Figure S1. Spatial distribution of summertime Standardized Precipitation Evapotranspiration Index (SPEI) with 3-month timescale from 2014 to 2018.
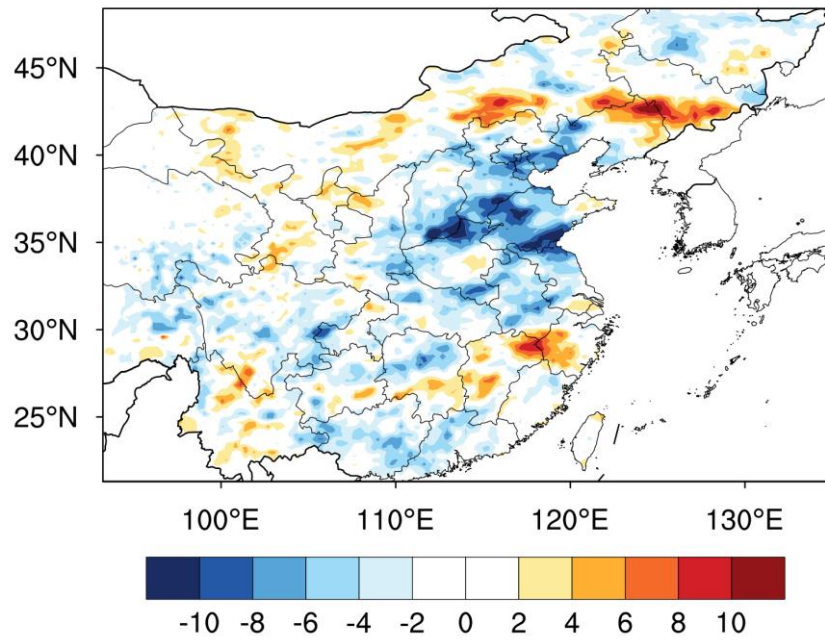
Figure S2. Spatial distribution of the change in downward solar radiation (W m^{-2}) in IRR relative to NOIRR.
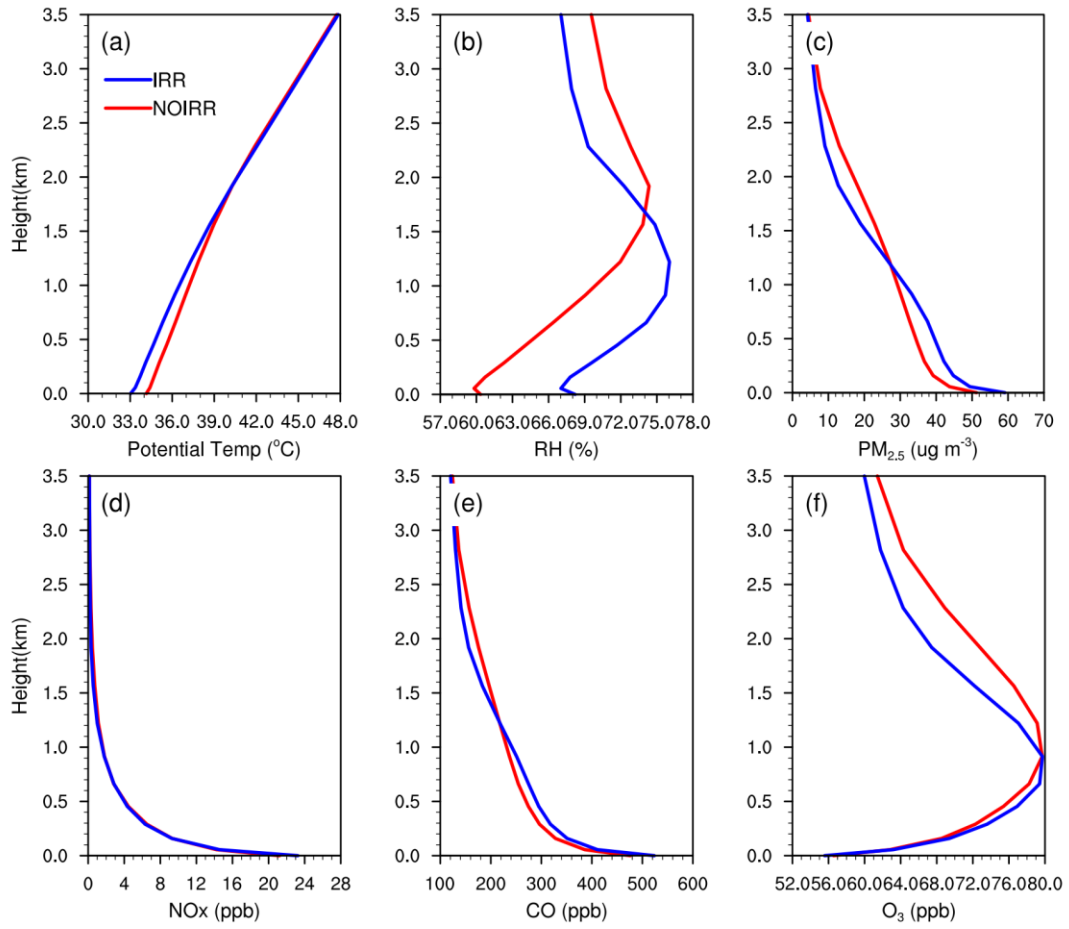
Figure S3. Vertical profiles of daily average potential temperature (°C), RH (%), $PM_{2.5}$ (µg m^{-3}), NO_x (ppb), CO (ppb) and O_3 (ppb) from IRR (blue lines) and NOIRR (red lines) in Chengdu.
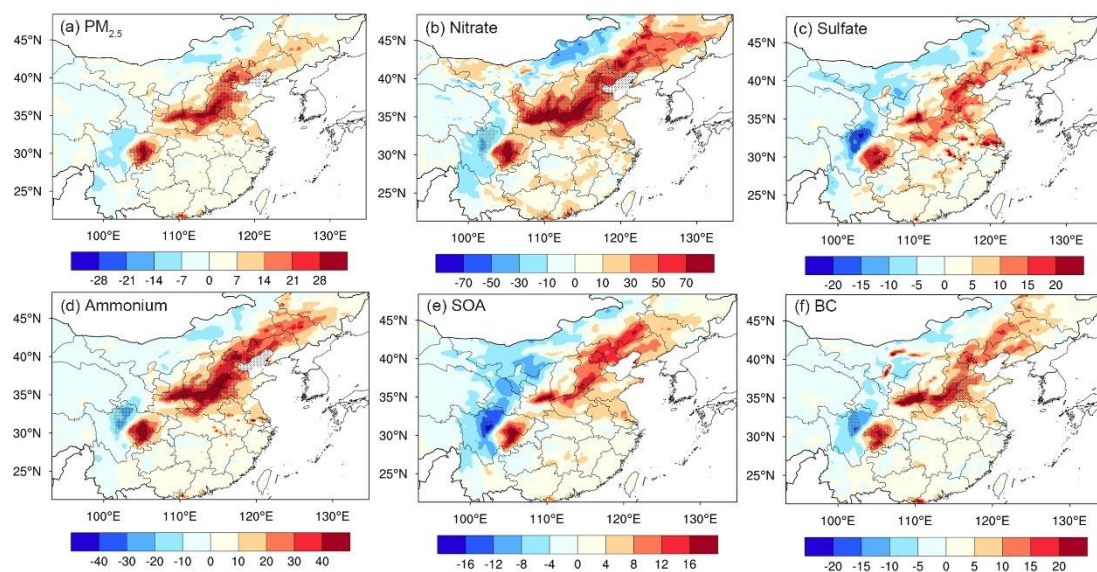
Figure S4. Spatial distribution of changes (%) in $PM_{2.5}$, nitrate, sulfate, ammonium, SOA and BC in IRR relative to NOIRR during the summer of 2017. Dotted area indicates the changes are statistically significant at 95% confidence level using two-tailed Student's *t*-test.
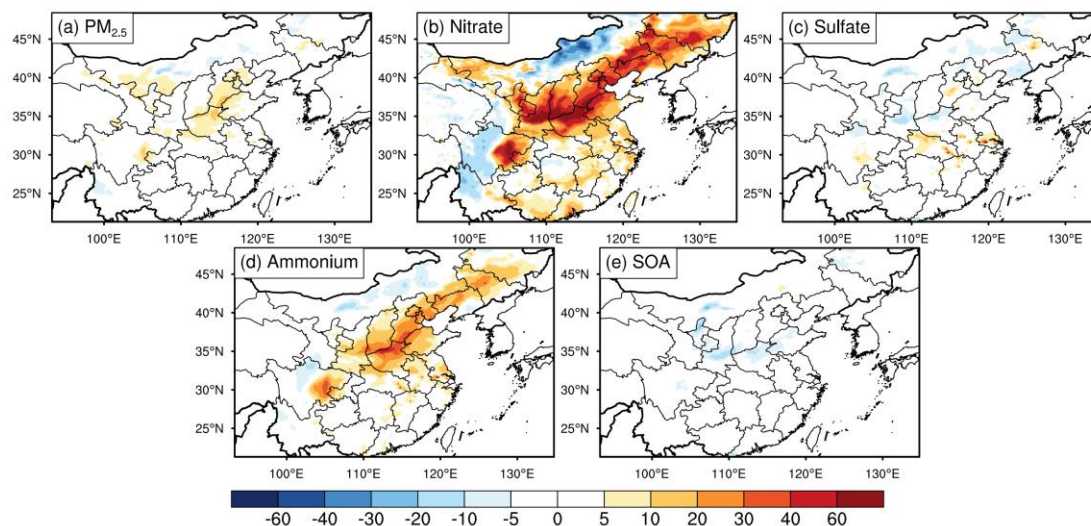
Figure S5. Contribution (%) of secondary formation to the increase in (a) $PM_{2.5}$ and (b–e) secondary components (nitrate, sulfate, ammonium and SOA). Contributions are calculated by subtracting the fractional changes in BC ($\triangle$BC) from the fractional changes other secondary $PM_{2.5}$ components ($\triangle PM_{2.5}$), i.e., $\triangle PM_{2.5} - \triangle BC$.
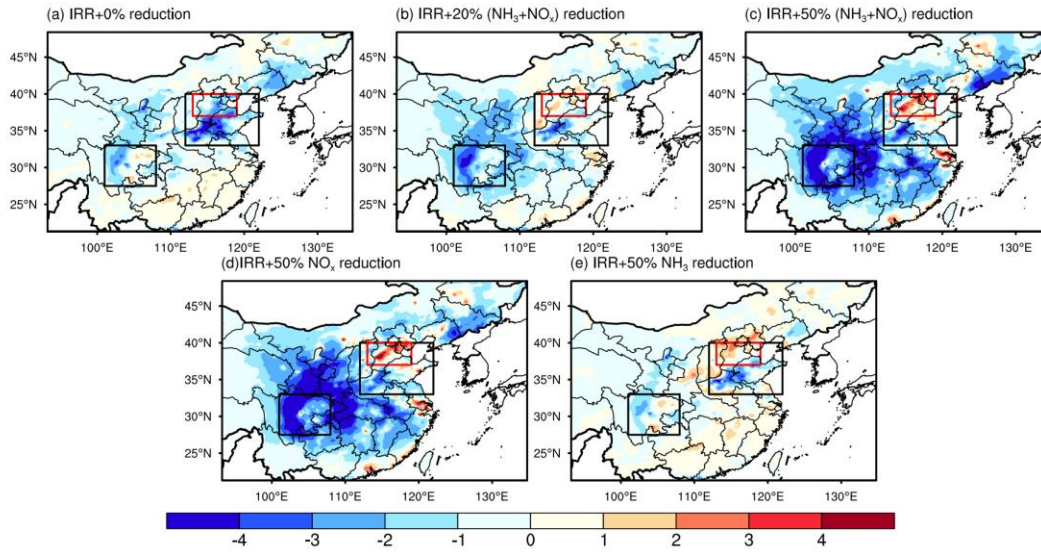
Figure S6. Spatial distribution of changes in nighttime ozone (ppb) in (a) IRR, IRR with (b) 20 % and (c) 50 % combined emission reduction of NO_x and NH_3, 50 % individual emission reduction of (d) NO_x and (e) NH_3, relative to NOIRR during the summer of 2017. Black squares indicate North China Plain and Sichuan Basin, respectively. Red square is the city cluster of Beijing-Tianjin-Hebei region (BTH).