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Title Linking photosynthesis with soil respiration: diurnal patterns across large geographical distances

Outline

The main objective of this study is to identify diurnal patterns of soil respiration (R_s) and their relationship with canopy photosynthesis. Previous studies have identified diurnal patterns of R_s decoupled with soil temperature and have interpreted it as a pattern influenced by plant photosynthesis (Tang et al 2005, Vargas and Allen in review). In addition, the decoupled patterns in R_s have shown a hysteresis effect that shifted in amplitude and direction among seasons. We propose to explore the relationship between R_s and photosynthesis among sites with different climate and vegetation type. Two main tasks of this research are: 1) identify if the decoupling of R_s from soil temperature and hysteresis effects are a general pattern across large geographical distances; and 2) explore a mechanistic explanation of diurnal patterns of R_s based on tree physiology and soil CO_2 diffusivity .

References

Tang J, Baldocchi DD, Xu L. 2005. Tree photosynthesis modulates soil respiration on a diurnal time scale. *Global Change Biology* (11), 1298-1304
Vargas R and Allen MF. In review. Continuous measurements of soil respiration before and after hurricane Wilma in a tropical forest. *Global Change Biology*