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# Modelling grassland phenology and growth using near-surface remote sensing derived time series

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Both the size and the duration of rain events have a significant influence on the phenology and growth of grasslands. This pulse-response nature of grasslands makes quantifying intra and inter-annual variability in grassland growth challenging and large uncertainties remain on which precipitation characteristics have the greatest influence on grassland phenology, growth and ecosystem productivity.

Here we present modeled results of soil water content and grassland growth on a daily timestep from 16 grassland sites (40 site years) across arid, temperate and tropical biomes. We build upon a simple threshold-delay concept with provisions for influences of soil temperature and photoperiod on plant growth. Modelled soil water content and grassland growth are based upon limited set of widely available climatic drivers such as daily precipitation, minimum and maximum temperature, to facilitate scaling, and validated against near-surface remote sensing (PhenoCam) data of vegetation greenness. This simple model framework allows us to explore future effects of changes in the size and duration of precipitation events as well as temperature on grassland phenology and growth across different biome types.