

1 *Biogeosciences*
2 *Supporting Information for*
3 **CO₂, CH₄, and N₂O Emissions from Urban Lawns in**
4 **Southern China: Characteristics and Driving Mechanisms**
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18 **Content of this file**
19 Flux calculation method and Figure S1-S2.

GHG fluxes were calculated using Equation (1):

$$F = \frac{\Delta m}{A \cdot \Delta t} = \rho_0 \cdot \frac{P}{P_0} \cdot \frac{T_0}{T} \cdot \frac{V}{A} \cdot \frac{\Delta c}{\Delta t} \quad (1)$$

where F is the gas exchange flux ($\text{mg} \cdot \text{m}^{-2} \cdot \text{min}^{-1}$); Δm is the mass increment of the gas in the chamber over time t (mg); A is the basal area of the chamber (m^2); Δt is the sampling time interval (min); ρ is the gas density inside the chamber ($\text{kg} \cdot \text{m}^{-3}$); V is the chamber volume (m^3); Δc is the increment in gas concentration over time t (ppm); ρ_0 is the standard gas density ($\text{kg} \cdot \text{m}^{-3}$); P_0 (= 101.325 kPa) and T_0 (= 273.15 K) are the pressure and absolute temperature under standard conditions, respectively; and P and T are the atmospheric pressure at the sampling site and the absolute temperature inside the static chamber.

Strict data quality control was implemented for all flux datasets. First, chamber fans operated throughout sampling to maintain well-mixed conditions and prevent vertical stratification. Second, concentration–time trends were visually inspected, and sequences with obvious non-linear drift or abnormal outliers were discarded. Third, the regression standard error was recorded for each flux as a reliability indicator, with R^2 serving as an auxiliary metric ($R^2 > 0.80$ generally required; lower values for low-magnitude CH_4 and N_2O were evaluated using both standard error and visual patterns rather than a rigid threshold).

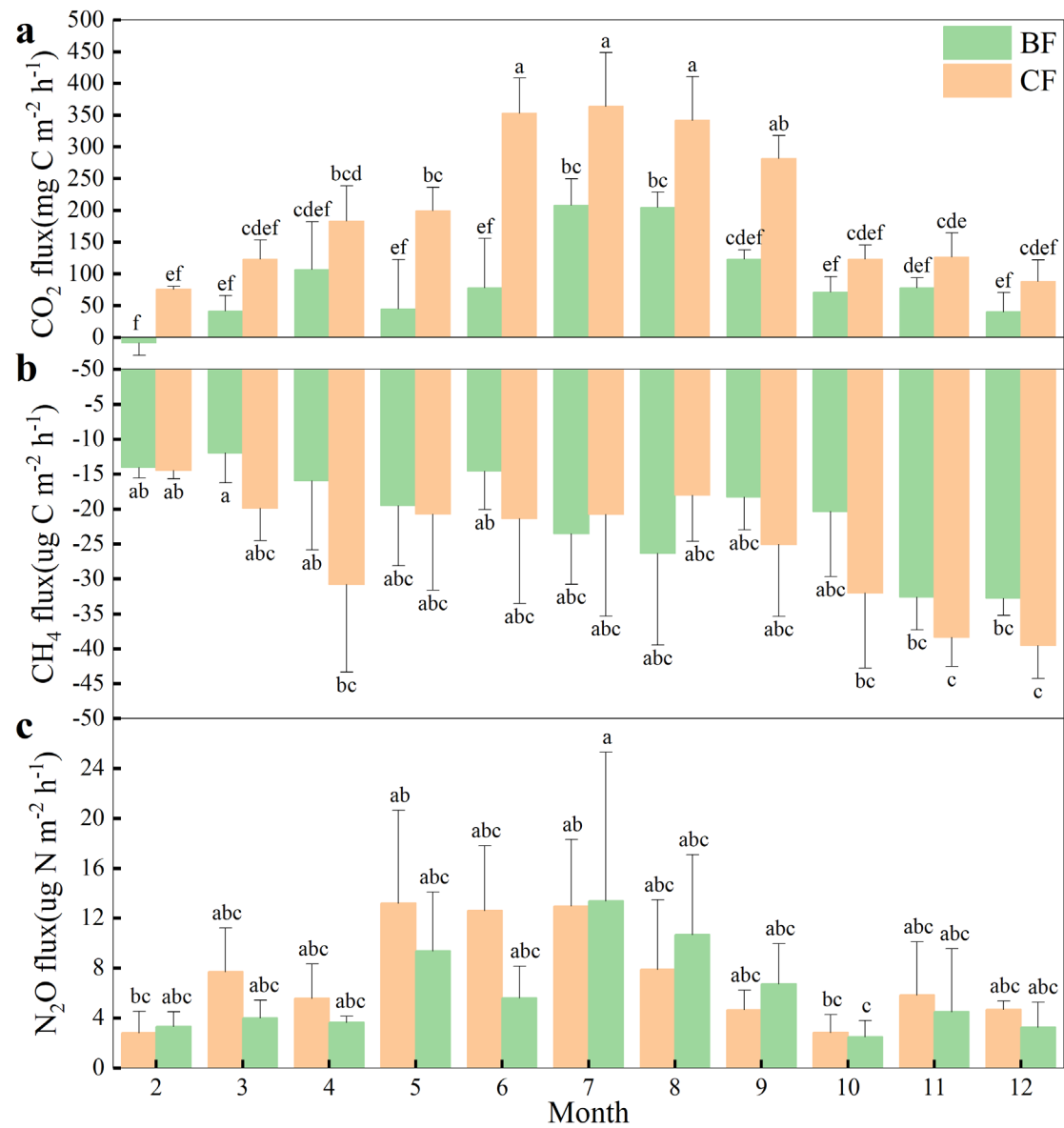


Figure S1. Monthly average fluxes of CO₂ (a), CH₄ (b), and N₂O (c) in BF and CF urban lawns.

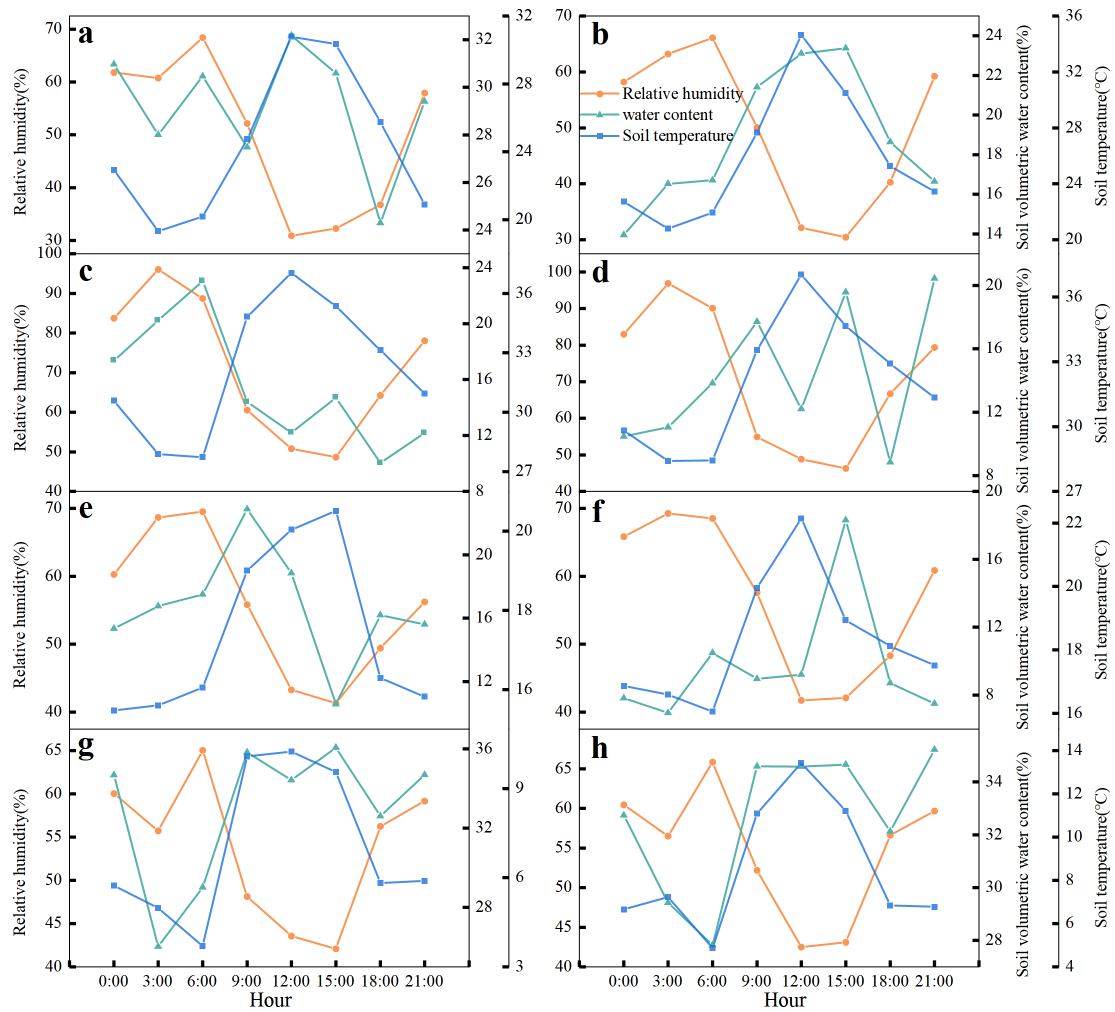


Figure S2. Diurnal variation of relative humidity, soil volumetric water content, and soil temperature in BF and CF urban lawns across different seasons. BF lawn in spring (a), summer (c), autumn (e), and winter (g), respectively; CF lawn in spring (b), summer (d), autumn (f), and winter (h), respectively.