



The effect of drought in 2015 on carbon fluxes in two Norway spruce forest ecosystems with contrasting elevation and age

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The frequent occurrences of drought pose serious threats to forest ecosystems and offset carbon sinks. The main aim of this study was to investigate the impact of drought on the daily net ecosystem exchange (NEE) and gross primary production (GPP) within the growing season of 2015 and compare to the same period for two adjacent years (2014 and 2016) with no significant drought conditions. The study was performed over a dry Norway spruce forest (highland) in Rajec and a wet Norway spruce forest (mountain) in Bily Kriz, located within the Czech Republic, by using the eddy covariance technique. Reduced precipitation amount recorded mostly in Central Europe during the summer of 2015 caused water deficit that led to a drought condition and decrease in soil moisture. Results from both sites showed a decrease in the forest carbon uptake during heat and water stress. During the summer drought period, the measured GPP within the dry spruce forest decreased by 21 % as compared to the measured GPP in the wet spruce forest. The total GPP during the 2015 summer drought period (May - September) for the dry spruce forest was 975.6 gC m⁻² per the growing season as compared to 1232.5 gC m⁻² per the growing season for the wet spruce forest site. The presented results show the vulnerability of carbon uptake of the Norway spruce forest to drought effects at low altitudes with less water supply.

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