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Modelling the influence of future climates on bud burst phenology

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This study examines wether the assumed climate warming is represented by phenological models in a correspondingly earlier bud burst (BB). Some studies suppose that the predicted climate warming leads to continuously linear shifts towards earlier phenological stages, but some studies also indicated shifts to later phenological stages. We applied the promoter-inhibitor-model (PIM) on several future climate scenarios. PIM considers the complicatied mechanistic interactions between temperature, photo-period and chilling requirements. We found a trend towards earlier BB for the period 2002-2100, with magnitudes between -0.05 and -0.11 days per year, varying between species. A declining tendency of these trends over the considered period suggests a limited future BB advancement due to unfulfilled chilling requirements and photo-period limitations. Model training on an extensive phenological database together with climate scenarios provides new perceptions on the process understanding of switches between phenological phases.