Significance :

The increased incidence of wildfires since the 1990s has far reaching implications. To complement the numerous specialized papers on this topic, we present a comprehensive summary of their wide-ranging effects—the fractional loss of forests that existed in the year 2000, the carbon emissions, the drop in an index of gross primary production relative to the previous year, and the increases in aerosol concentrations. We show that the incidence of wildfires has more than doubled in the boreal forests and in the forests of western United States and southwestern Canada since the year 2000. At least part of the increase is due to warming and drying associated with human-induced climate change. Half the forests in core regions of forest loss in Siberia and western Canada have already burned and if burning continues at the current rate of about 1% per year, the old growth trees, which account for most of the carbon storage in the boreal forests, will be half gone by the year 2060.
(This is joint work with Chan-Pang Ng, Jinhyuk Kim, Aodhan Sweeney and Siyu Zhao.)