October 27, 2023

Dear Dr. Vignieri,

It is with great urgency that we present our research, a manuscript titled "The fastest growing and most destructive fires in the U.S. (2001-2020)." Recent years have seen devastating wildfires, some being the most lethal and damaging in modern U.S. history. The defining trait of these infernos? An astonishing rate of rapid growth, a dimension that, ironically, remains under-explored in the common narratives of 'megafires', which conventionally focus on size.

Our findings reveal a staggering 250% increase in the maximum fire growth rate on a single day over the last two decades (2001-2020) in the western U.S. More alarmingly, this rate stands as a significant forecaster of both the potential threat to structures and the unfortunate eventualities of their loss. There were three million structures within 4 km of a fast fire across the contiguous U.S. in the last two decades.

Harnessing the power of FIRED, a cutting-edge, satellite-sourced and regionally-tailored fire event database, our study dissects the daily fire growth rates of over 60,000 fire events across the contiguous U.S. We delve deep into the spatial tapestries of growth rates across U.S. ecoregions, aiming to decode the patterns and hotspots of these rapidly-growing blazes. Furthermore, our exploration extends to measure the societal implications of these fires, particularly in terms of threatened and lost structures.

In light of recent heart-wrenching events in Colorado, California, and Hawaii, understanding the nuanced dynamics of these fast-moving fires transcends academic interest—it's a call for proactive community preparedness and informed suppression strategies. Our findings strongly advocate that when it comes to safeguarding infrastructure and orchestrating efficient evacuations, the speed of a fire's growth is arguably more critical than its sheer size.

We are confident that our manuscript will resonate profoundly with *Science's* readership. It illuminates an understudied, yet pivotal dimension of wildfires, positioning growth rate as a vital determinant of a fire's destructive potential. The research presented is original, unpublished, and is not under consideration elsewhere. Furthermore, in our commitment to open science and knowledge dissemination, the datasets employed in our study are publicly accessible via the FIRED, HISDAC-US, and ICS-209-Plus repositories.

Thank you for your consideration of this novel work, which presents the first national scale analysis of fire growth rates and documents that fires are growing faster. We are hopeful that

this research will foster greater awareness and drive informed action in our collective aim to understand and mitigate devastating wildfires.

Best regards,

Dr. Jennifer K. Balch
Director of ESIIL
& Associate Professor in the Department of Geography
University of Colorado-Boulder