How valuable are citizen science data for a space-borne crop growth monitoring? – The reliability of self-appraisals

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Motivation

Aim: Physically based satellite-aided retrieval of biophysical state variables with Earth Observation Land Data Assimilation System (EO-LDAS)

Problem: Superposition of different parameter influences on the spectrum → Lack of knowledge

Solution: Including prior information → Integrating information from other sources: (1) measurement stations/networks (2) citizen science (CS) data

Figure 1: Satellite-aided retrieval of biophysical crop parameters (Lewis et al. 2012; Combai et al. 2002; Erting 2002)

Trustability Assessment

Trustability assessment based on data collected on DEMMIN test site (Northeast Germany) in 2018 and 2019.

Level of difficulty Examples to profiling questions Mean values of correct answers given before (Pre) and after (Post) field campaigns Profiling results vs. self assessment during field campaigns

Easy

Where do you see wheat depicted?

Pre: 6.2 → 6.3

Post: 6.3 → 6.4

Medium

Where do you see rape depicted?

Pre: 5.3 → 5.4

Post: 5.4 → 5.5

Heavy

Where do you see barley depicted?

Pre: 6.2 → 6.3

Post: 6.3 → 6.4

Ability to identify crop types

Figure 2: Set-up of prior information by (a) merging available citizen science data (CS-data) and (b) incorporating it in a phenological development model. The resulting prior information is (c) assimilated in the Earth Observation Land Data Assimilation Scheme (EO-LDAS) scheme after Lewis et al. (2012).