

Interactive comment on “The effect of climate on timescales of drought propagation in an ensemble of global hydrological models” by Anouk I. Gevaert et al.

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This is a very interesting study on the timescale of drought propagation and is pertinent to my research interest. Here I have two minor points:

1) In the last paragraph of section 4.3, the authors state that “Unfortunately, evaluation of soil moisture drought propagation timescales is inhibited by the lack of root-zone soil moisture data at global scale. While satellite soil moisture products are available, these are limited to the upper few centimeters of the soil (Owe et al., 2008), which is not representative of root-zone soil moisture.” However, satellite observations of total water storage (TWS) from the Gravity Recovery and Climate Change (GRACE) include soil

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moisture variations in the root-zone. It also has been used to investigate drought propagation timescale in combination with SPEI and other satellite records at the global scale (Zhao et al. 2017 <https://doi.org/10.1175/JHM-D-16-0182.1>). Therefore, the authors should phrase their statement more carefully here.

2) Does the magnitude and duration of a specific meteorological drought affect the timescale of drought propagation in the terrestrial hydrologic cycle? For example, in a region a meteorological drought might happen very quickly and intense (such as flash drought), it might quickly deplete soil moisture and streamflow therefore may better agree with short time-scale SPI. But in the same region, a meteorological drought can form slowly and gradually propagate into the terrestrial hydrological cycle therefore may better agree with long time-scale SPI. Can the authors explain how this would affect the interpolation of a "temporally averaged" SPI-n presented in the paper?

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