Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2020-358-RC2, 2020

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Anatomy of the 2018 agricultural drought in The Netherlands using in situ soil moisture and satellite vegetation indices" *by* Joost Buitink et al.

Anonymous Referee #2

Received and published: 6 October 2020

This is a nice work that show the relation found between study in situ soil moisture profile (SMC) measurements of the Raam and Twenthe networks in the Netherlands, with two satellite derived (RS) vegetation indices (VIs), NIRv and VOD, during the 2018 summer.

I believe that this manuscript has the quality standards of the journal and presents a very interesting work combining field measures with remote sensing measures. This is an important point. However, I have a few comments to the authors so the reader will find it easier to understand:

1) In the abstract you used a lot of acronyms and that is ok. But when you say "and

Printer-friendly version

Discussion paper

its effect on GPP in models" I suggest to put first what is that GPP. You use NIRv and VOD but you say that they are vegetation indexes and that is fine, but what is GPP?

2) Deeper are the measures in soil are this really reflected by the VIs? or this is just a consequence of the correlation among depths of SMC. For me, it is hard to see that a measure at 80 cm depth can be reflected in RS bands. But the measures between 80 cm and 10 cm can be correlated. Can you show this correlations among depths?

3) Are precipitation anomaly and SIF anomaly calculated in the same way that NIRv anomaly?

4) You really have three years. Calculating these anomalies means that you have the average of two years and then compare it with 2018. Is it right? Perhaps you should describe 2016 and 2017 as quite normal years, otherwise it looks too few years to consider the estimation a week anomaly.

5) Figure 2. This figure is very important to understand this nice work. You should improve it as you talk about black lines (almost I cannot see it), dashed lines, etc. Please, make it more clear. I imaging that this is the average of an area. Isn't it? If I understood it right just indicate it in the label of this figure. You mention in this label Figure 3. I think that you shouldn't. Another point is that if you improve Figure 2 then the data use from Figure 2 in Figure 3 will be easier to understand.

6) Figure 3. You mention in the label "vegetation productivity". What I can see is the relation between VIs anomalies with SWC. Between VIs and vegetation productivity which is the relation? This relation is using a time lag of 0. Did you try the relation with some time lag of 1 or 2? You mention in the introduction the lag that exist between meteorological anomalies and VIs anomalies. Exist any lag between SWC and VIs?

7) In table 1 you show the normalized critical soil moisture content in brackets. I believe that will be more interesting to see the s.e. of this estimation.

8) In the abstract you said the nonlinear relation between negative soil moisture anoma-

lies and VIs reflects that the drought was develop weeks before the first reduction in vegetation indices. Perhaps you should explore how many weeks before.

Finally, this "anatomy of" expression in the title I will change it for other or just suppressed it.

I really enjoyed your work.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2020-358, 2020.