Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2019-292-RC2, 2019

Hydrology and Earth System Sciences
Discussions

Interactive comment on "Global partitioning of runoff generation mechanisms using remote sensing data" *by* Joseph T. D. Lucey et al.

Anonymous Referee #2

Received and published: 5 November 2019

This manuscript assessed a linear regression model for predicting surface inundation (SWAMPS) using two predictors, gridded precipitation product (GPCP) and GRACE TWS anomalies (TWSA). While the problem may be interesting, the hypothesis and approach taken were too naive or even erroneous. - TWS is highly correlated to precipitation (with potential lag adjustments) in most areas (see Humphrey et al., 2016, Figure 8a). From linear regression theory, any time you have collinearity, the results may look weird. - The authors' hypothesis is that surface water inundation is linearly correlated to precipitation amount. This may not be true from topography perspective. As a case in example, heavy storm in mountainous areas will result in different inundation extent than that in plain areas. - SWAMPS is daily data and surface inundation is often more meaningful at daily or even subdaily scales. At the monthly scale, SWAMPS

basically shows surface water bodies that can be well delineated from Landsat data. Why do we need your model in the first place? - I looked at the GPCP description, which says "The Version 2.3 monthly product covers the period January 1979 to the present, with a delay of two to three months for data reception and processing." Similarly, GRACE monthly data product has several months of data processing latency. So the significance of this linear regression approach (requiring GRACE and GPCP) for flood inundation is limited. - The scale 0.25deg is too coarse for water managers who are interested in inundation.

Reference: Humphrey, V., Gudmundsson, L., & Seneviratne, S. I. (2016). Assessing global water storage variability from GRACE: Trends, seasonal cycle, subseasonal anomalies and extremes. Surveys in Geophysics, 37(2), 357-395.

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