Geophysical Research Abstracts
Vol. 18, EGU2016-1285, 2016
EGU General Assembly 2016

Combining off-line and near-real-time satellite observations of soil moisture to support global drought monitoring

Markus Enenkel (1,2), Wouter Dorigo (1), and Christoph Reimer (1)

(1) Vienna University of Technology, Department of Geodesy and Geoinformation, Vienna, Austria (markus.enenkel@geo.tuwien.ac.at), (2) Columbia University, International Research Institute for Climate and Society

Soil moisture is a crucial variable that links atmospheric anomalies and land surface conditions. Since land surface models cannot provide soil moisture in near real-time (NRT), satellite observations are an essential source of information for monitoring. The soil moisture dataset that is generated within the Climate Change Initiative (CCI) of the European Space Agency (ESA) (ESA CCI SM) is a popular research product. It is composed of observations from nine different satellites and aims to exploit the individual strengths of active (radar) and passive (radiometer) sensors, thereby providing surface soil moisture estimates at a spatial resolution of 0.25 degrees. However, the ESA CCI SM product is a reanalysis dataset of which the annual updating cycle limits its use for operational drought monitoring. Therefore, this study proposes an adaptation of the ESA CCI processing chain for daily global updates via satellite- derived NRT soil moisture observations. In order to extend the ESA CCI SM dataset from 1978 to present we use NRT observations from the Advanced SCATterometer on-board the MetOp satellites and the Advanced Microwave Scanning Radiometer 2 on-board GCOM-W. Since these NRT observations do not incorporate the latest algorithmic updates, parameter databases, and intercalibration efforts, by nature they offer a lower quality than reprocessed offline datasets. Our findings indicate that, despite issues in arid regions, the new "CCI NRT" dataset shows a good correspondence with the offline ESA CCI SM. The average global correlation coefficient between CCI NRT and ESA CCI SM (Pearson's R) is 0.8. An initial validation with 40 in-situ observations in France, Kenya, Senegal and Kenya yields an average R of 0.58 and 0.49 for ESA CCI SM and CCI NRT respectively. In summary, the CCI NRT dataset is getting ready for operational use, supporting applications such as drought monitoring, weather forecasting or agricultural applications.