Relationships between GPP, NPP, NEP, Ra and Rh in forest ecosystems

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Abstract

The forests of the terrestrial biosphere play an important role in the global carbon 'sink' sequestering large amounts of atmospheric carbon every year. Considerable uncertainty regarding the fate of this sequestered carbon and the status of our terrestrial sinks over both short and long timescales still exist and resolving some of these issues are critical in the event of a changing climate and human disturbance. How carbon flows between the different components of our forest ecosystems and it's eventual allocation to long term storage pools, such as terrestrial biomass and soils are likely to vary across forests of different growth strategy (deciduous vs. evergreen), age and management regime as well as reflecting the climatic niche they occupy. The revised work plan of the Forest Activity Group in the Ecosystem Component have assembled a database that will facilitate the comparison of GPP, NEP, NPP, R_a and R_h across all the forest ecosystems that form the long-term CarboEurope-IP flux network and have further extended beyond Europe, assimilating data from other flux sites collectively encompassed by the FLUXNET network. On June 15th and 16th 2006, the Forest Activity Group assembled a workshop to analyse this global GPP, NPP and NEP dataset and describe patterns in the component carbon fluxes across forest types, climatic zones and management regimes. Further aims of the workshop were to: (1) compile and compare complete carbon-budgets for forest ecosystems, with the goal of identifying and understanding the apparent allocation priorities for carbon within different forest types and

how these sinks will endure, (2) compare model simulations of GPP, NPP and NEP for different forest types across the globe and compare critically with the observations assembled in the global database and (3) estimate the global GPP and NPP based on three independent approaches that are constrained by field observations. Conclusions from our workshop will be summarised and reported to the global carbon cycle research community during this presentation.