Enhancing the USDA FAS Global Crop Assessment Decision Support System Using SMAP Soil Moisture Data

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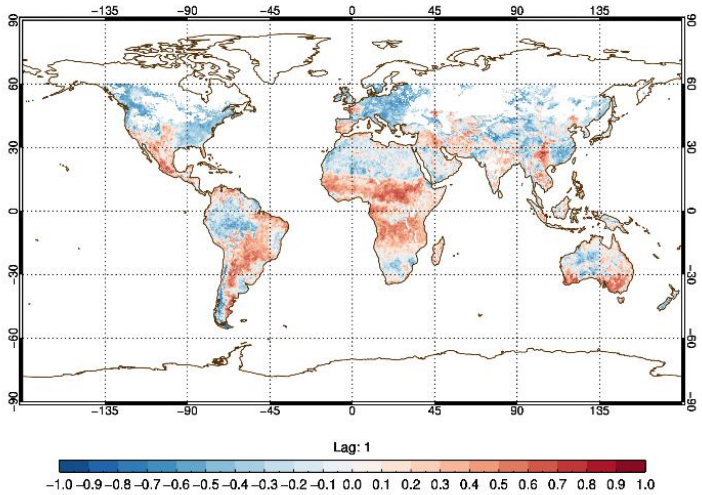
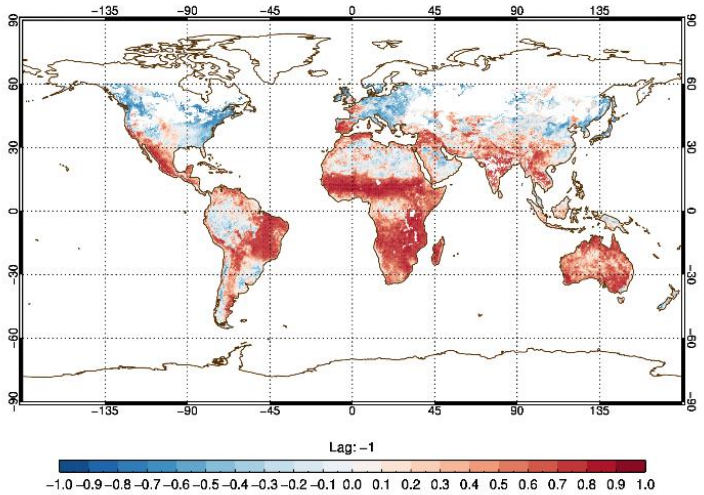
Plotted variable = Correlation between *current* monthly soil moisture levels and *future* (+ 1 month) vegetation health (NDVI).

Model-only



Correlation of *current* USDA FAS soil moisture product based on water balance modeling

Model + SMAP



Enhanced correlation observed *after* the assimilation of SMAP L3 retrievals.

Higher correlation = improved early detection of agricultural drought

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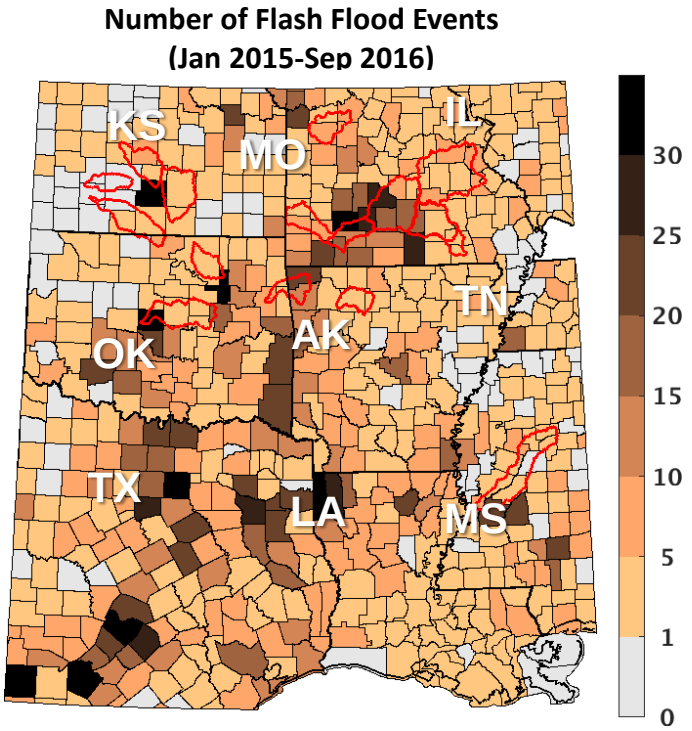
Potential SMAP Contributions to Stream Flow Forecasting

Wade Crow (USDA ARS), Fan Chen (USDA ARS/SSAI), Rolf Reichle (NASA GSFC) and Qing Liu (NASA GSFC/SSAI)

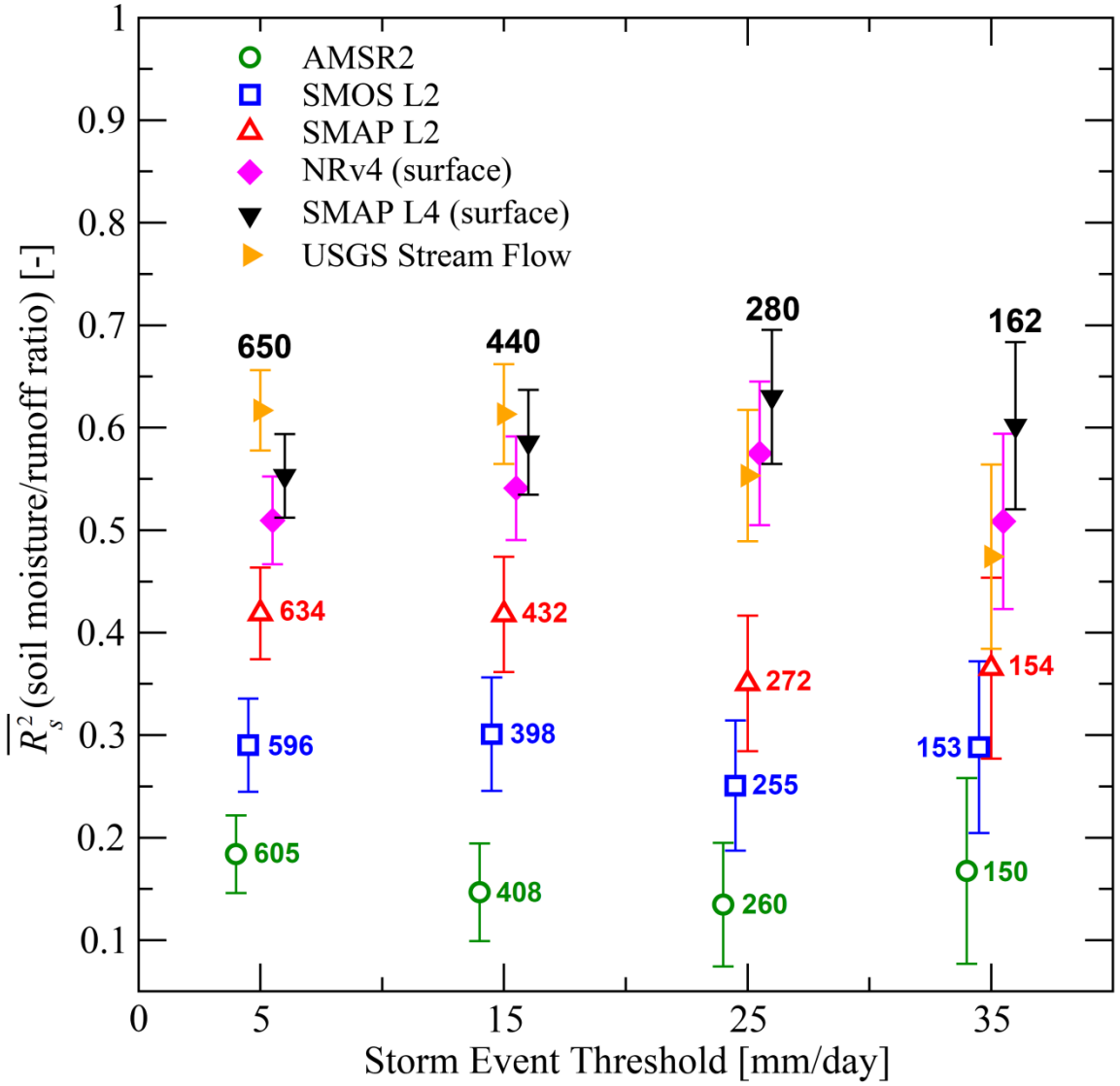


"In just under 18 months [March 2015 to August 2016] , however, the number, extremity and widespread nature of flood events has been incredible in this region [Texas northeast to Missouri]."

Flash flood potential = (rainfall) x (fraction of rain converted to runoff)

"Runoff ratio" varies (in part) due to pre-storm soil moisture levels…

Can SMAP helps us improve the pre-storm prediction of runoff-ratio?



Crow, W.T., Chen, F., Reichle, R.H., and Liu, Q. L band microwave remote sensing and land data assimilation improve the representation of prestorm soil moisture conditions for hydrologic forecasting. *Geophysical Research Letters.* 44. 10.1002/2017GL073642. 2017.