



Seasonal evolution of carbon allocation to biomass in a French beech forest.

Laura Heid (1), Christophe Calvaruso (2), Sébastien Conil (3), Marie-Pierre Turpault (2), and Bernard Longdoz (1)

(1) INRA, UMR 1137-EEF, Champenoux, France (laura.heid@nancy.inra.fr), (2) INRA, UR 1138-BEF, Champenoux, France, (3) ANDRA, DRD-OS/GES, Bure, France

The objective of this study is to get a better understanding of ecosystem behavior in term of assimilated carbon (C) use. In the global climate change context, this C allocation could play a critical role in predicting ecosystems long terms emissions (Trumbore 2006) and has become a major goal of several emergent studies

The monthly C allocation has been determined for a 50-year old beech forest located in north-east of France through the quantification of Gross Primary Production (GPP), biomass production and some of its components (holocelluloses, lignin). In a second phase, the potential factors influencing those productions and allocations throughout a year have been assessed.

The temporal evolution of GPP was obtained from the partitioning of eddy-covariance flux measurements and monitored for one year. It was connected to tree aboveground C biomass growth at a monthly step. To achieve the latter, site specific allometric equations were used with trees diameter at breast height (DBH) measured monthly during the growing season on one hand and, on the other hand, C concentrations were deduced from analyses on trunk cores (sampled monthly) and on leaves and bulk branches cores (sampled at the beginning and at the end of the growing season). The C allocated to the aboveground biomass was then estimated, along with the portion allocated to structural C. The results show the delay existing between the end of the tree growth and carbon assimilation. We analyze the possibility to explain this divergence by a compensation coming from the C concentration evolution.

Keywords: Carbon allocation, Forest, Biomass production, Carbon concentration, Eddy Covariance

Trumbore S. 2006. Carbon Respired by Terrestrial Ecosystems – Recent Progress and Challenges. *Global Change Biology* 12 (2): 141–53.