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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Flash drought onset over the Contiguous United States: Sensitivity of inventories and trends to quantitative definitions" *by* Mahmoud Osman et al.

Anonymous Referee #2

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Major concerns:

>Though there are a bunch of flash drought definition, it is generally accepted by the scientific community that flash drought should emphasize the intensification rate to distinguish other types of drought [1]. I think the HWD definition is not suitable for flash drought, considering two aspects: 1) this definition cannot descript the rapid intensification of flash drought; 2) this definition may not be able to distinguish between flash droughts and short-term compound dry-hot events, leading to miscalculate flash droughts. Assuming that during dry-hot summer, conditions of HWD definition are relatively easy to meet, but actually such conditions may not form flash drought. Please

clarify how to distinguish between flash droughts and short-term compound dry-hot events in this paper.

Reference: [1] Otkin, J. A., Svoboda, M., Hunt, E. D., Ford, T. W., Anderson, M. C., Hain, C., Basara, J. B., Otkin, J. A., Svoboda, M., Hunt, E. D., Ford, T. W., Anderson, M. C., Hain, C. and Basara, J. B.: Flash Droughts: A Review and Assessment of the Challenges Imposed by Rapid-Onset Droughts in the United States, Bull. Am. Meteorol. Soc., 99(5), 911–919

>The presentation of typical flash drought events is weak and needs more specific cases. The authors may wish to show the temporal variation of real-world flash droughts in a Bukovsky Region, and further compare the differences of flash drought monitoring ability between definitions;.

>The climate variation during typical events should also be shown to help understand climate drivers, if climate data are availabe. In addition, in order to reflect whether these events have real impacts, it is better to analyze the changes of vegetation indicators (such as NDVI) , rather than just present description. Regarding these, I'm not very convinced that SMVI definition can well capture flash drought onset in both humid and arid regions.

>The authors shows the climate variation for typical regions during 2011 and 2017 flash droughts. I think it cannot well descript climate driver for the occurrence of flash drought, because such long-term climate anomalies could also lead to traditional droughts. I suggest that authors only focus on climate anomalies during flash drought events, such as extreme atmospheric anomalies (like rainfall defict, high surface temperatures, strong winds, or clear skies).

Other comments >Line 48: Please illustrate here that each color represents the flash drought definition. >Line 80: When the RZSM contains several layers, which layer of soil water should be selected? >Line 256: Please re-draw the Fig. 4. The legend can be a clear color segment. >Line 318: Figure 6 shows the frequency of flash drought

during typical years or the values of the indices? Please make it clear.

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