

**Title:** Temporal dynamics in gross ecosystem production, ecosystem respiration, net carbon uptake and environmental conditions among plant functional types

**Initial coordinator and proposing group:** B.E. Law, D.D. Baldocchi, M. Reichstein, D. Papale, R. Valentini, and flux tower investigators who would like to participate

In this paper, we examine daily, weekly, monthly, and interannual dynamics in GEP, Re and NEP by biome, and lags in response to environmental conditions. Questions are, (1) Does Re lag GPP on a daily to weekly basis? Do the relations and lags differ by biome? (2) How do trends in daytime Re and temperature compare with nighttime values, in light of latest IPCC report that day and night temperatures are increasing at a similar rate? (3) What are the trends in average monthly GPP, Re, and NEP over multiple years? (4) What is the mean maximum GPP/day by biome, and how does this compare with theoretical estimates? (5) What are global trends of carbon processes (GEP, Re, annual litter production, MRT) in relation to environmental variables? (6) How does mean annual Re vary by plant functional type? Global trends in environmental conditions are also examined (soil temperature, air temperature, and SWC spring/fall, day/night over ~10 yrs) to determine variation by biome and agreement with previous research (winter chill, day vs night air temperature, summer soil moisture).

Sites: all with relatively long-term data (5yr+)

Rules for co-authorship: contribution of data and intellectual input to analysis and writing; max 2 people per site.