Reading

Validation of TAMSAT-derived soil moisture using NDVI

Atmospheric Science Conference – June 2019





Importance of water

LandSat 8 imagery – NASA's Earth Observer



FEWS NET classification is IPC-compatible. IPC-compatible analysis follows key IPC protocols but does not necessarily reflect the consensus of national food security partners.

It's complicated...

Soil moisture

Marine .

://www.farmmanagement.pro/5-methods-of-manipulating-soil-moisture-levels/

TAMSAT



Period: Year 2019, Months 03 to 05 Theme: Rainfall Anomaly Estimate (against 1983-2012 climatology) Source: TAMSAT, derived from Meteosat TIR



Incorporating JULES



Figure taken from Brown et al. 2017. Weather, 72(7) - Contains public sector information licensed under the Open Government Licence v.1.0

Validation

- 1) Is soil moisture a good predictor of vegetation growth?
- 2) Does soil moisture have added value over rainfall?

Rainfall

- TAMSAT
- **Cold cloud duration**

100 x (NDVI – min) / (max – min)

VCI

Yield

- NASA GIMMS project
- **AVHRR**



Incorporating JULES

Soil moisture

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- End of season questionnaires
- Additional sources

Predicting VCI

- SPI (standardised rainfall) vs. VCI
- October to December
- R = 0.86



Predicting VCI

- Soil moisture vs. VCI
- October to December
- R = 0.88



Predicting crop yield

- SPI (standardised rainfall) vs. FAO maize yield
- March to October
- R = 0.45



Predicting crop yield

- Soil moisture vs. FAO maize yield
- March to October
- R = 0.54



Next steps

- Crop parameters to improve yield predictions
- County-level assessment
- Forecasting ability
- OND 2019 pilot



TAMSAT soil moisture provides a more direct means of monitoring agricultural drought



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