

The calibration of a growing season index using digital photography

M. Možný (1), M. Virág (2), D. Bares (1), M. Trnka (3), Z. Zalud (3), L. Bartosová (3), and J. Novák (1)

(1) Czech Hydrometeorological Institute, Doksany Observatory, Doksany, Czech Republic (martin.mozny@chmi.cz), (2) AS&Consulting, Javorová 3774, 27601 Mělník, Czech Republic, (3) Mendel University in Brno, Zemědělská 1, 61300 Brno, Czech Republic

We analyze the results of several years of vegetation canopy monitoring using digital cameras in the International Phenological Garden (IPG) Doksany. The different color channels (red, green and blue) in each image were quantitatively analyzed in order to track seasonal changes in the canopy conditions. We quantified the timing and rate of change of canopy development by using a simple vegetation index. This index was compared to phenological observations, in addition to the NDVI index that was derived from direct on-site measurements and satellite images. The results were used to calibrate the growing season index (GSI), which was calculated using conventional meteorological measurements. Finally, we used the GSI index to produce global maps that distinguish regional differences in the current phenological development in the Czech Republic. The GSI index can be used to model future phenological responses to changing climatic conditions, as well as model CO₂ exchange at the biosphere-atmosphere interface.

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