It has been a brutal fire season here in California. It's been brutal in part because of a historically bad drought. But unfortunately, the end of the drought (when it comes) will not be the end of our fire problems. Those fire problems are the result of long-term, human-caused trends that will only continue: climate change, and the history of fire suppression, as is well chronicled in this New York Times story.

First, climate change will produce hotter, drier fire seasons, which means that forests will burn hotter and faster. That in turn means they will spread faster (causing disasters like the Valley Fire), and in turn they will cause fundamental changes to forest ecosystems across the state (and the West). If fires burn hotter, they will burn in different ways – they will reach the crowns of trees, killing large trees that might have otherwise survived the fire; they will burn the organic material in soils, making it much longer until vegetation can recover; they will cover larger areas of the landscape, changing how forests return (if they do it all). In the long run, climate change will result in significant shifts to the locations and composition of our forest ecosystems. For instance, forests in coastal California may be replaced by chaparral.

Second, these impacts are exacerbated by over a century of fire suppression – a general policy of putting out fires as quickly as we detect them, across the landscape. There was a lot of fire before European settlement in the Western United States – and that regular fire controlled the accumulation of dead and living vegetation in many ecosystems, restricting the amount of fuel that could build up, and keeping fires relatively low temperature. But a century of fire suppression (together with some problematic forest restocking efforts by public and private landowners) has produced a different landscape today – a landscape filled with lots of dead vegetation, and lots of dense living vegetation that, when it burns, will burn fast and hot.

What to do about these long-term trends so that we can reduce the risks of disasters like the Valley Fire, and minimize the long-term losses of important resources from climate change? There are lots of discussions about how to improve our fire policy, and I plan on writing more on the topic here and elsewhere. But there are some basic principles that I think are important.

First, we have to accept the existence of fire as part of our landscape and our lives in the Western United States. That does not mean accepting that people will die because of fire. But it does mean that, in the long run, there will be fire – whether we want it or not. And the more we resist fire, the worse the impacts of fire will be

on human society and on natural systems. In particular, we need to fundamentally reconsider our current policy that the default rule is that we suppress all fires. (Federal land management agencies are increasingly changing that default rule, and those changes need to be supported.) Policy proposals that are based on stopping or ending fire are fundamentally flawed, and will fail. Unfortunately, that is all too often what political leaders advocate (pdf).

Second, we have to reconsider public policies that have subsidized and facilitated development in areas that are highly vulnerable to fire – what is often called the wildland-urban interface. Suburban or exurban developments that are scattered in forest areas create political pressure for firefighters to suppress more fires in order to protect human lives and property. The result is expanding the zone within which we have to suppress fires – a strategy that is excessively costly (over half of the U.S. Forest Service budget is now spent on fire suppression! (pdf)) and that is ultimately futile.

Third, we need to think about fire as a central goal to land and natural resources management on public and private lands. We need to think how we can facilitate management of our lands such that we get good fire outcomes, not bad fire outcomes. That will require examining how our public land management agencies are structured and function, and how our legal system operates, to facilitate the management tools needed, such as actively using fire to reduce fuel loads in our forests.

Fourth, we will be spending a lot of money – a whole lot of money – managing our landscapes for fire. There are millions of acres that will require management through tools such as prescribed burns (intentionally set fires to reduce fuel loads) and the removal of dead and living vegetation from forests (e.g., mechanical thinning and even appropriate use of logging). We can either invest in these activities now, or pay the cost later in long-term fire impacts.

(A good summary of these basic principles is in this article in *Science*, unfortunately behind a paywall.)

Finally, there are definitely approaches that are counterproductive. In particular, what we do not need is legislation like what Congress is currently considering that uses concern over fire risks to push an agenda of dramatically increasing commercial logging and weakening environmental laws on our National Forests. These bills would impose mandatory minimum amounts of commercial logging on

those forests (pdf), based on spurious claims that it is the decrease in commercial logging that has led to increased fire risks (pdf). Or they weaken environmental laws to facilitate logging for the purpose of creating early successional habitat for species like wild turkeys (see this testimony by the National Wild Turkey Federation supporting a recent bill in Congress that would exclude from various environmental laws management projects to create more wildlife habitat). These are not steps that will help us manage fire in our forests. Indeed, they are positively counterproductive – by connecting fire to commercial logging or other goals such as increasing wildlife game species, they are instead more likely to polarize debates and reduce trust about forest management. And without that trust, we cannot address the challenges we face. (Full disclosure: I testified on one of these bills before Congress, and was highly critical of the legislation. You can read my written testimony here (pdf) and watch the hearing here.)