EGU21-10312
https://doi.org/10.5194/egusphere-egu21-10312
EGU General Assembly 2021

A roadmap for high-resolution satellite soil moisture applications

Jian Peng[1,16], Clement Albergel[2], Anna Balenzano[3], Luca Brocca[4], Olive Cartus[5], Michael H. Cosh[6], Wade T. Crow[6], Katarzyna Dabrowska-Zielinska[7], Simon Dadson[8], Malcolm W.J. Davidson[9], Patricia de Rosnay[10], Wouter Dorigo[11], Alexander Gruber[12], Stefan Hagemann[13], Martin Hirschi[14], Yann H. Kerr[15], Francesco Lovergine[3], Miguel D. Mahecha[16], Philip Marzahn[17], Francesco Mattia[3], and the rest of the team[*]

[1]Helmholtz Centre for Environmental Research - UFZ, Remote Sensing Department , Leipzig, Germany
[2]European Space Agency Climate Office, ECSAT, Harwell Campus, Oxfordshire, Didcot OX11 0FD, UK
[3]Consiglio Nazionale delle Ricerche (CNR) - Istituto per il Rilevamento Elettromagnetico dell'Ambiente, Bari, Italy
[4]Research Institute for Geo-Hydrological Protection, National Research Council, Perugia, Italy
[5]Gamma Remote Sensing Research and Consulting AG (GAMMA), Gümligen, Switzerland
[6]USDA-ARS Hydrology and Remote Sensing Laboratory, Beltsville, MD, USA
[7]Institute of Geodesy and Cartography (IGiK), Remote Sensing Centre, Warsaw, Poland
[8]School of Geography and the Environment, University of Oxford, OX1 3QY Oxford, UK
[9]European Space Agency, Mission Science Division, 2200 AG Noordwijk, the Netherlands
[10]European Centre for Medium-Range Weather Forecasts (ECMWF), Reading RG2 9AX, UK
[11]Department of Geodesy and Geo-Information, TU Wien, Vienna, Austria
[12]Department of Earth and Environmental Sciences, KU Leuven, Heverlee, Belgium
[13]Institute of Coastal Research, Helmholtz-Zentrum Geesthacht, Geesthacht, Germany
[14]Institute for Atmospheric and Climate Science, ETH Zürich, Universitätsstrasse 16, 8092 Zürich, Switzerland
[15]CESBIO (UMR 5126 Université Toulouse 3, CNES, CNRS, INRAE, IRD), Toulouse, France
[16]Remote Sensing Centre for Earth System Research, Leipzig University, 04103, Leipzig, Germany
[17]Department of Geography, University of Munich (LMU), 80333 Munich, Germany
[*]A full list of authors appears at the end of the abstract

This contribution presents the main findings of a recently published review on high-resolution satellite soil moisture applications (https://doi.org/10.1016/j.rse.2020.112162). The scientific community has made significant progress in estimating soil moisture from satellite-based Earth observation data, particularly in operationalizing coarse-resolution (25-50 km) soil moisture products. This presentation summarizes existing applications of satellite-derived soil moisture products and identifies gaps between the characteristics of currently available soil moisture products and the application requirements from various disciplines. This presentation also discusses the efforts devoted to the generation of high-resolution soil moisture products from satellite Synthetic Aperture Radar (SAR) data such as Sentinel-1 C-band backscatter observations and through downscaling of existing coarse-resolution microwave soil moisture products. Open issues and future opportunities of soil moisture remote sensing are discussed, providing guidance for the further development of operational soil moisture products and for bridging the gap between the soil moisture user and supplier communities.

The published review is:

Peng, J., Albergel, C., Balenzano, A., Brocca, L., Cartus, O., Cosh, M.H., Crow, W.T., Dabrowska-Zielinska, K., Dadson, S., Davidson, M.W.J., de Rosnay, P., Dorigo, W., Gruber, A., Hagemann, S., Hirschi, M., Kerr, Y.H., Lovergine, F., Mahecha, M.D., Marzahn, P., Mattia, F., Musial, J.P., Preuschmann, S., Reichle, R.H., Satalino, G., Silgram, M., van Bodegom, P.M., Verhoest, N.E.C., Wagner, W., Walker, J.P., Wegmüller, U., & Loew, A. (2021). A roadmap for high-resolution satellite soil moisture applications – confronting product characteristics with user requirements. *Remote Sensing of Environment*, 252, 112162

rest of the team: Jan Pawel Musial (7), Swantje Preuschmann (18), Rolf H. Reichle (19), Giuseppe Satalino (3), Martyn Silgram (20, Deceased), Peter M. van Bodegom (Institute of Environmental Sciences, Leiden University, 2333 CC Leiden, the Netherlands), Niko E.C.Verhoest (Laboratory of Hydrology and Water Management, Ghent University, Coupure links 653, Ghent 9000, Belgium), Wolfgang Wagner (11), Jeffrey P.Walker (Department of Civil Engineering, Monash University, Clayton, Victoria, Australia), Urs Wegmüller (5), Alexander Loew (17, Deceased)