Supplemental materials for spatial and temporal shifts in photoperiod with climate change

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June 4, 2019

Supplemental Methods

Greenup differences (Figure 2)

Satellite images are combined with algorithms—e.g. MODIS Land Cover Dynamics— to identify the dates on which phenophases transition from one to the next. Using data from the MODIS sensor (available at: http... DAN, could you please provide the website from where the maps were extracted), we extracted spatial data for North American and Western European green-up—the beginning of seasonal greening—for the years 2009 and 2012. Green-up dates are calculated on the basis of the onset of the Enhanced Vegetation Index (**?**). From green-up maps for each year we derived the photoperiod corresponding to each pixel (according to its geographic coordinates and day of the year), using R function XXX in package XXX (please Dan, fill these gaps) (see Fig. 2a,b in main text). Finally, we mapped spatial patterns of temporal shifts in green-up comparing an early and late spring years. To do so, we simply substracted the 2013 green-up map to the 2009 one. The spatial resolution corresponding to the maps is of 0.1 x 0.1 degrees.