

Title:

TRENDS AND CONTROLS OF INTER-ANNUAL VARIABILITY IN THE CARBON BUDGET OF TERRESTRIAL ECOSYSTEMS

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Abstract Text:

The climate sensitivity of the terrestrial carbon budget will substantially affect the sign and strength of the land-climate feedbacks and the future climate trajectories. Current trends in the inter-annual variability of terrestrial carbon fluxes (IAV) may contribute to clarify the relative role of physical and biological controls of ecosystem responses to climate change. For this purpose we investigated how recent climate variability has impacted the carbon fluxes at long-term FLUXNET sites. Using a novel method, the IAV has been factored out in climate induced variability (physical control), variability due to changes in ecosystem functioning (biological control) and the interaction of the two terms. The relative control of the main climatic drivers (temperature, water availability) on the physical and biological sources of IAV has been investigated using both site level fluxes and global gridded products generated from the up-scaling of flux data. Results of this analysis highlight the fundamental role of precipitation trends on the pattern of IAV in the last 30 years. Our findings on the spatial/temporal trends of IAV have been finally confirmed using the signal derived from the global network of atmospheric CO₂ concentrations measurements.

Session Selection: Biosphere-Atmosphere Greenhouse Gas Fluxes in Terrestrial Ecosystem