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Global variability of simulated and observed vegetation growing season onset and offset

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Vegetation phenology and its variability have substantial influence on land-atmosphere interaction, and changes in growing season length are additional indicators of climate change impacts on ecosystems. For these reasons, global land surface models are routinely evaluated in order to assess their ability to reproduce the observed phenological variability. This work presents a new approach that integrates a wider spectrum of growing season modes in order to better describe the observed variability in vegetation growing season onset and offset, as well as assess the ability of state-of-the-art land surface models to capture this variability at the global scale. The land surface models results are validated against the LAI3g satellite-observation. The comparison between data and model outputs shows the ability of models in reproducing the growing season features in the boreal forests, but also displays their limitations located, for example, in areas where water availability acts as the main driver of vegetation phenological activity. In general, the new methodology expands the area of analysis from northern mid- and high-latitudes to the global continental areas, and allows to assess the vegetation response to the on-going climate change in a larger variety of ecosystems, ranging from rain forests to semi-arid regions, passing through boreal evergreen and temperate deciduous forests. This effort is part of the EU-funded CRESCENDO project.
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