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Supplement of

The impacts of biomass burning activities on convective systems over the Maritime Continent

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Table S1. The averaged daily rainfall ($\text{mm } 24\text{hr}^{-1}$) of FFBB and FF for strong and weak convections during fire periods over the Sumatra region (r1) and Borneo region (r2). Parentheses in the third column show the difference in percentage of FFBB to FF (i.e. $(\text{FFBB}-\text{FF})/\text{FF} \times 100\%$).

Rainfall ($\text{mm } 3\text{hr}^{-1}$)	FF in r1	FFBB in r1	FF in r2	FFBB in r2
Strong convection ($>1.25 \text{ mm } 3\text{hr}^{-1}$)	15.40 ± 6.09	$15.51 \pm 6.21 (+0.7\%)$	16.64 ± 5.57	$16.63 \pm 4.61 (-0.1\%)$
Weak convection ($<1.25 \text{ mm } 3\text{hr}^{-1}$)	6.28 ± 2.09	$6.47 \pm 2.23 (+3.0\%)$	4.05 ± 3.06	$4.57 \pm 3.17 (+12.7\%)$

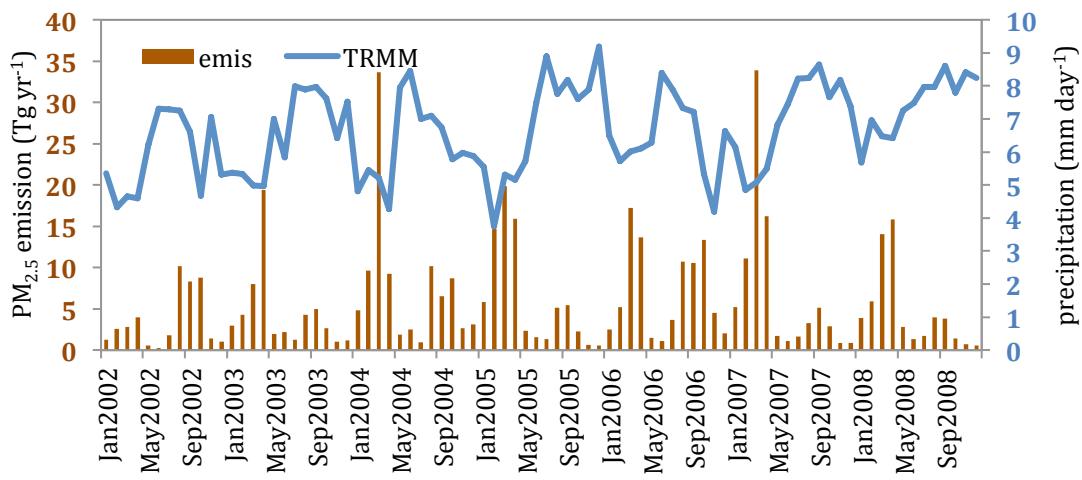


Figure S1. Time series of domain-averaged monthly PM_{2.5} emission (Tg yr⁻¹) from FINNv1.5 and precipitation rates (mm day⁻¹) from TRMM from 2002 to 2008.

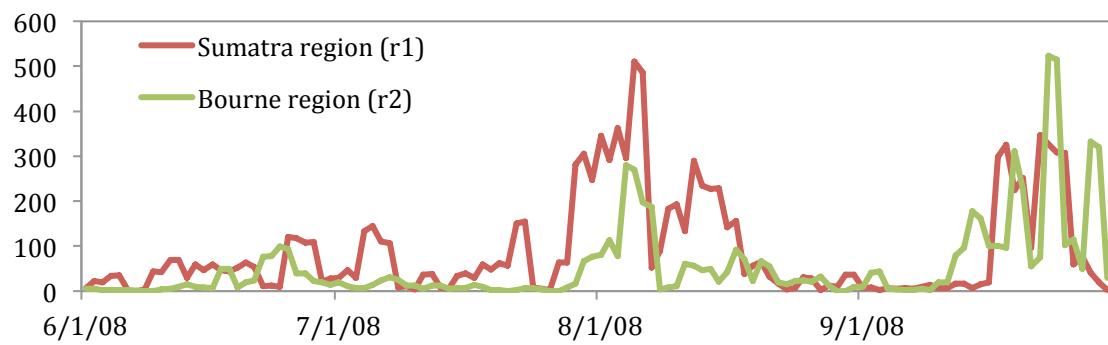


Figure S2. Time series of daily FINNv1.5 fire counts of two study regions based on domain 2 resolution (5 km) from June 1 to September 30, 2018.

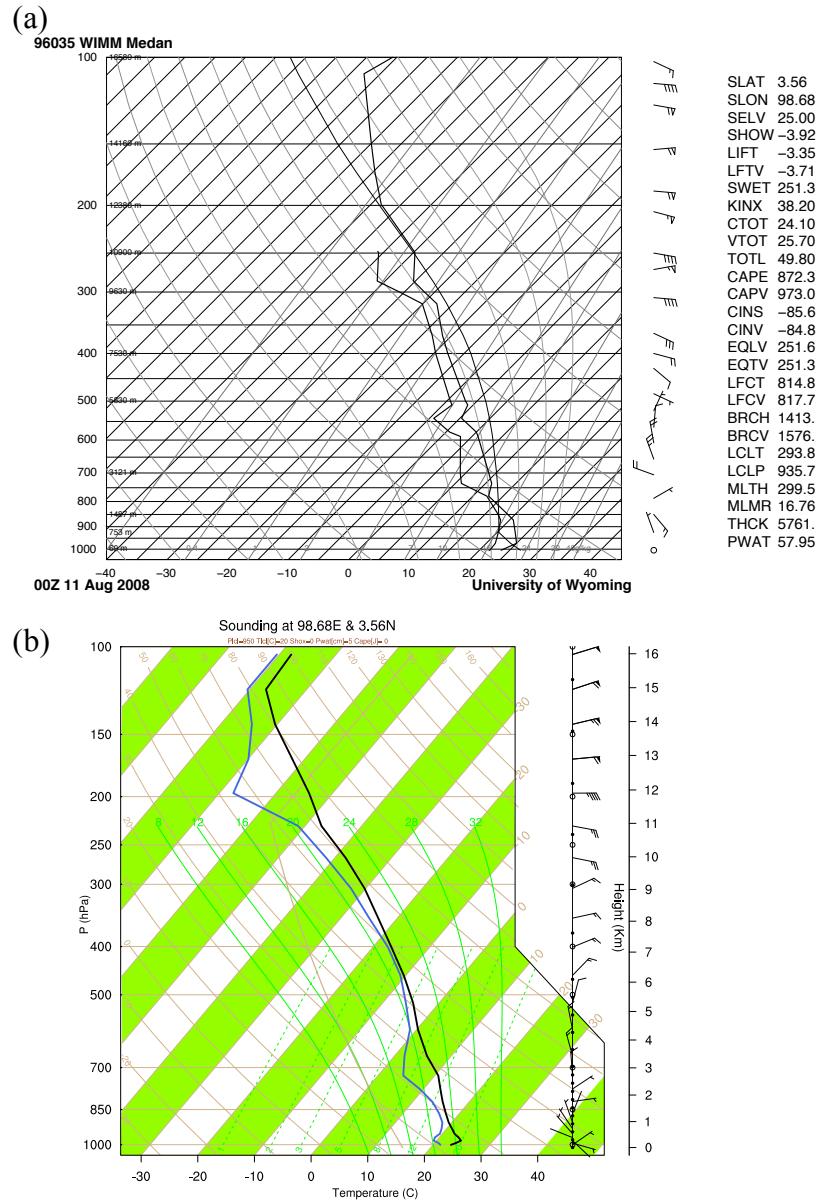


Figure S3. (a) Sounding profile observed at Medan, Indonesia (98.68° E, 3.56° N) at 00 UTC on 11 August 2008. (b) Modeled sounding profile in FFBB at the same location and time as (a).

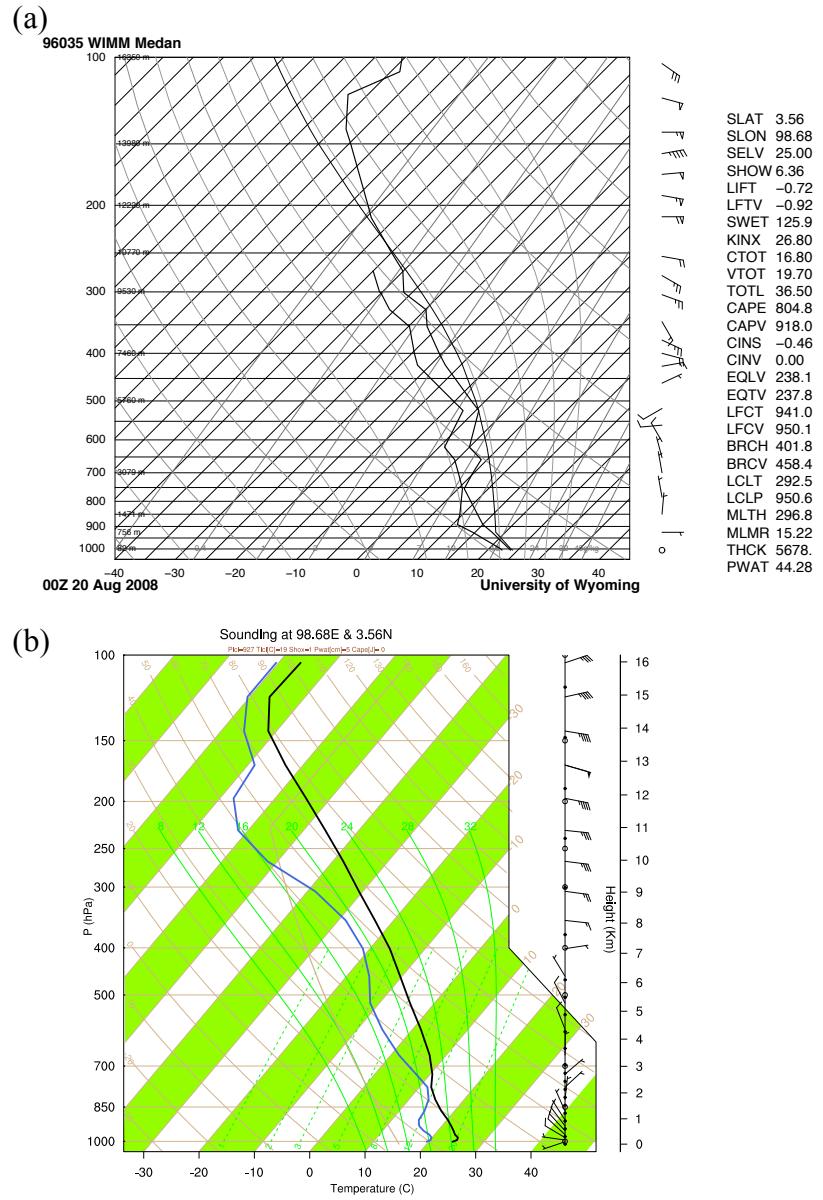


Figure S4. (a) Sounding profile observed at Medan, Indonesia (98.68° E, 3.56° N) at 00 UTC on 20 August 2008. (b) Modeled sounding profile in FFBB at the same location and time as (a).

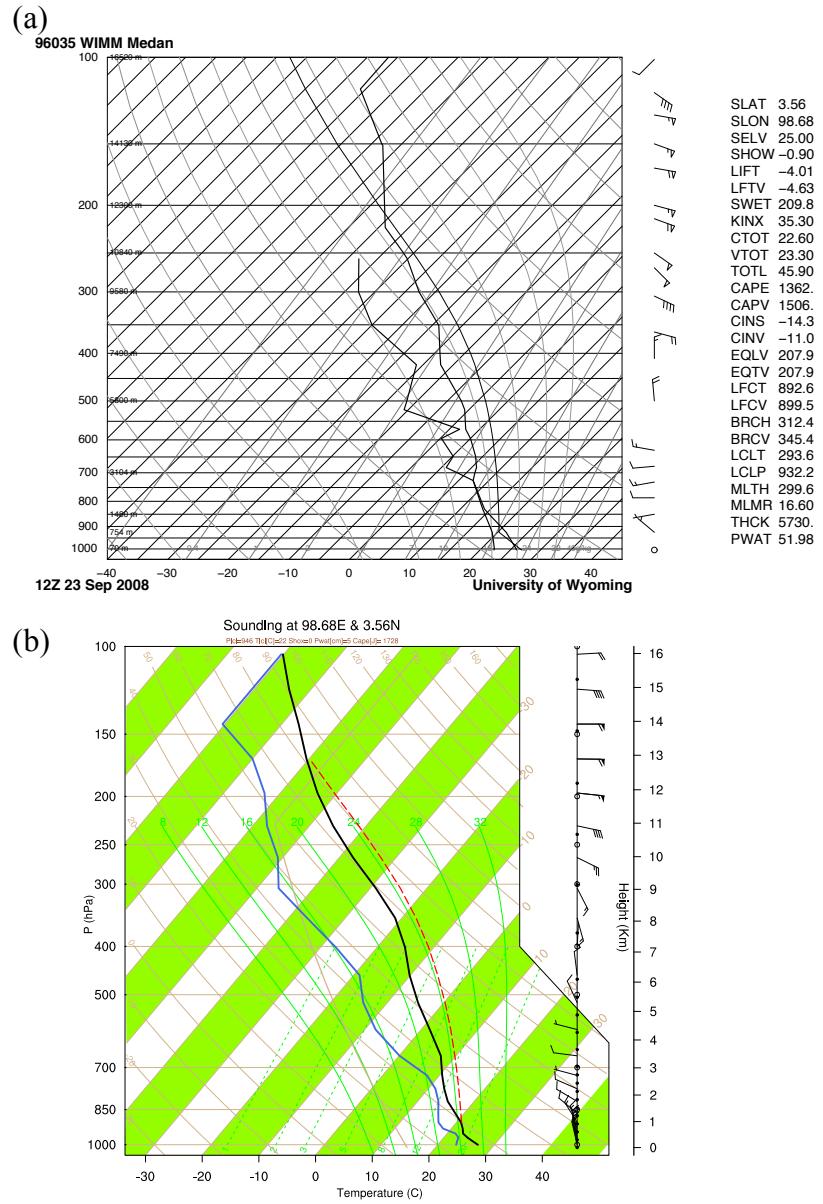


Figure S5. (a) Sounding profile observed at Medan, Indonesia (98.68° E, 3.56° N) at 12 UTC on 23 September 2008. (b) Modeled sounding profile in FFBB at the same location and time as (a).

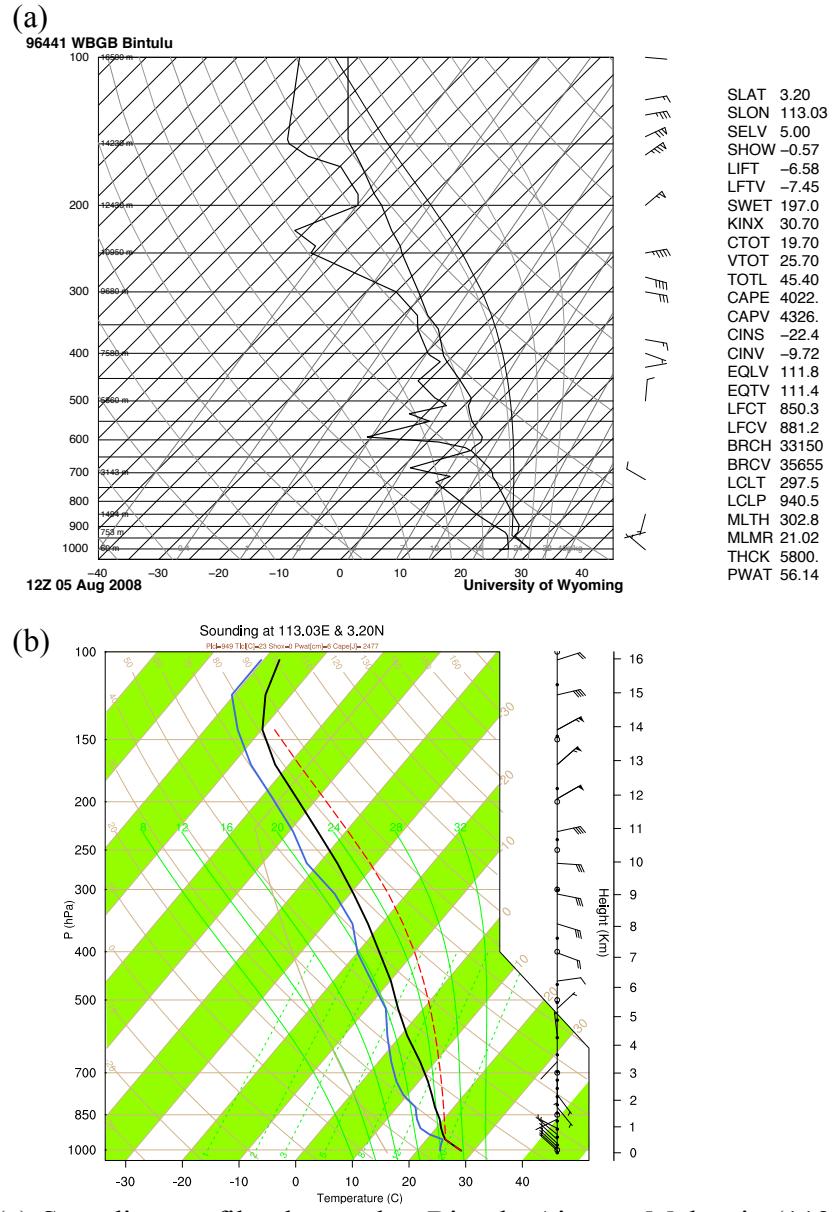


Figure S6. (a) Sounding profile observed at Bintulu Airport, Malaysia (113.03° E, 3.20° N) at 12 UTC on 05 August 2008. (b) Modeled sounding profile in FFBB at the same location and time as (a).

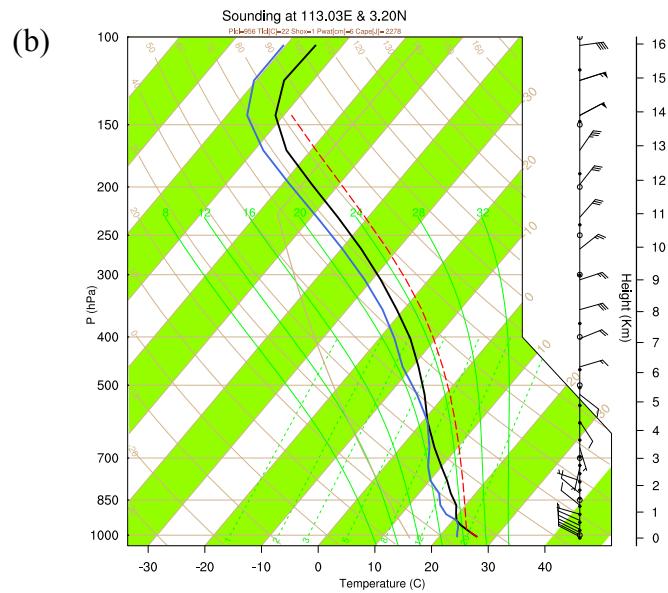
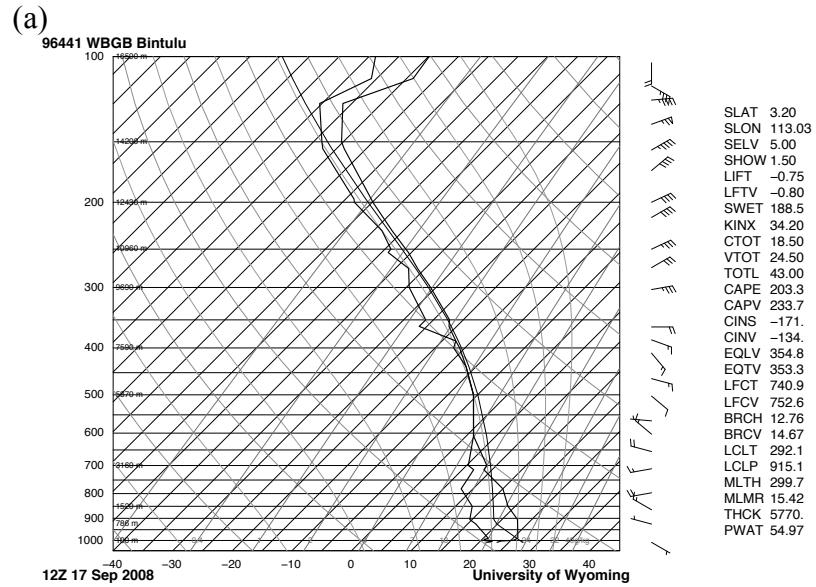
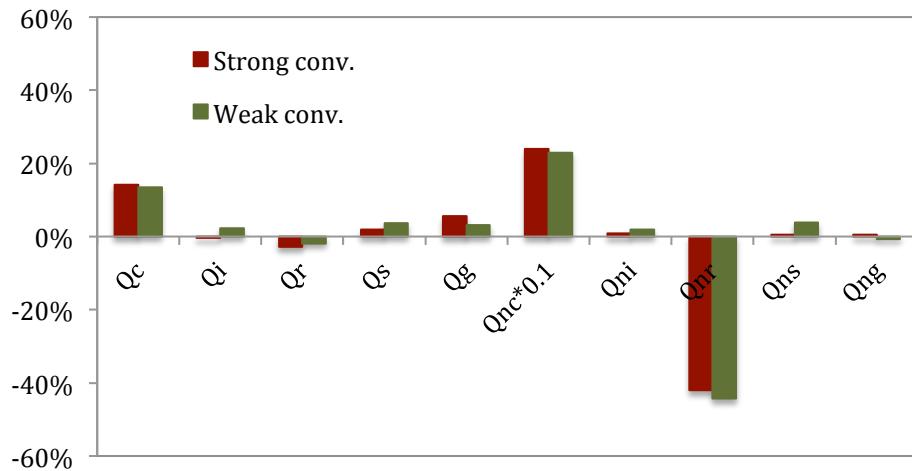


Figure S7. (a) Sounding profile observed at Bintulu Airport, Malaysia (113.03° E, 3.20° N) at 12 UTC on 17 September 2008. (b) Modeled sounding profile in FFBB at the same location and time as (a).

(a) Sumatra region (r1)



(b) Borneo region (r2)

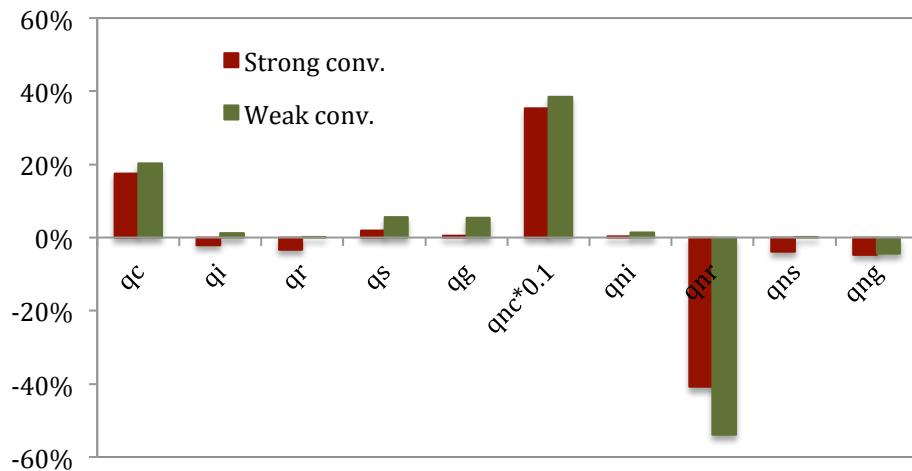


Figure S8. The mean differences in percentage of FFBB to FF (i.e., $(\text{FFBB}-\text{FF})/\text{FF} \times 100\%$) over strong and weak convective events during the fire periods in (a) the Sumatra region (r1) and (b) the Borneo region (r2). Q_c , Q_i , Q_r , Q_s and Q_g represents cloud, ice, rain, snow, and graupel mass concentration, respectively. Q_{nc} , Q_{ni} , Q_{nr} , Q_{ns} and Q_{ng} means number concentration for each hydrometeor.