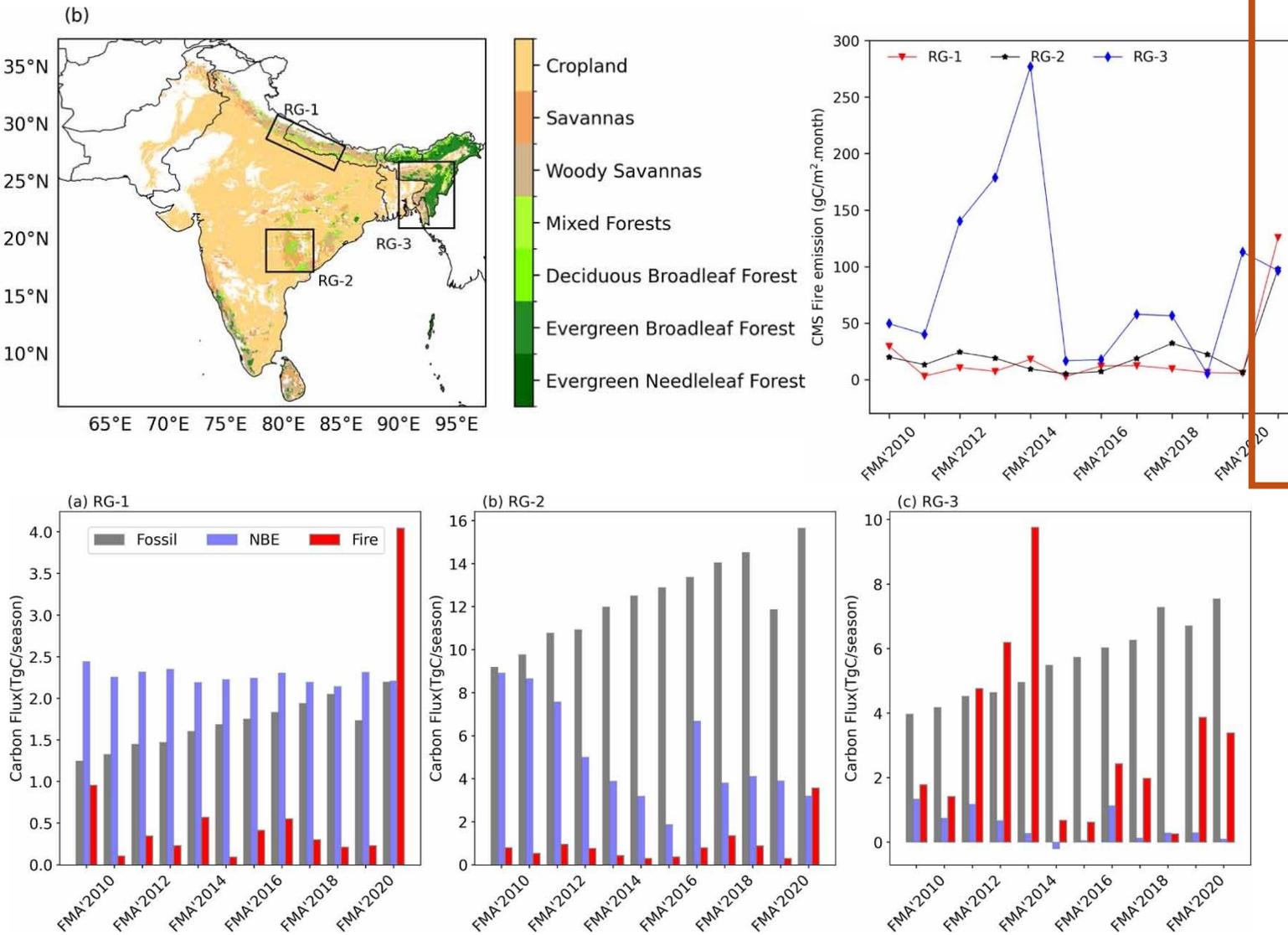


Regional fire dynamics and its contributions to carbon flux variability in South Asia, prepared by Junjie Liu



Science or Technology Question: India has faced several anomalous forest fires in recent years, notably the widespread 2021 fire. Limited study investigated long term variability of forest fires and its dynamics over South Asia (SA). This study filled this knowledge gap by investigating forest fire drivers, carbon emissions, and impacts on the carbon budget during 2010–2021 in SA, with a focus on the 2021 fire season.

Data & Results: This study quantified the fire emissions over three regions using CMS-Flux top-down fire emission estimates, and investigated the environmental drivers for these fires. Region-1 (RG-1) and RG-2 had the largest fire emissions in 2021. In RG-1, snow-induced soil moisture deficits drive fire activity. In Region-2, human activities, likely cropland burning, contributed to the forest fire. In Region-3, the scattered distribution of burned areas hints that human activity is the likely cause of the forest fire.

Significance: This analysis highlights the critical role of forest fires in the carbon budget in SA, the ecosystem health, and the need for better forest carbon management.

South Asia had the largest fire emissions in 2021 over cropland and mixed forest, significantly contributing to regional carbon budget.