



Unexpected extreme events drive the inter-annual variability in carbon exchange at the Pine forest in Netherlands.

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The carbon exchange between vegetation and the atmosphere tends to vary on an annual basis. This change is a continuous process its trend emerging over a period of years can be analysed. In any such trend over a prolonged period, some years stand out more than the others on account of extreme events. Explaining deviations from the expected average emissions may help to understand the drivers behind these interannual deviations. Such noticeable deviations in trend maybe on account of extreme events and need to be analysed in overall context of the ecosystem. This research's focus is to identify the main drivers responsible for the deviations, and how extreme events impact the variability over a prolonged period of time. The hypothesis being that extreme events are driving these deviations. Carbon flux data done for multiple years (1997-2015) for a site at the Loobos Pine Forest is used and compared with an ecosystem model, LPJ-GUESS (Lund-Potsdam-Jena General Ecosystem Simulator) to understand if the deviation of measured data from the simulated data is on account of extreme events on a monthly and daily basis. A Principal Component Analysis is performed on the identified deviations between measured and simulated carbon exchange to pin point the main cause behind their occurrence.