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Our changing fire regimes

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North Central
Climate Adaptation
Science Center



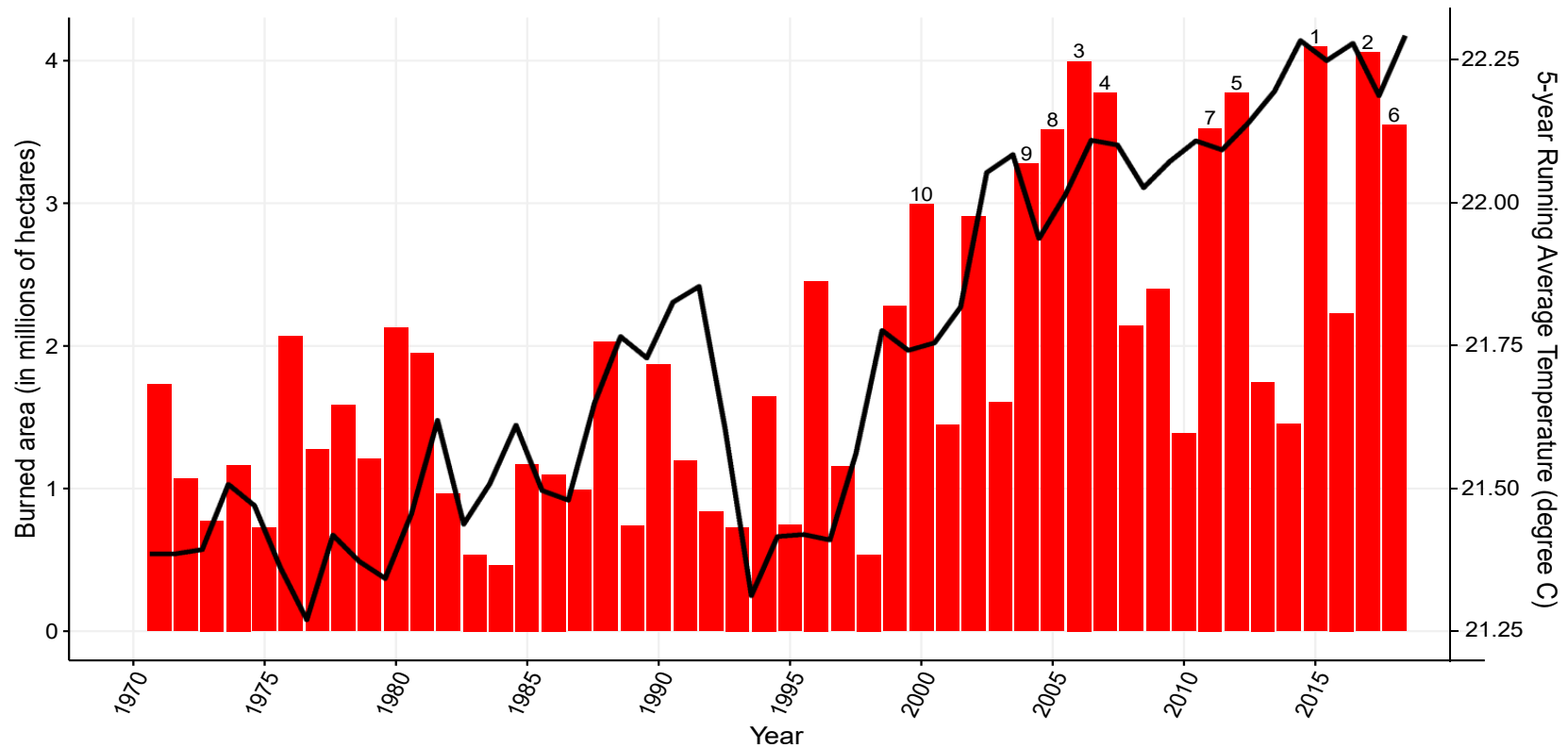
Three ingredients for fire:
climate, fuel, & ignition

We are changing all three.

Ingredient #1 Climate

The science is *very clear*.

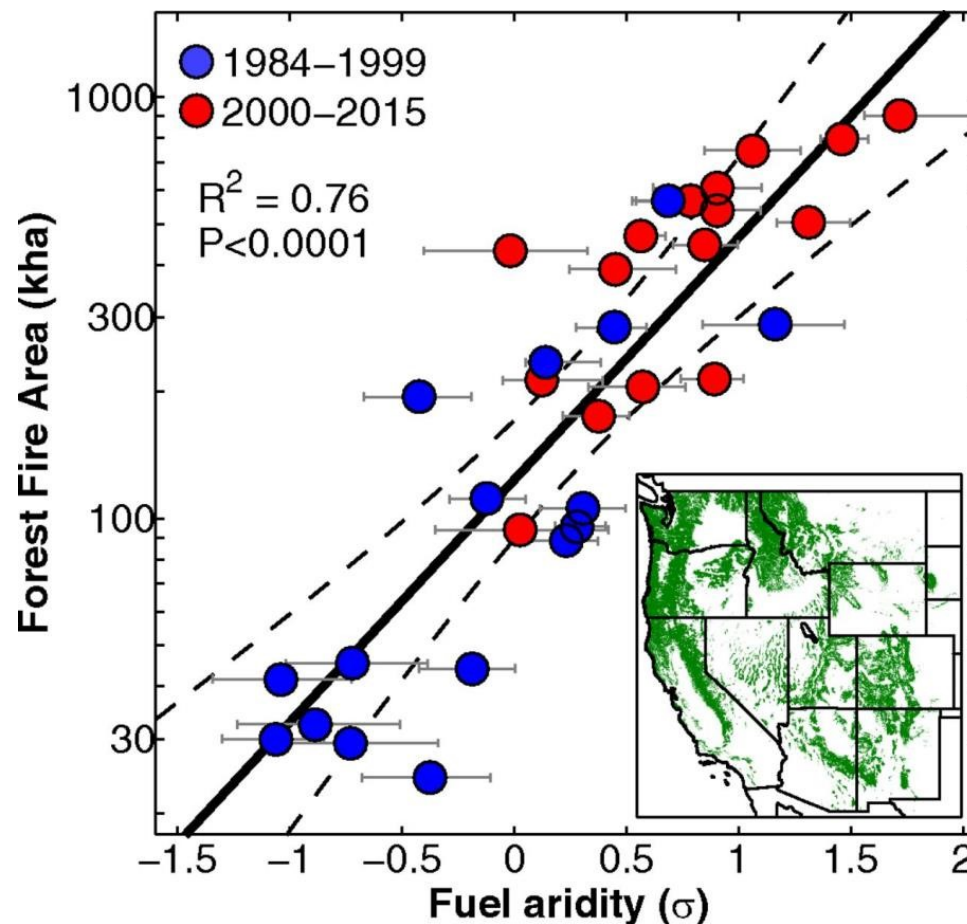
Human-caused warming is linked to more burning in the western U.S.



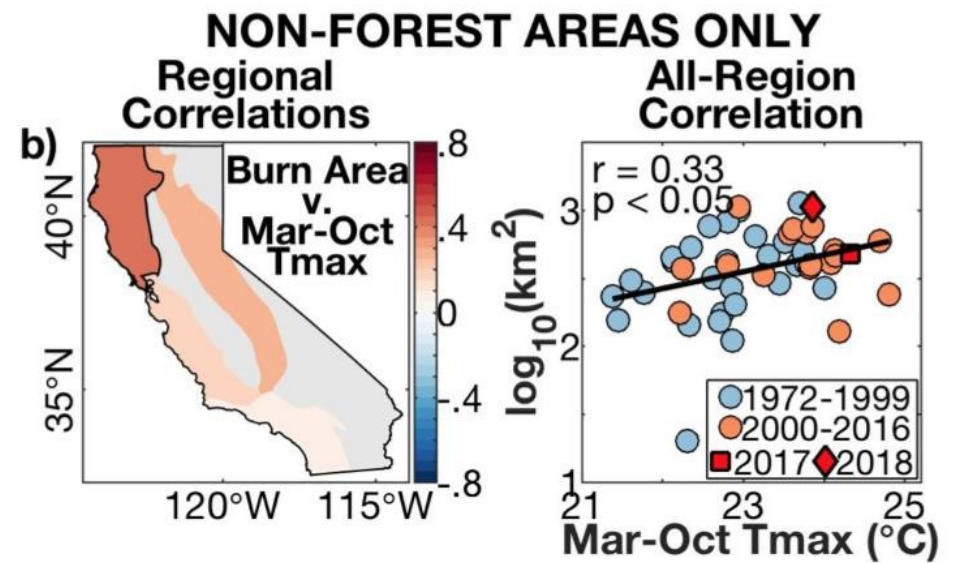
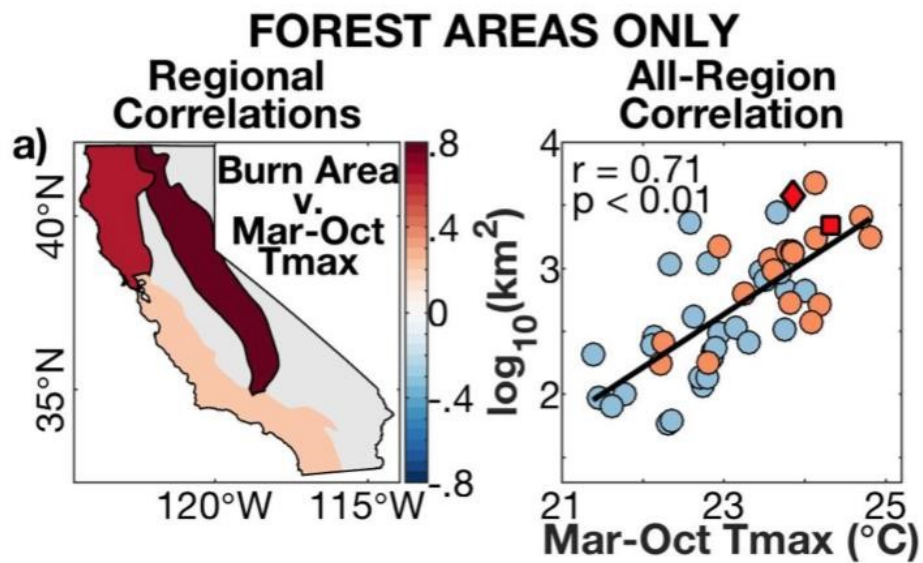
Data from NIFC and NOAA (Accessed April 24, 2019)

Westerling et al. 2006; Stavros et al. 2014; Dennison et al. 2014;
 Westerling 2016; Abatzoglou & Williams 2016; McKenzie and Littell 2017;
 Balch et al. 2018; Williams et al. 2019

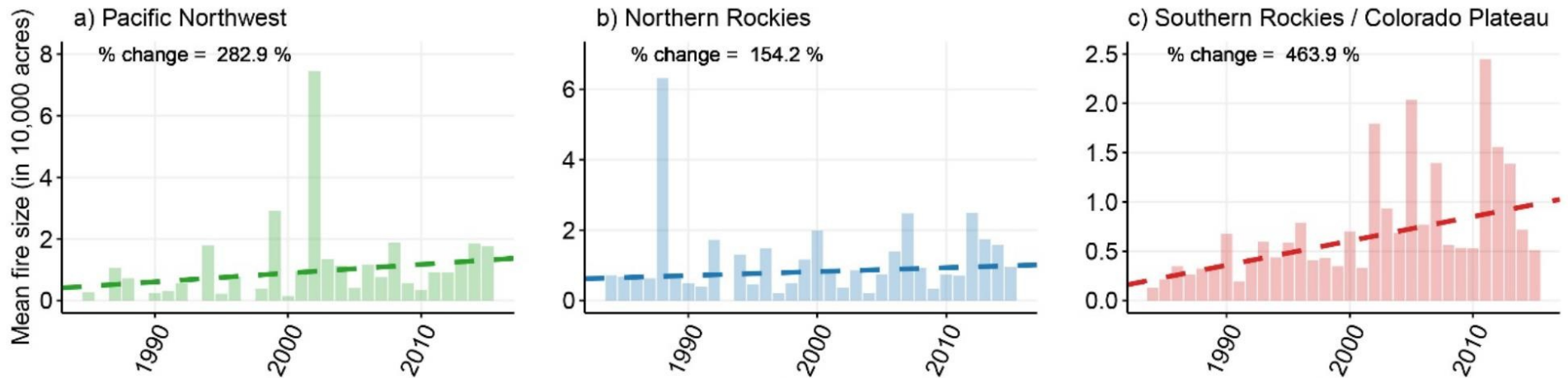
Warming has dried fuels & doubled the amount of western forests that have burned since 1984.



California forests are particularly sensitive to summer warming



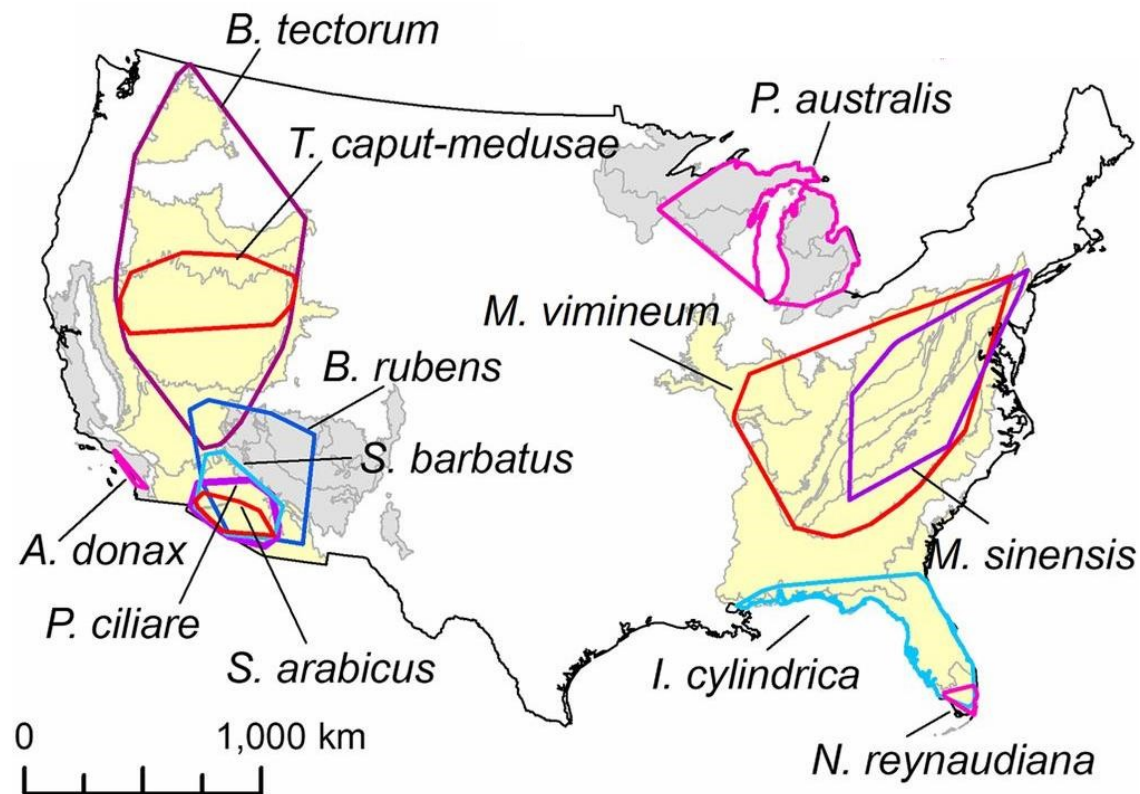
Size and severity are increasing in some ecosystems, but not all.



Ingredient #2: Fuels

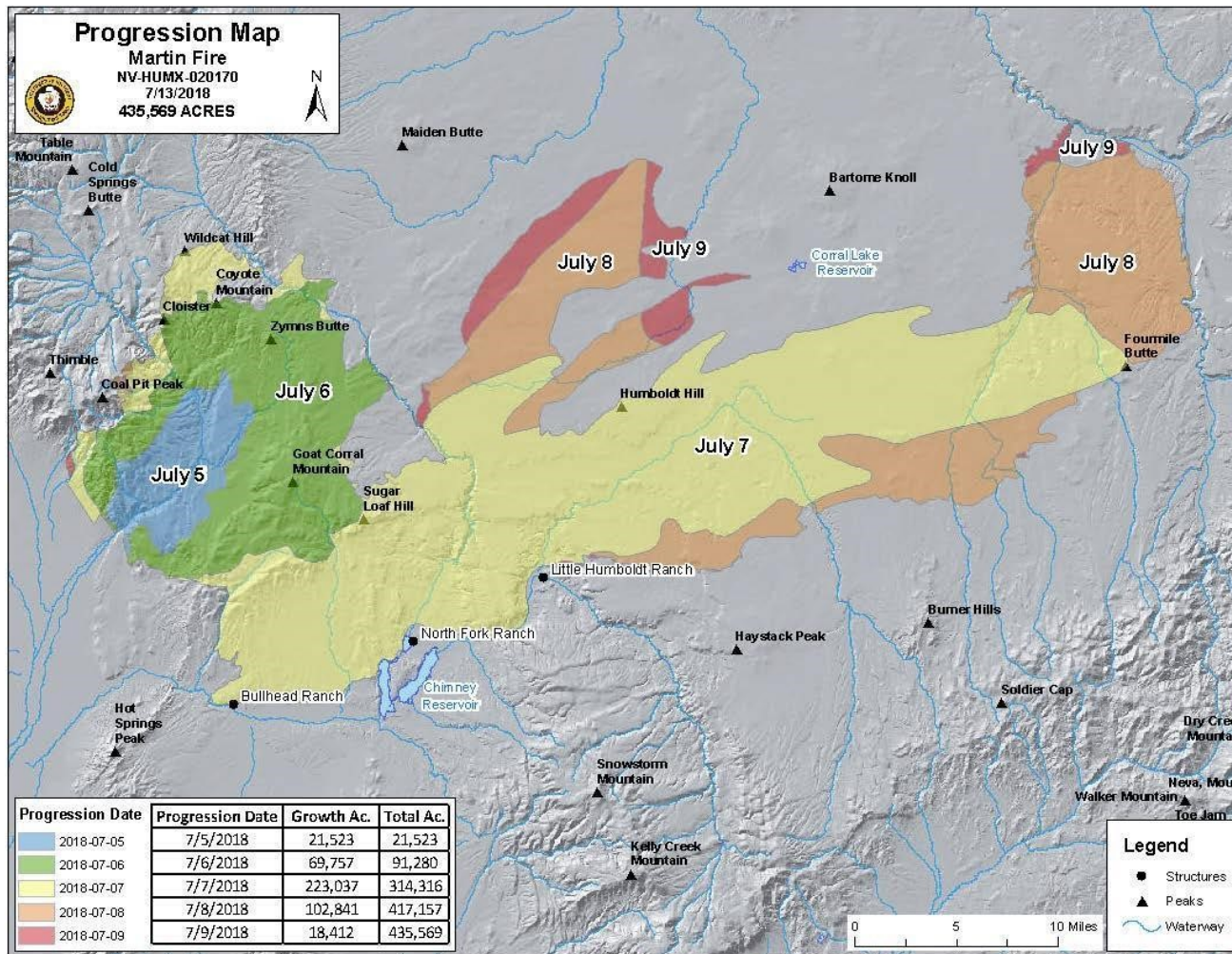
We have changed the nation's fuels through our land use and the introduction of invasive species.

Invasive grasses double or even triple fire activity





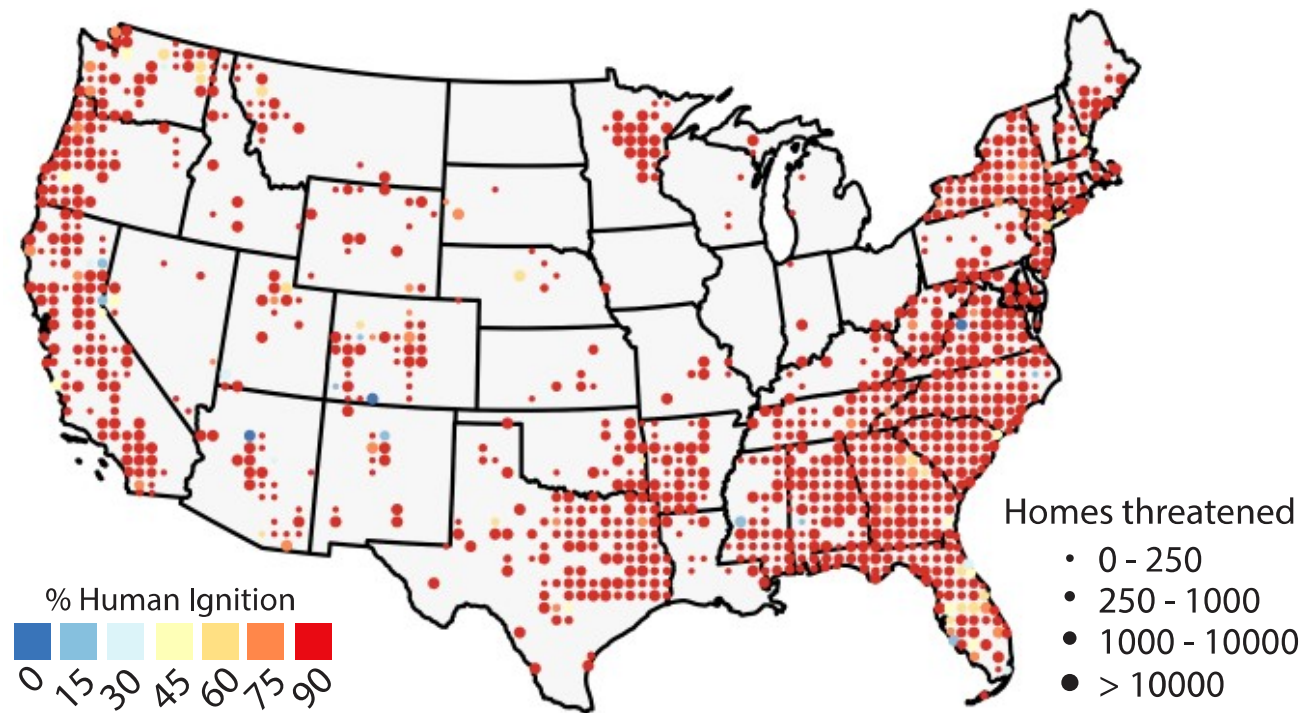
One of the largest fires you've never heard of



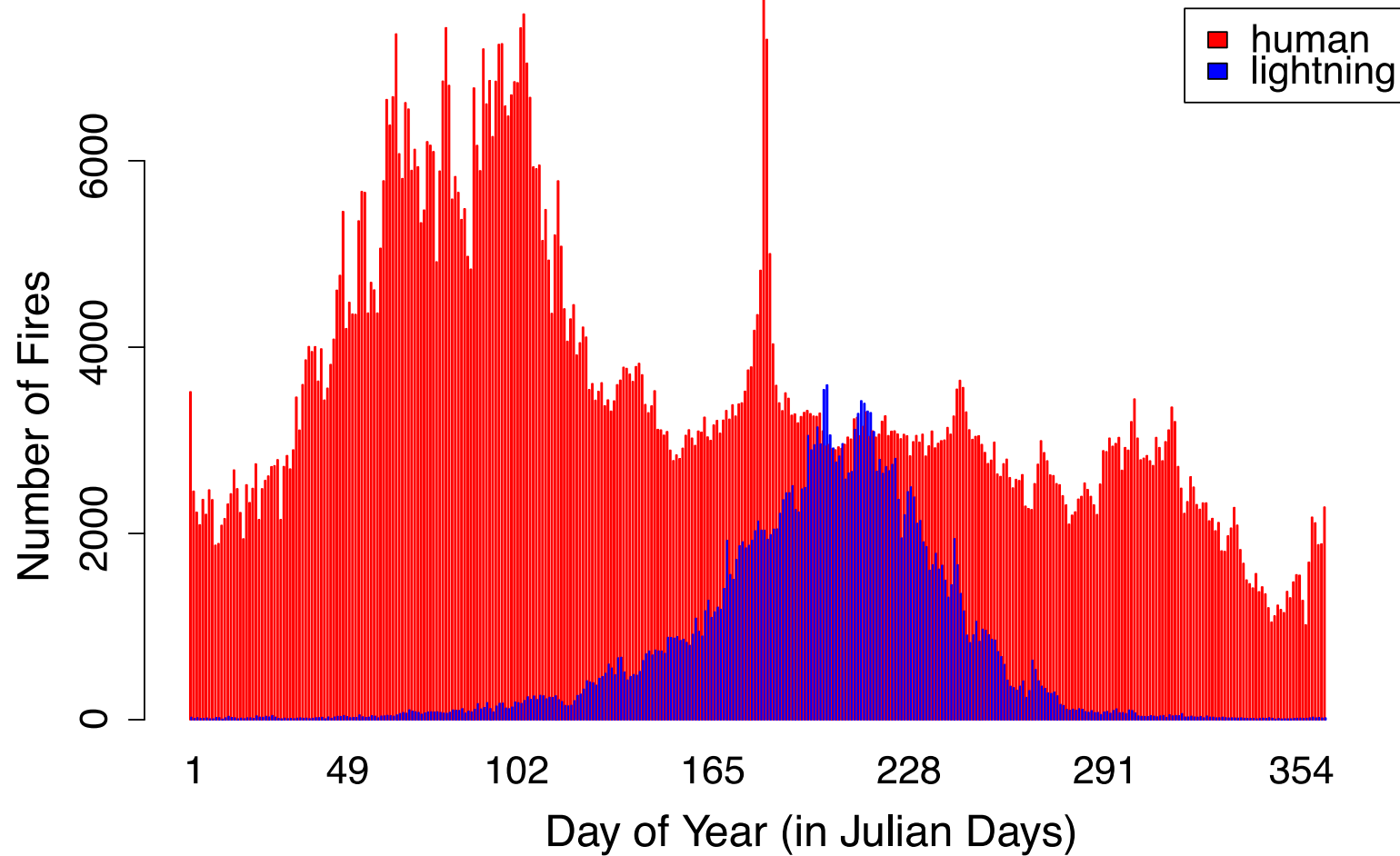
Ingredient #3: Ignitions

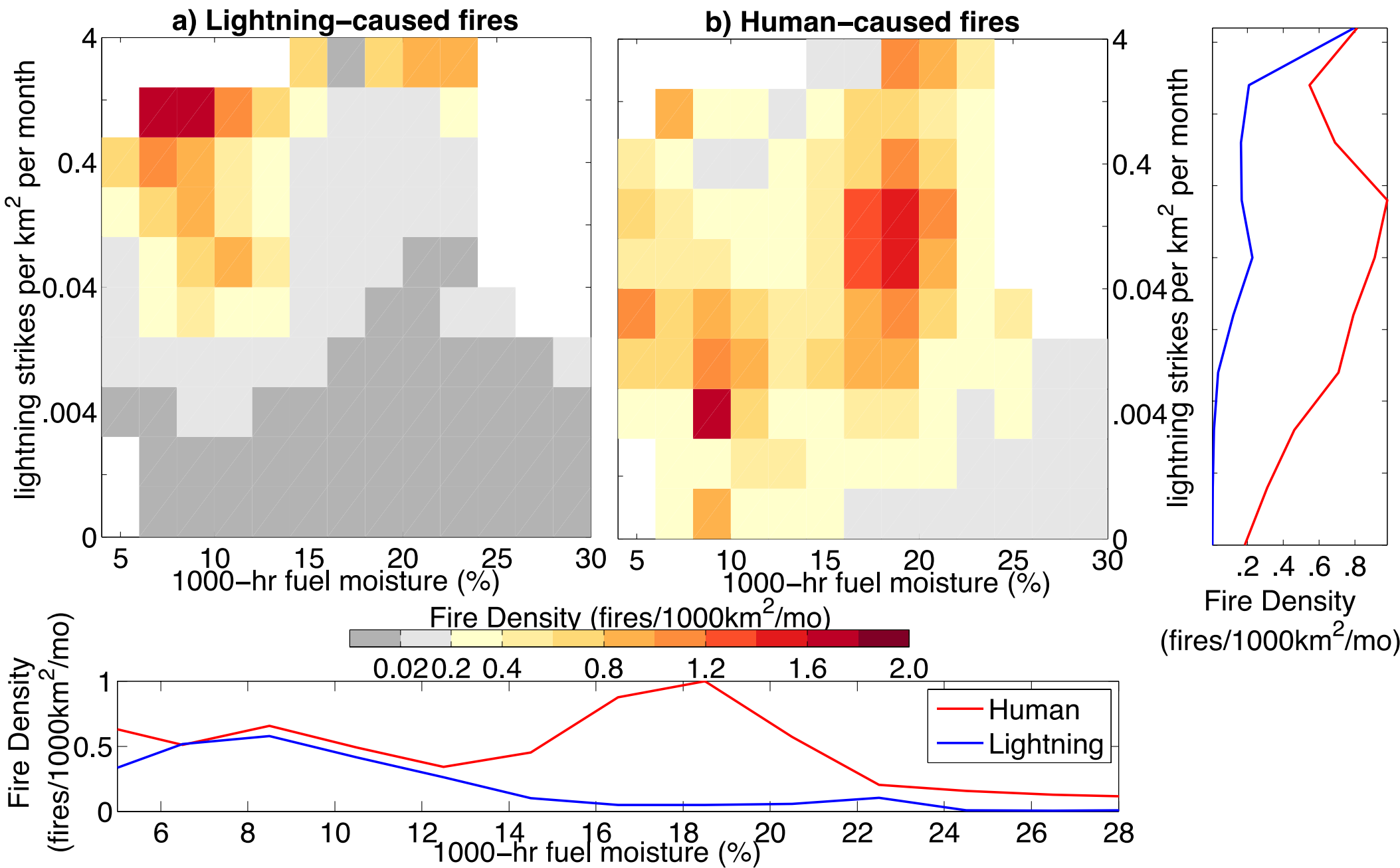
We start over 84% of the
nation's wildfires.

We start 97% of the wildfires
that threaten our homes (1992-2015)



Human-related ignitions tripled the fire season length





Smoke is changing too.

Wildfire smoke will likely be more
intense and widespread.

What's burning? & how hot?

Fires are spreading in forests
that don't typically burn.

Invasive grasses add fuel to the fire.
There are seasonal shifts in burning.

Whose lungs are downwind?

60 million homes were within or up to 1 km away from a wildfire (1992-2015).

13 million people living with extreme fire risk are socially vulnerable Americans.

Wildfires are not so 'wild'



1880 Census of U.S. Fire

Thank you for listening! Thank you to the many, many great scientists for their contributions!



Image: BLM, 2020

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