The role of people in modern U.S. fire regimes

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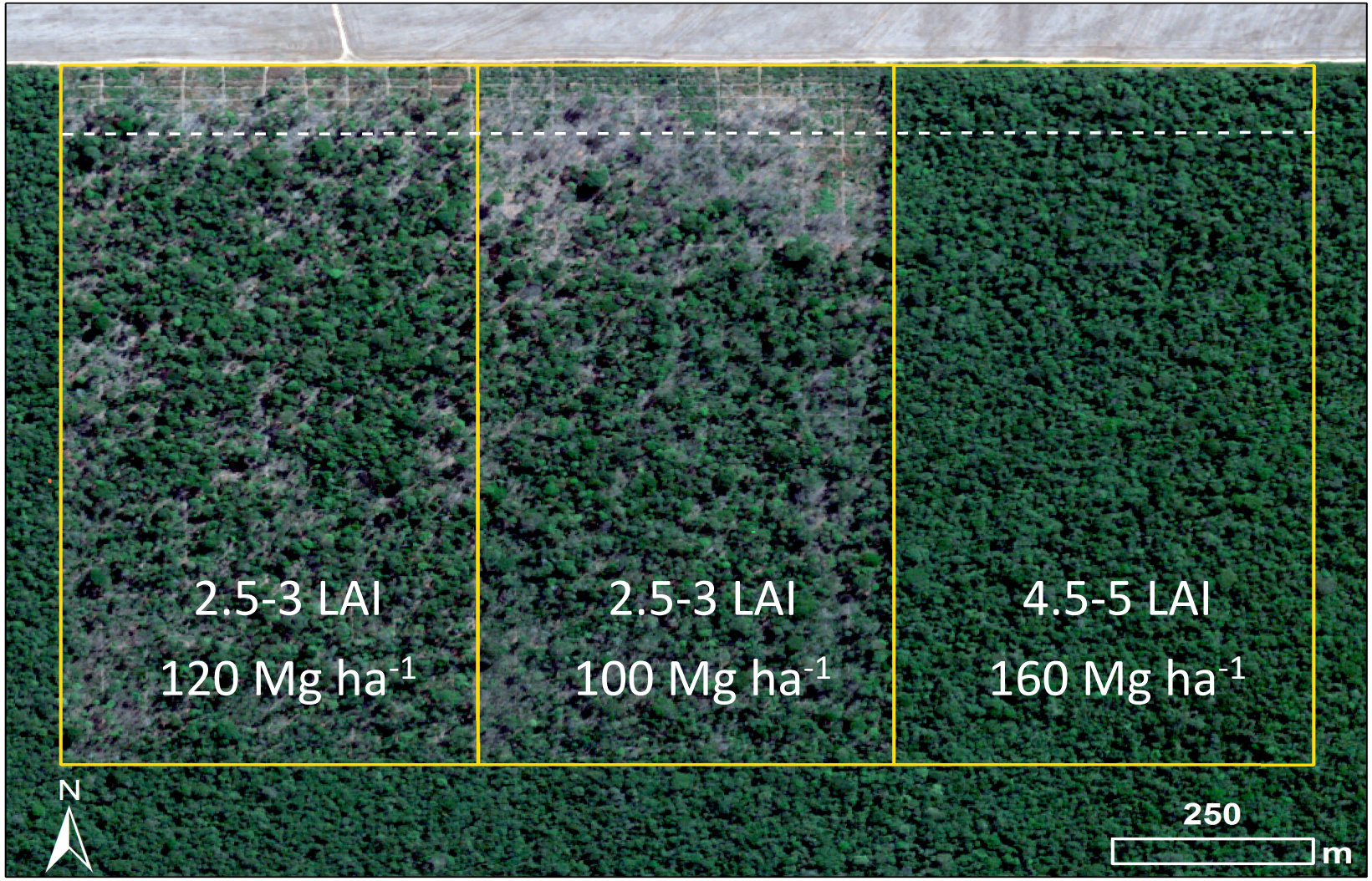
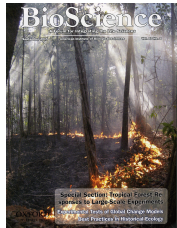
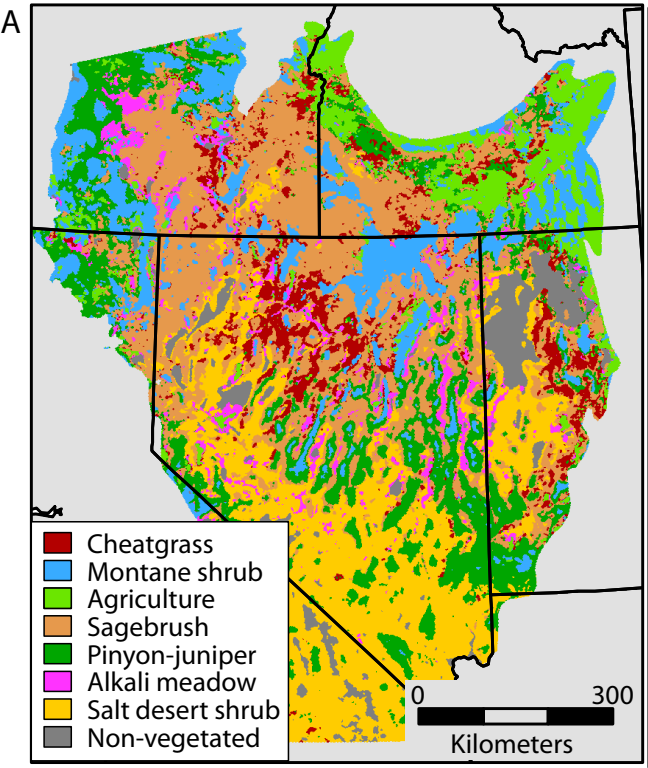
EARTH LAB

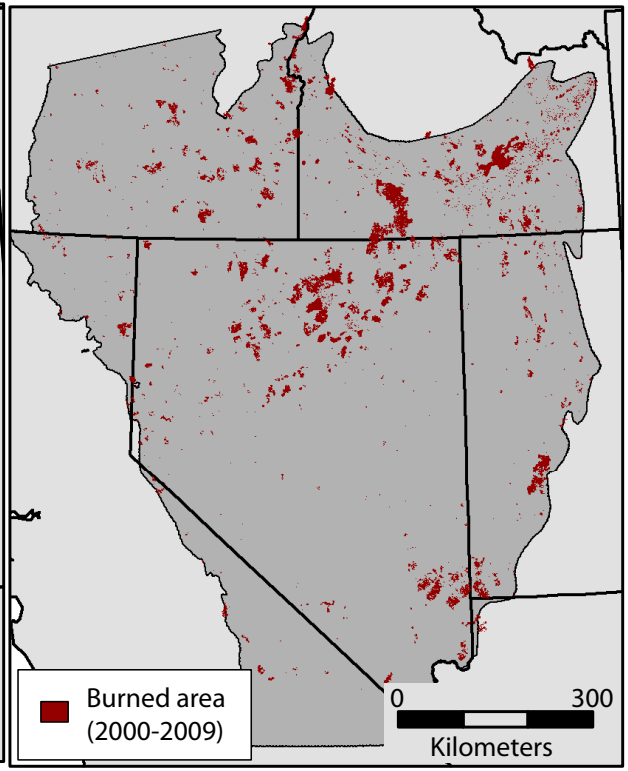


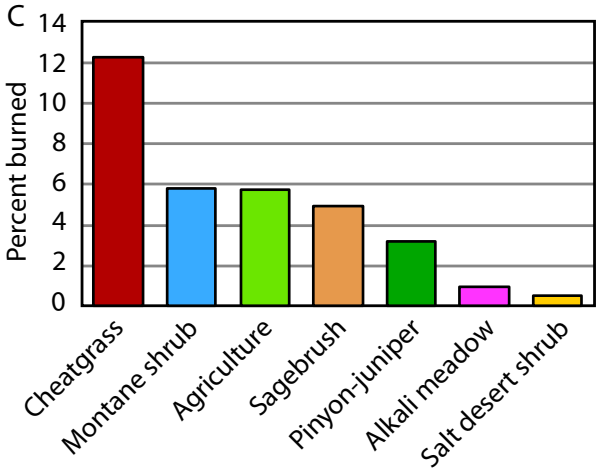
Balch et al. 2015 Bioscience



Grass-fire cycle in the U.S. Great Basin







Balch et al. 2013 *Global Change Biology*

PNAS

Human-started wildfires expand the fire niche across the United States

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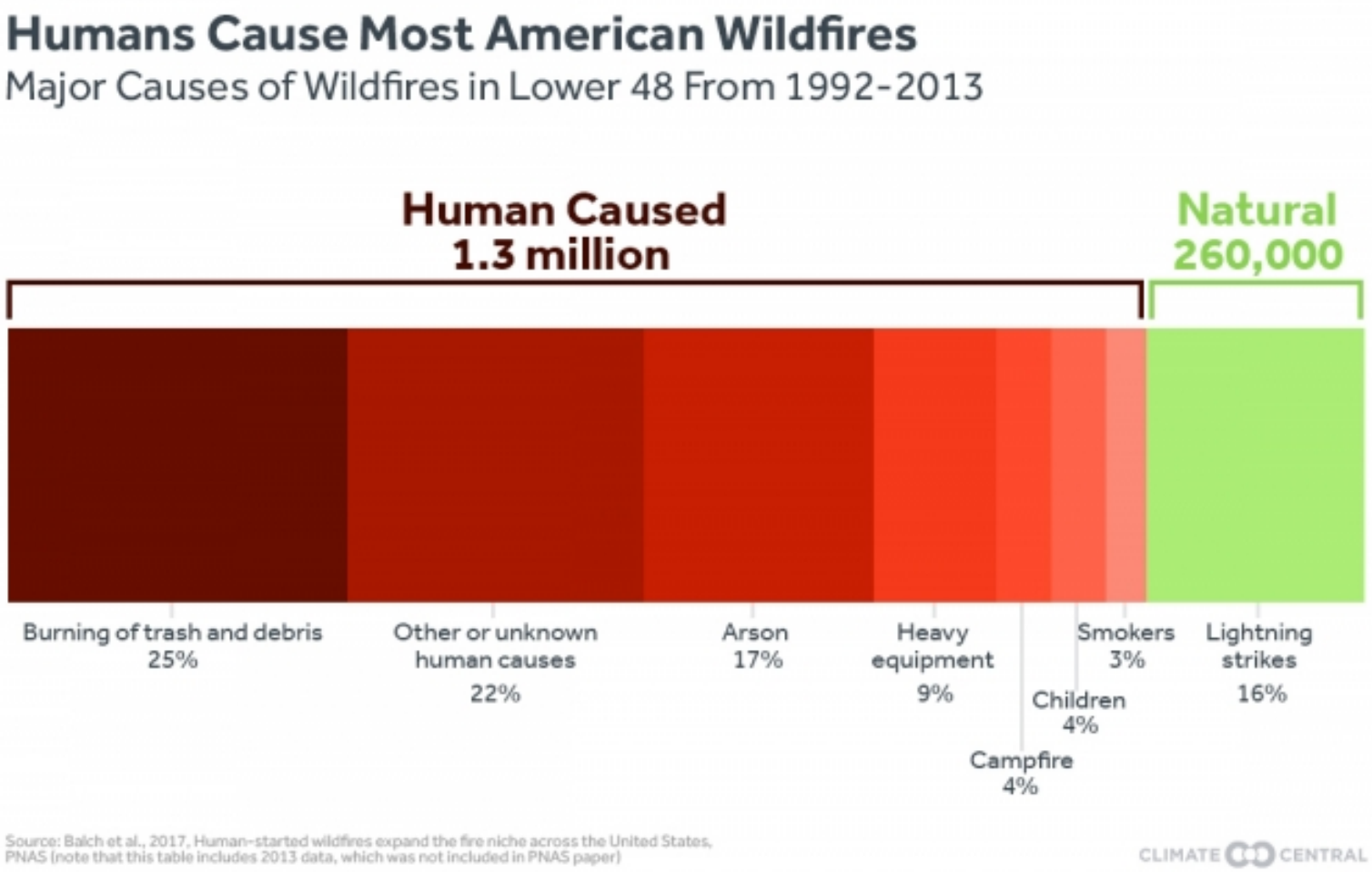
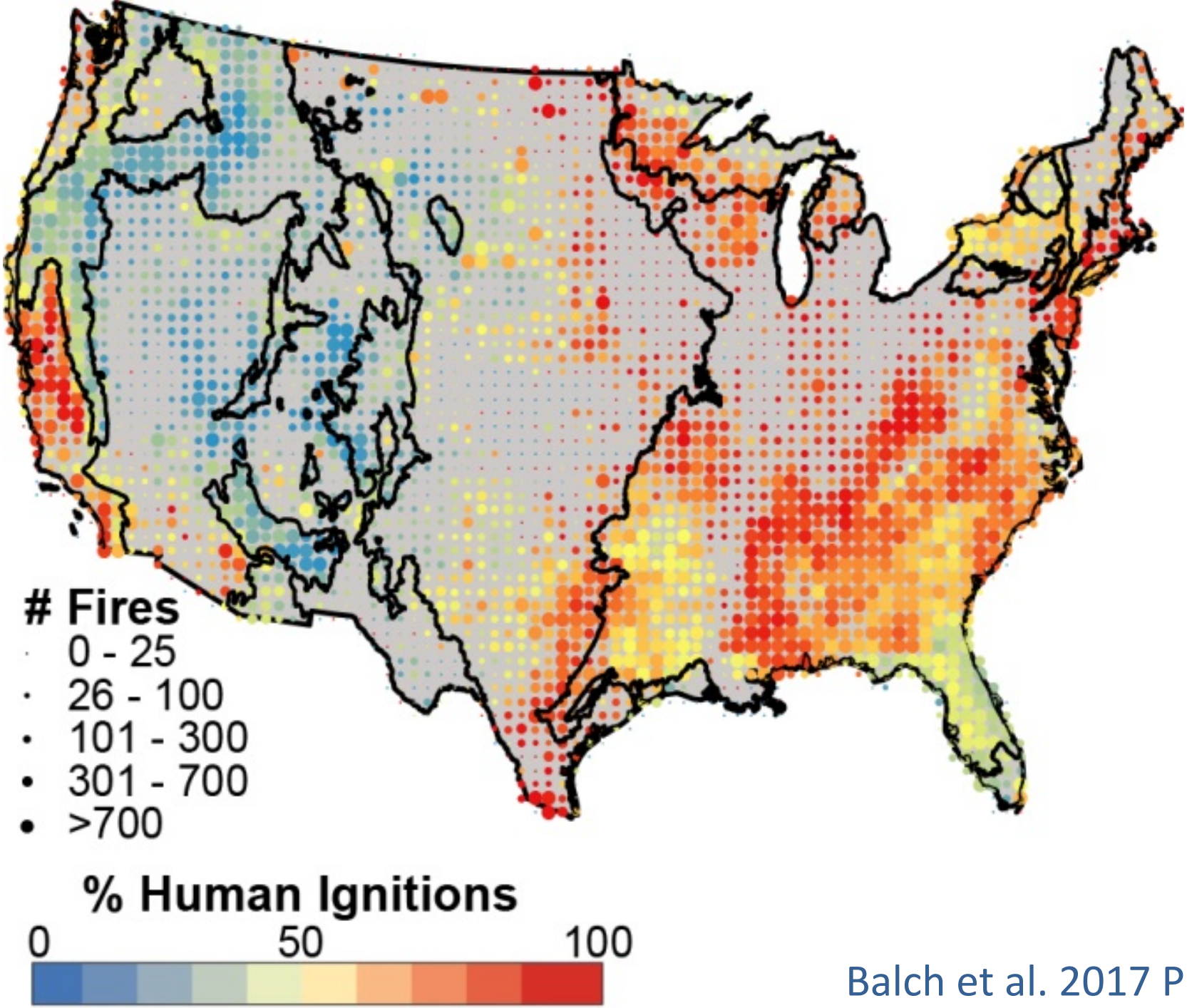
People:

- started 84% of all wildfires,
- tripled the length of the fire season,
- dominated an area seven times greater than that affected by lightning fires, and
- were responsible for nearly half of all area burned.



Balch et al. 2017 PNAS



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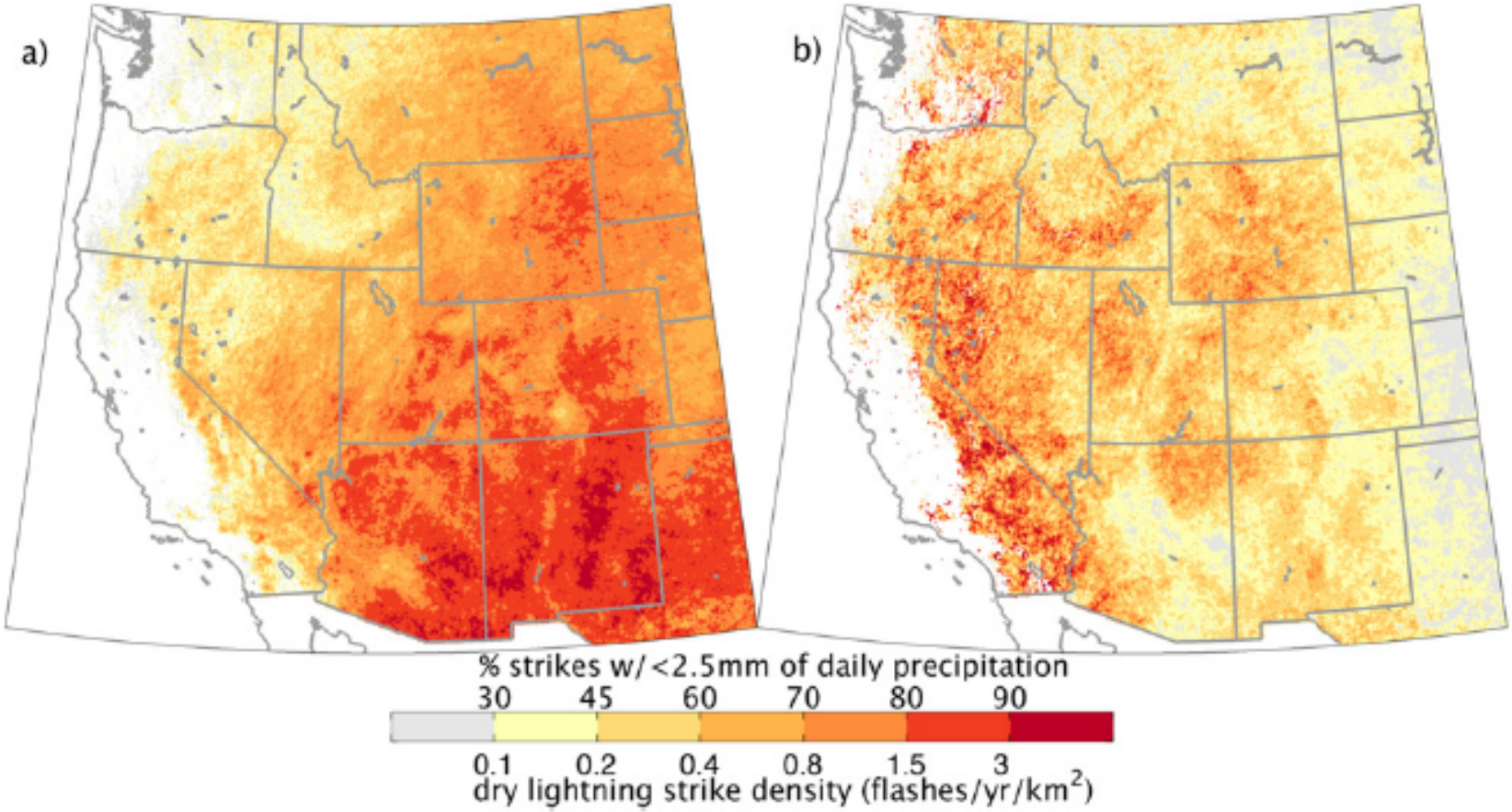
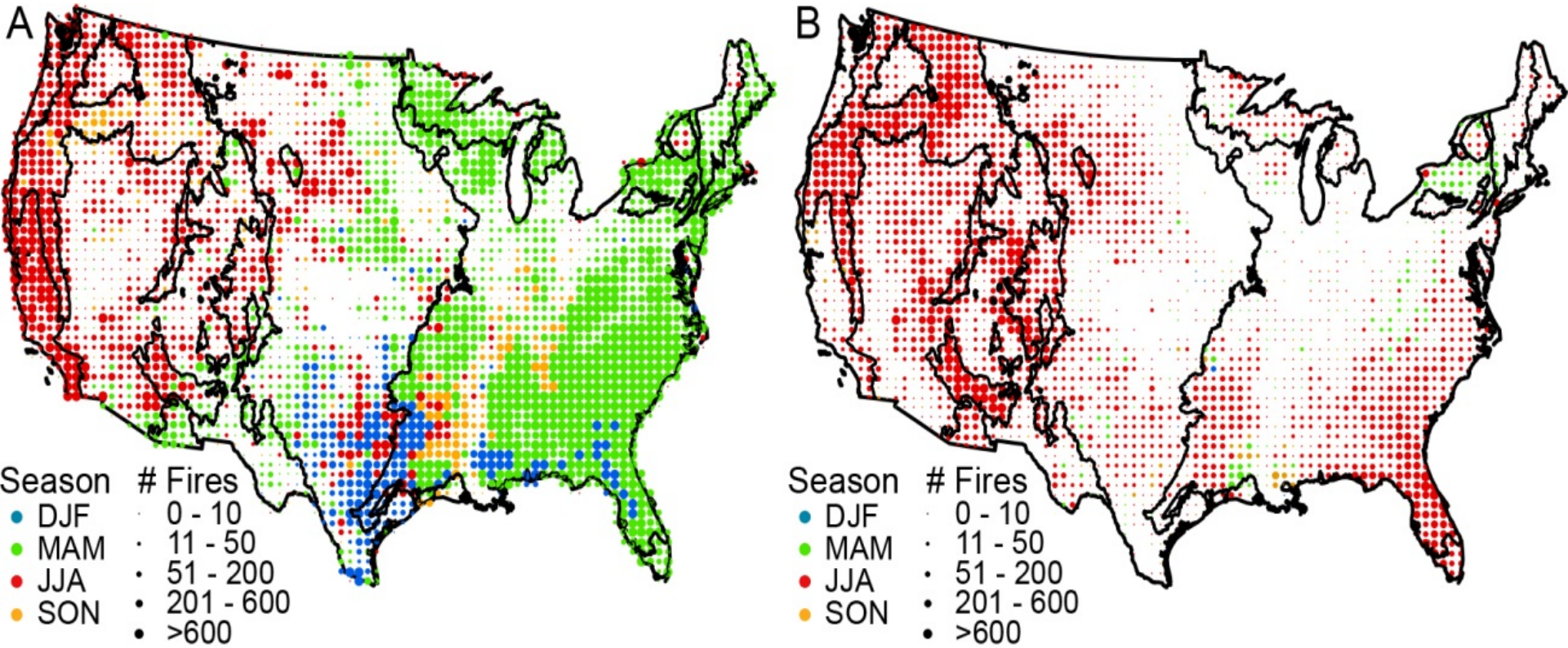
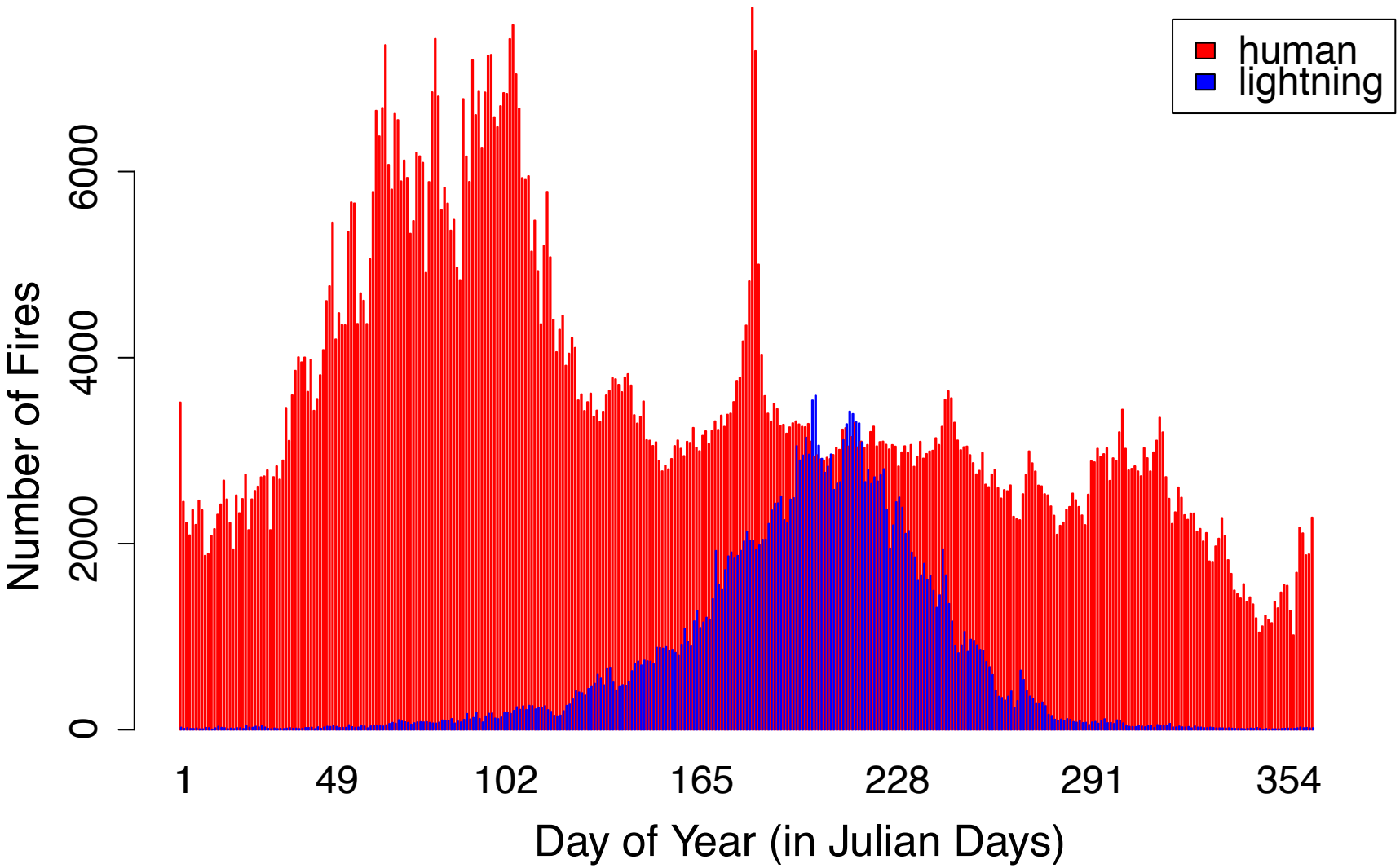


Figure 4. Density of dry lightning (a) and percent of total lightning strikes occurring as dry lightning (b) averaged over May–Oct 1992–2013 aggregated to a 1/24th degree grid. Pixels with fewer than 0.1 combined wet and dry strikes per year per km^2 are masked out.

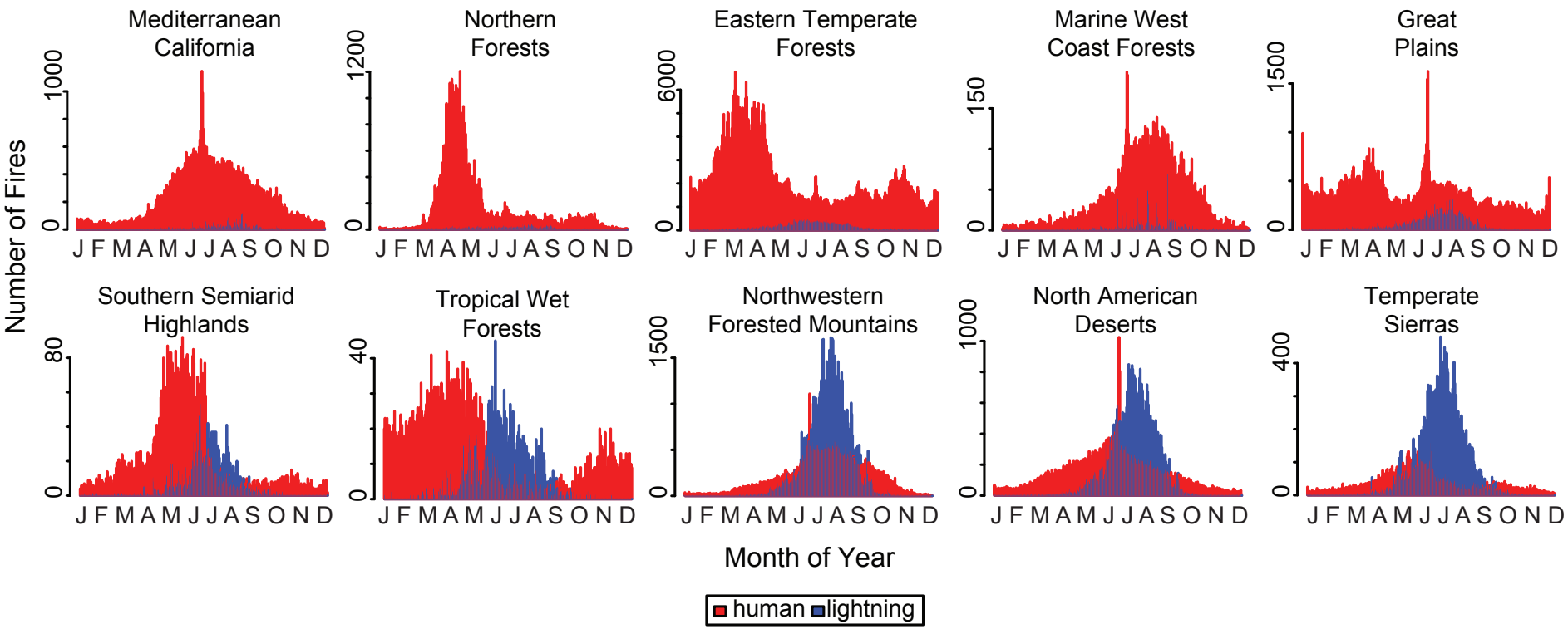
Abatzoglou et al. 2016 ERL



Balch et al. 2017 PNAS



Balch et al. 2017 PNAS



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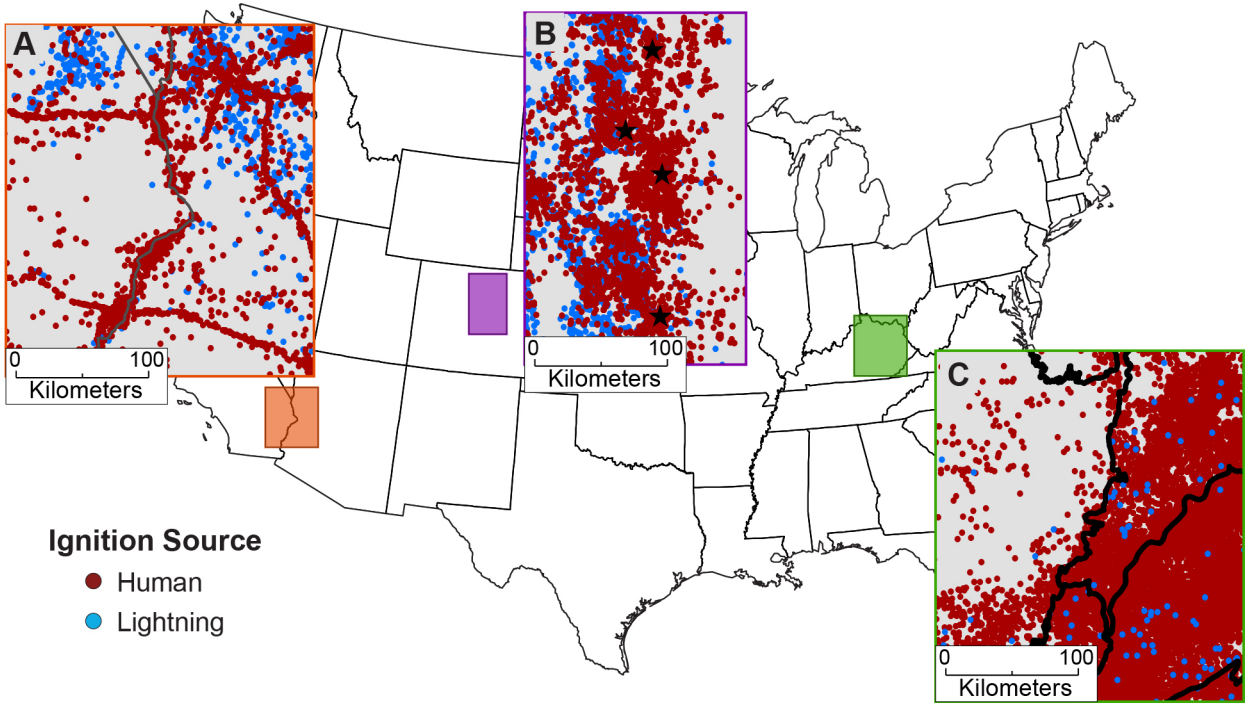
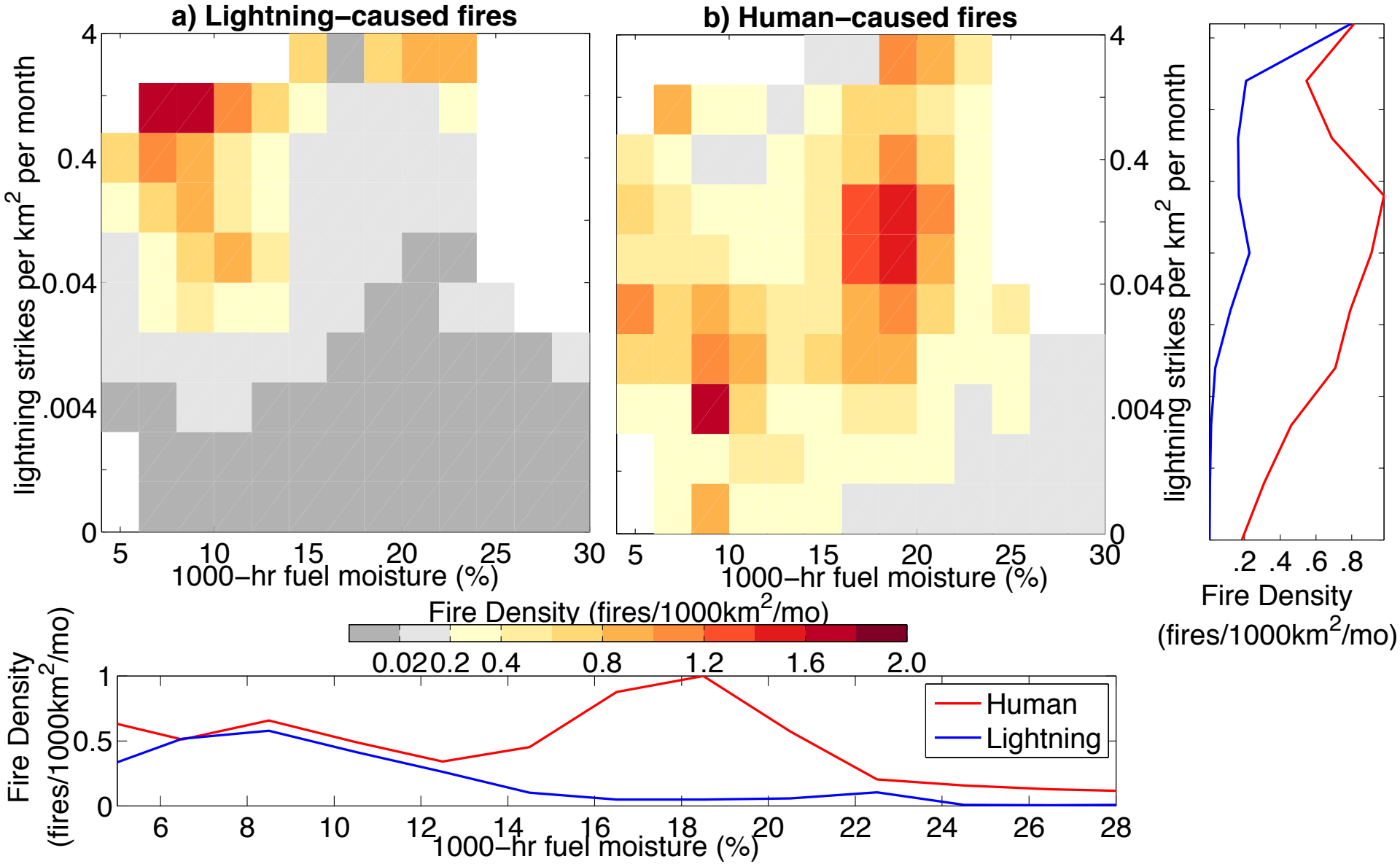


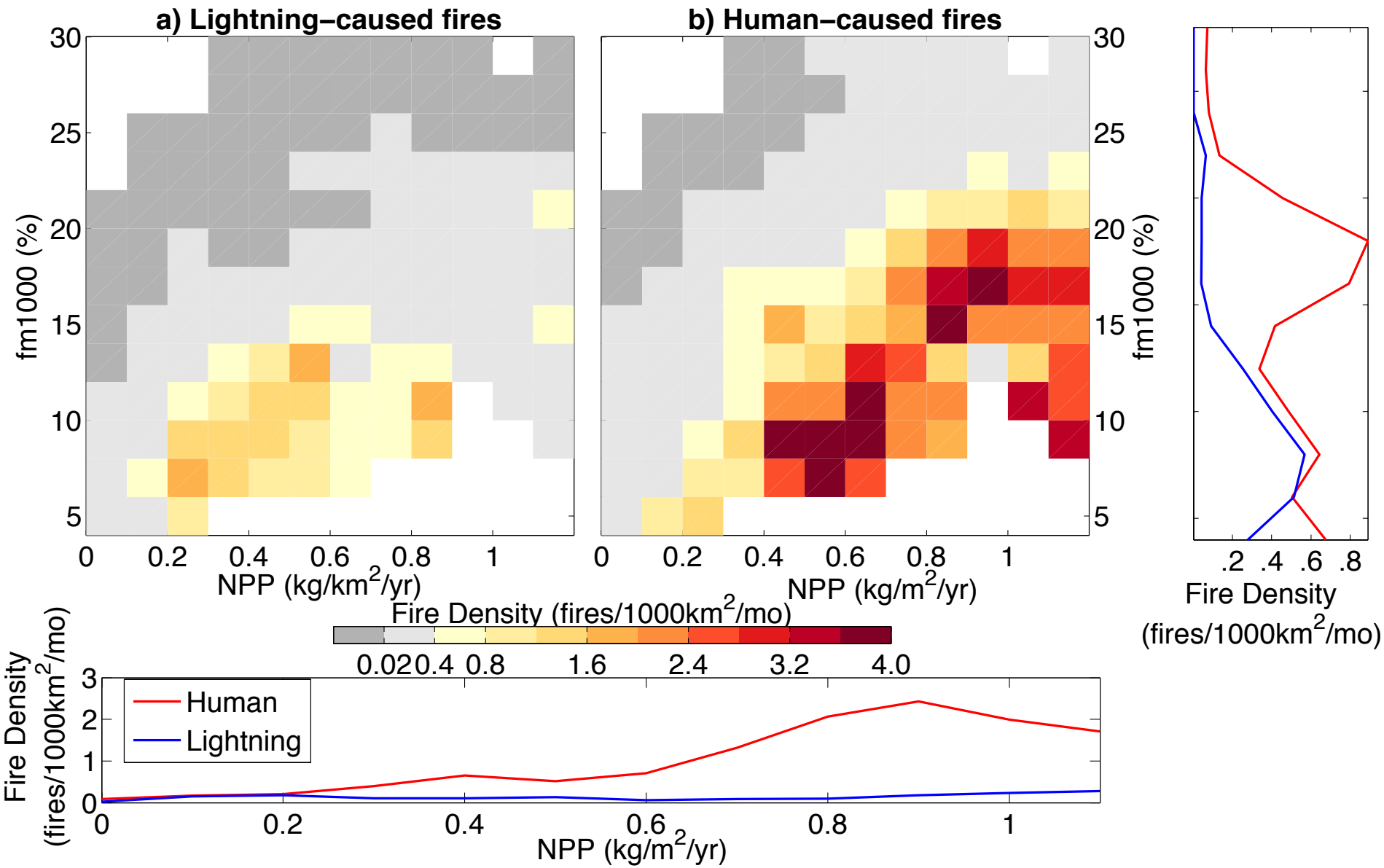
Figure 2. Spatial patterns of human ignitions (red dots) vary across the U.S. A) In the southwest, human ignitions clearly demarcate major highways and agricultural areas along the Colorado River. B) Development along the Front Range in Colorado is a source of many fires at the wildland-urban interface. Stars indicate (from north) the cities of Fort Collins, Boulder, Denver, and Colorado Springs. C) Human fires highlight the ecoregion transition to forested Appalachians, where debris burning dominates the fire signal. Black lines are ecological region level III boundaries.

Balch et al. 2017 PNAS



*NASA ASSETS: North American Land Data Assimilation System (NLDAS-2) & MODIS NPP

Balch et al. 2017 PNAS



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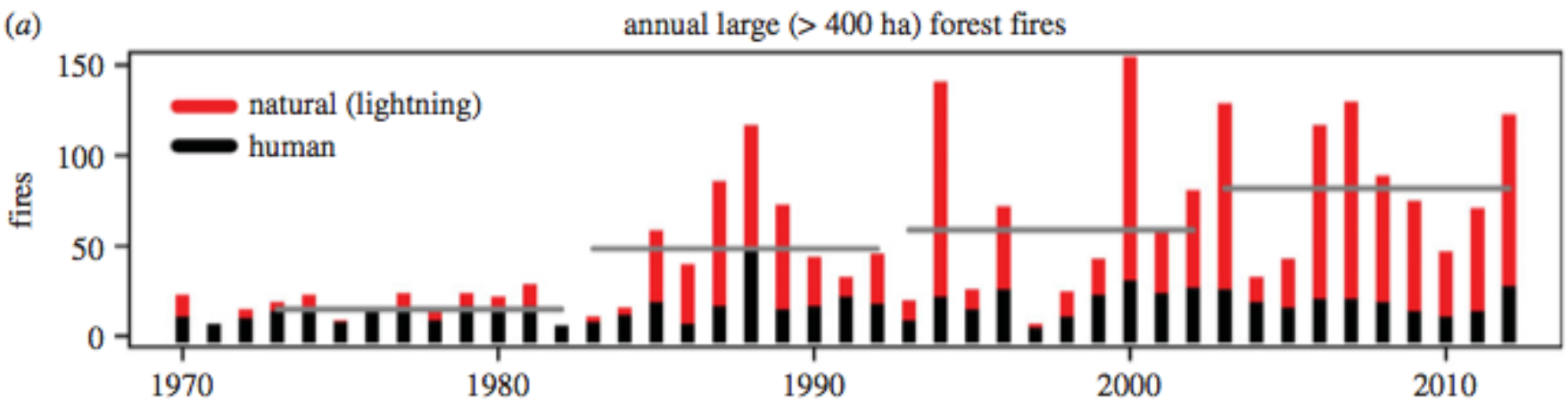
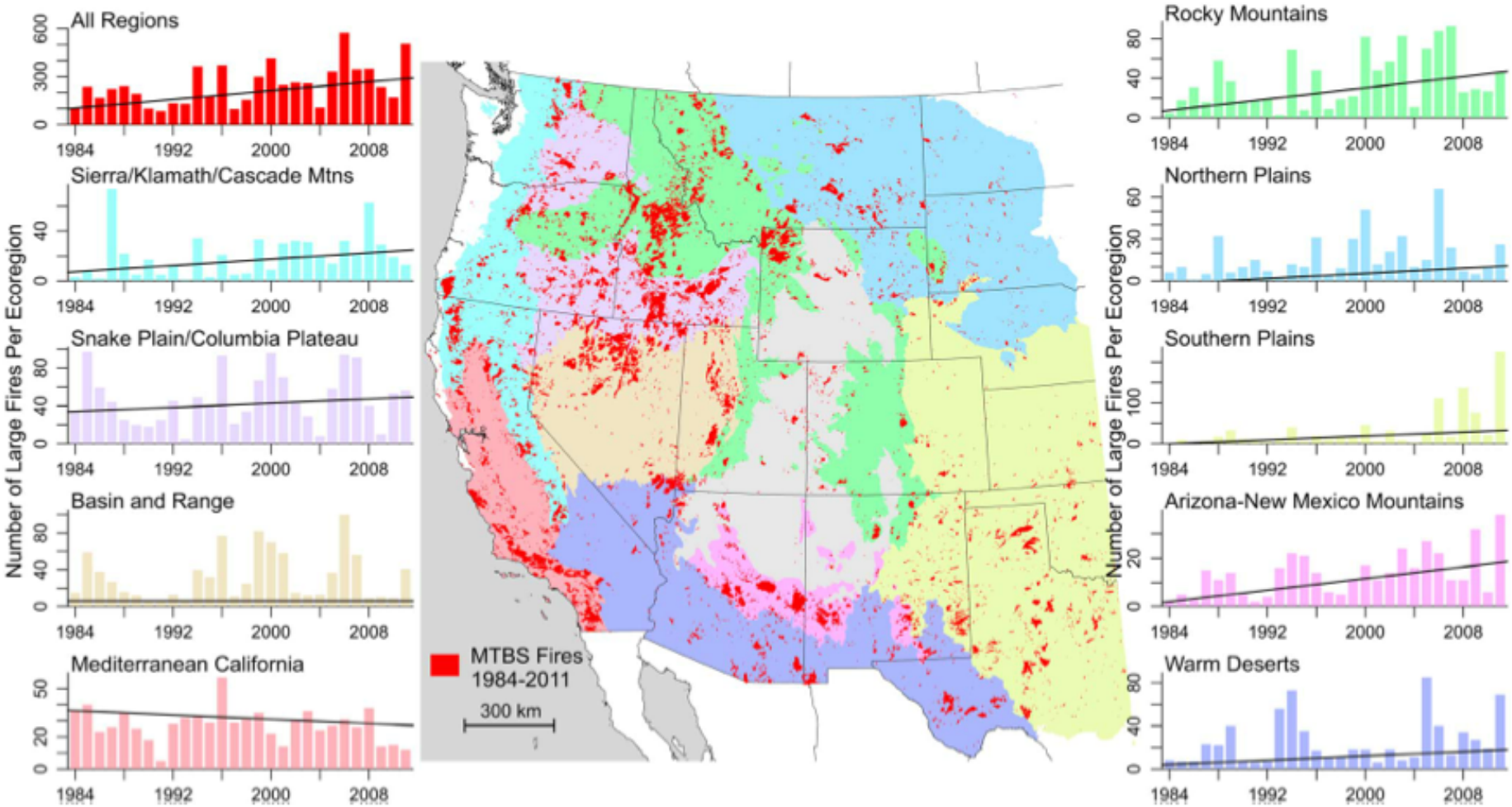
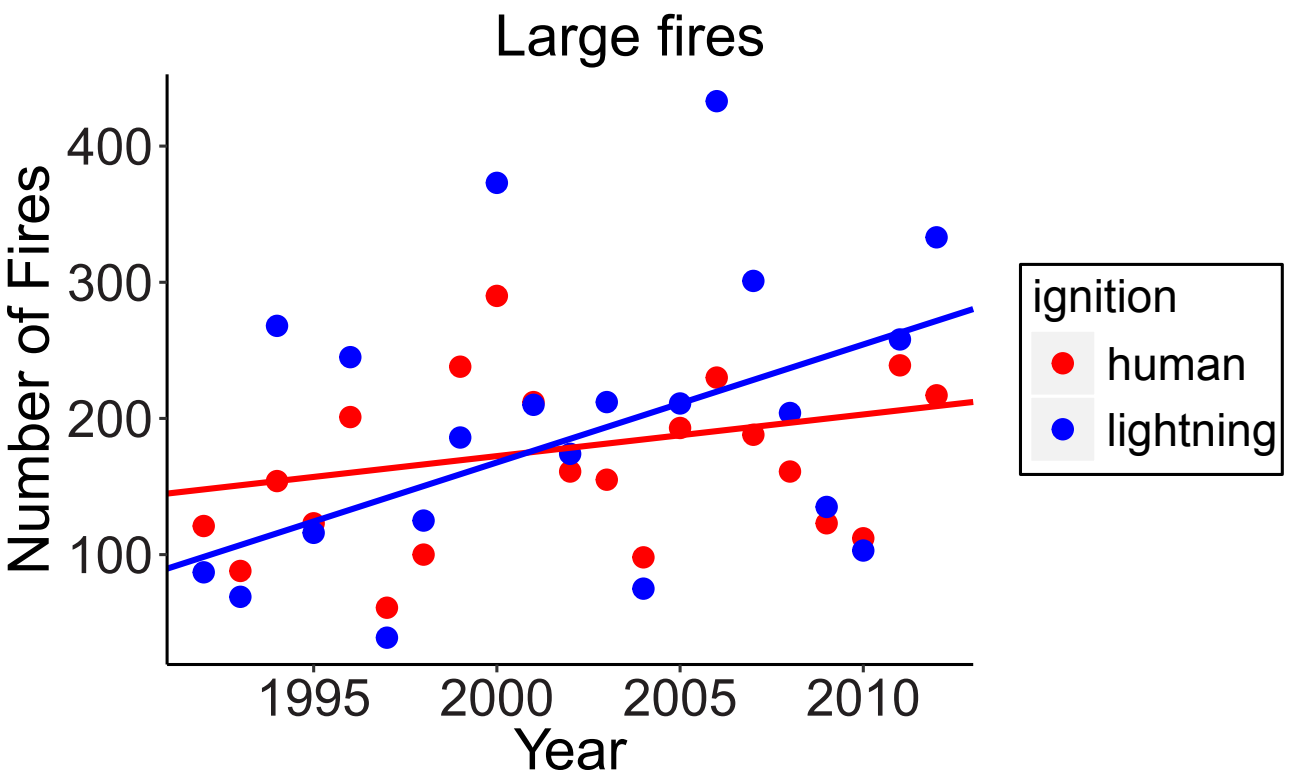


Westerling 2016 PTRS



Dennison et al. 2014 GRL



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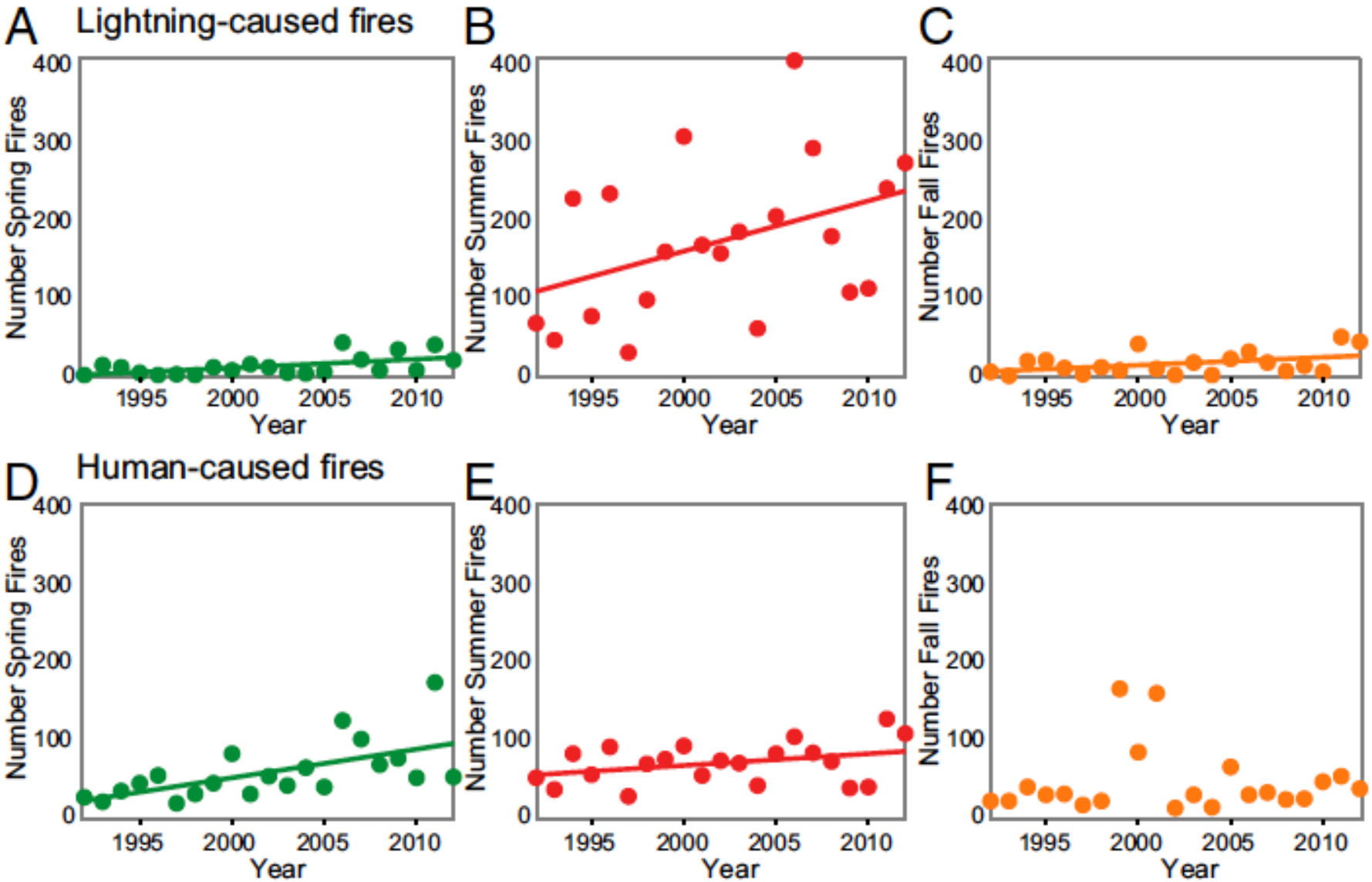

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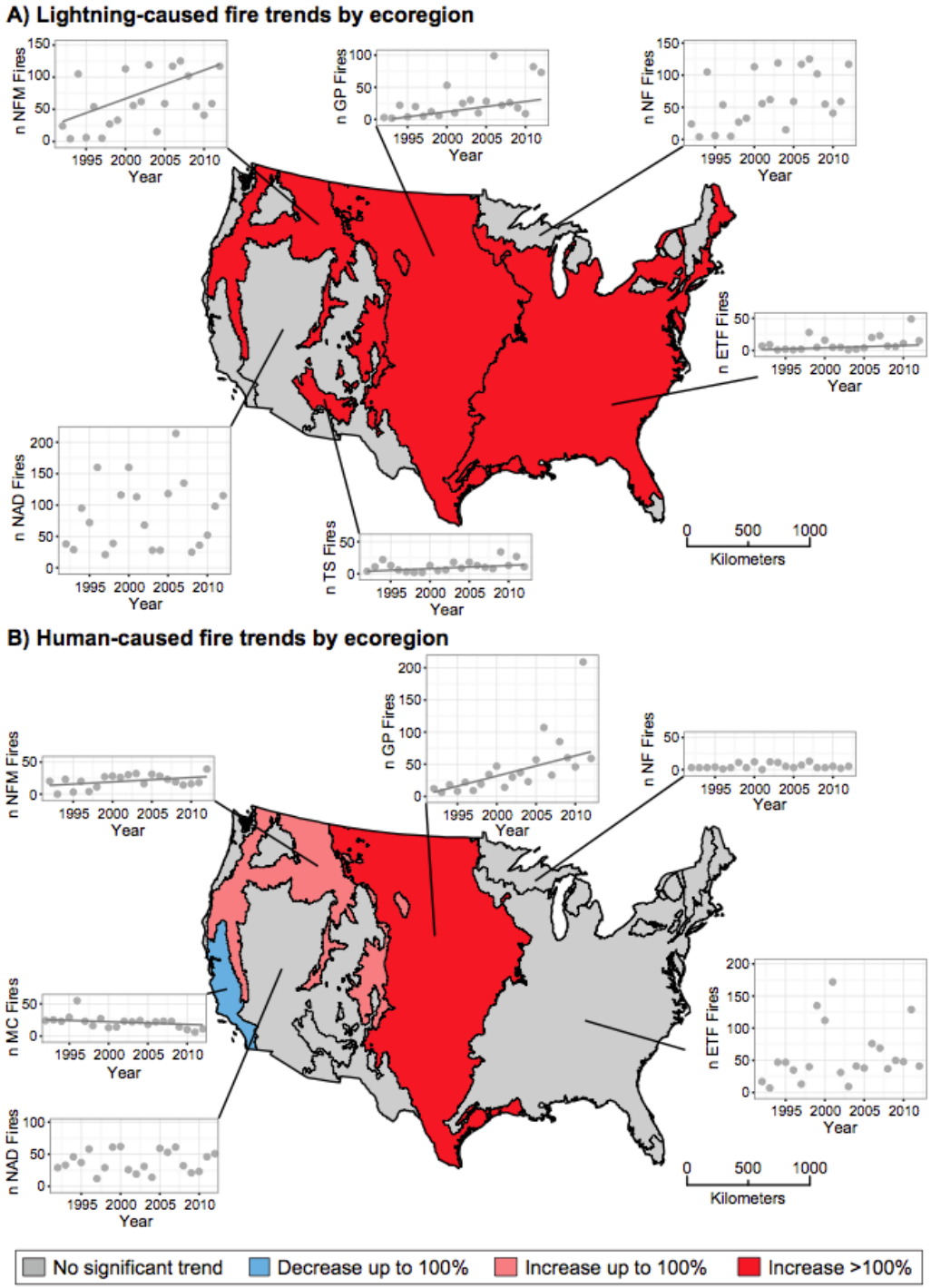

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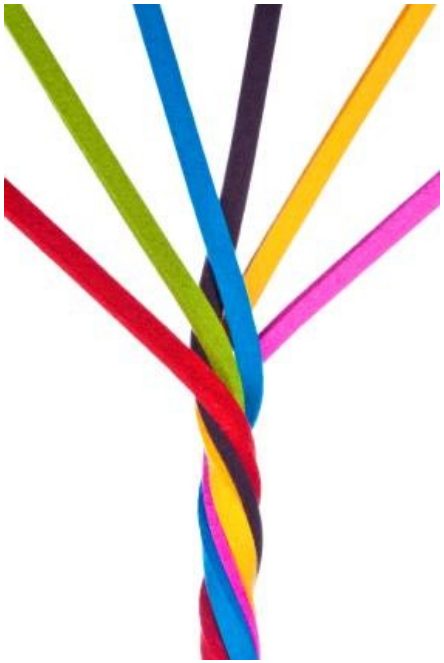

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2. Science Capital to Understand the Pace and Pattern of Global Change

3. Earth Analytics program to Educate the Next Generation