Geophysical Research Abstracts
Vol. 15, EGU2013-5593, 2013
EGU General Assembly 2013

Ecosystem-scale fluxes in seminatural Pyrenean grasslands: role of annual dynamics of plant functional types

Nuria Altimir (1), Mercedes Ibañez (1), Jan Elbers (1,5), Cristina Rota (1), Claudia Arias (2), Arnaud Carrara (3), Salvador Nogues (2), Maria-Teresa Sebastia (1,4)

(1) Laboratory of Functional Ecology and Climate Change, Forest Sciences Center of Catalonia, , Solsona, Spain (nuria.altimir@ctfc.cat), (2) Plant Physiology Unit, Faculty of Biology, Barcelona University, Barcelona, Spain, (3) Centro de Estudios Ambientales del Mediterraneo, Valencia, Spain, (4) School of Agricultural Engineering, University of Lleida, Lleida, Spain, (5) Alterra, Wageningen University and Research, The Netherlands

The net ecosystem exchange (NEE) and the annual C balance of a site are in general modulated by light, temperature and availability of water and other resources to the plants. In grasslands, NEE is expected to depend strongly on the vegetation with a relationship that can be summarized by the above-ground biomass, its amount and dynamics. Any factor controlling the amount of green biomass is expected to have a strong impact on the short-term NEE, such as amount of solar radiation, water availability and grazing pressure. These controls are modulated differently depending on the plant functional type enduring them. Furthermore, as different guilds follow different functional strategies for optimization of the resources, they also present different patterns of change in their capacities such as photosynthetic fixation, belowground C allocation, and C loss via respiration.
We examined these relationships at several semi-natural pastures to determine how the seasonal distribution of plant functional types is detected in the short-term ecosystem exchange and what role it plays. We have looked into these patterns to determine the general variation of key processes and whether different temporal patterns arise between different guilds. The study sites are in the Pyrenees, on the mountain pastures of La Bertolina, Alinyà, and Castellar at 1300, 1700, 1900 m a.s.l. respectively. We performed ecosystem-scale flux measurements by means of micrometeorologial stations combined with a thorough description of the vegetation including below- and above-ground biomass and leaf area as well as monitoring of natural abundance of C isotopes, discriminated by plant functional types. We present here the results of the study.