, with cool, wet winters that promote vegetation (fuel) growth, and hot, dry summers that enhance vegetation 2ammability.

In recent decades, millions of new inhabitants and homes have moved into the wildland-urban interface in these regions. Human alterations of landscapes, and warming and drying climates plus ignitions (most often anthropogenic) during periods of severe 1re weather have led to an increased prevalence of extreme wild1re events that often result in very large burned areas and signi1cant impacts on human lives and assets.

The answer to this has been to increase expenditure on reactive 1re suppression. This strong focus on 1re suppression is destined to fail, a group of experts from all continents argue in a

recent perspective on wild1re management in the journal Environmental Research Letters. Focus must shift to mitigation and adaptation instead.

Fire suppression ineffective at extreme wildfires

Most experts agree that global warming will increase 1re danger and burned areas in Mediterranean-type climate regions. The impact of global warming will be further exacerbated by ongoing changes in land use and management that increase fuel loads and continuity. Land use changes include expansion of human settlements into 1re-prone areas, introduction of and invasion by 1re-promoting exotic species, establishment of large, poorly managed tree plantations of highly 2ammable species, and agricultural land abandonment as a consequence of rural depopulation, resulting in replacement by unmanaged vegetation. Together, these trends lead to an increase in the amount and connectivity of fuel at the landscape-level, as well as the expansion of wildland-urban interface and inter-mix areas.

It is mostly extreme weather (1re weather) that drives extreme wild1re events. Land cover type has little impact on the spreading of the 1re, except where large-scale and sustained strategic fuel reduction activities are implemented. Under these extreme conditions, 1re suppression is largely ine0ective even in cases of massive resource deployment. This is due to a combination of factors including strong winds that preclude ground engagement and aerial support, simultaneity of ignitions, and 1re intensity above extinction capacity.

Shortsighted policies lead to firefighting trap

By largely ignoring climate warming and landscape-scale buildup of fuels, policy makers have fallen into the so-called ½1re1ghting trapI. Most of the investment in 1re management has been allocated to 1re suppression. This has contributed to ongoing fuel accumulation and landscape-level fuel continuity, and thus, paradoxically, has exacerbated the problem: it is getting more di3 cult to suppress 1res under extreme 1re weather, leading to more severe and usually larger 1res.

The wild1re suppression approach is shortsighted, the scientists argue in their perspective paper. It seeks to minimize burned area in the short-term, treats 1re as delivering only negative impacts, and tends to react to public opinion with ever-greater investment in 1re1ghting capacity. Also, post-1re management, when implemented, is not always oriented to 1re hazard mitigation in the medium/long-term. As a result, current land use and policy settings will likely result, in the long run, in larger burned areas and/or a greater share of total burned area being accounted for by the largest, and most intense 1res, exacerbating both ecological and socio-economic impacts.

Aim at reducing damage, rather than area burned

The scientists stress that no amount of investment in suppression will prevent extreme wild1re events, in particular if the climate of Mediterranean-type climate regions is to become warmer and wetter, driving productivity and thus 2ammable biomass. Focusing on reducing area of land burned in any given year will merely postpone them. In fact, extreme

1re weather and landscape-scale fuel hazard may con2uence and generate 1res of extraordinary intensity, seriously threatening lives, property and ecosystems.

According to these experts, the only alternative is to aim for reduced 1re severity across large areas and in key locations, to minimize negative impacts to society, ecosystems and their services. Focus must shift from targets emphasizing reductions in area burned to targets more closely related to reducing 1re negative impacts, including human lives lost, direct economic losses, soil erosion, water and air quality, carbon emissions, and biodiversity impacts. They propose that governments develop and implement a policy based on two key elements: promoting less vulnerable and more 1re-resilient landscapes, and minimizing risk for humans and infrastructure.

Targeting the reduction of the amount and connectivity (landscape design) of fuels would reduce 1re growth rate, increase the potential for 1re suppression, and mitigate 1re damage. A0orestation, reforestation and forest management should incorporate these aims, for instance by including species selection considering 2ammability. Agricultural policies should be better aligned with forest and 1re policy, particularly in the Mediterranean Basin where maintaining farmland areas surrounding villages can help avoid vegetation encroachment around assets. Under controlled conditions, prescribed burning or fuel reduction burning is a very cost-e0ective fuel treatment to reduce hazard and suppress 1re.

Post-1re management provides a window of opportunity to implement large-scale and socially acceptable changes in forest and landscape planning that can create more 1re-resilient and less 2ammable landscapes.

Interaction with local population

Also, programs may be set up to promote the removal of fuels by local communities. In areas undergoing agricultural land abandonment, encroachment of highly 2ammable vegetation and tree plantations around rural settlements ought to be contained.

For the local population, community preparedness is a key component of a policy targeting reduced damage. This includes the de1nition of ½stay-or-goI policies, safe escape route, and the engagement of local communities in the design and planning of mitigation actions.

Reducing anthropogenic 1re ignitions remains an important component of all 1re management strategies although, if not matched with the management of fuels, it will contribute to the 1re1ghting trap.

A policy shift from suppression to mitigation and adaptation

The scientists stress that 1re suppression must continue to play a key role in the protection of human lives and assets in Mediterranean-type climate regions. They also conclude, however, that extreme wild1re events will occur more often even in the face of escalating 1re suppression expenditures. The focus on 1re suppression must therefore shift to one on mitigation, prevention, and preparation. This may be di3 cult, they realize: 1re suppression,

when it works, has and immediate e◊ect and is visible to the media, while fuel management is a much less visible investment on the long-term, and out of synchrony with electoral cycles.

Still, they conclude, replying to each catastrophic ◊re season with ever increasing ◊re suppression expenditure, while disregarding mitigation and adaptation, will continue to be a major political mistake.

Source: Moreira et al., 2020. Environmental Research Letters 15.