Geophysical Research Abstracts
Vol. 20, EGU2018-5722, 2018
EGU General Assembly 2018

Delevelopment of downscaling algorithm using Landsat data for SMAP

Taehwa Lee, Sangwoo Kim, and Yongchul Shin
Kyungpook National University, Daegu, Republic Of Korea (ycshin@knu.ac.kr)

Satellite-based techniques have advantages in providing remotely sensed (RS) soil moisture footprints at the spatio-temporal scales across the world, but their coarse resolutions still limit the applicability of RS soil moisture data to field regions. In this study, we developed the Landsat-based Downscaling Algorithm (LDA) to scale down soil moisture footprints from the coarse- to finer-scales. The LDA scheme estimates the Landsat-based soil moisture (30m [U+F0B4] 30m) values in a spatial domain, and the weighting values based on the Landsat-based soil moisture were derived at the finer-scale. Then, the coarse-scale soil moisture footprints can be downscled based on the derived weighting values. The Little Washita (LW21) site in Oklahoma (USA) was selected to validate the LDA scheme with the in-situ soil moisture data measured at the multiple sampling points that can reprent the airborne sensing (Electronically Scanned Thinned Array Radiometer-ESTAR, 800m [U+F0B4] 800m) scale. The sub-pixels of soil moisture downscaled from ESTAR were identified well with the measurements, although uncertainties exist in the downscaled results. Furthermore, the Soil Moisture Active & Passive (SMAP, 9km [U+F0B4] 9km) based soil moisture products were downscaled by the LDA. Although the validation works were not conducted at the SMAP scale, the downsclaed soil moisture values can represent the land surface condition. Thus, the LDA scheme can contribute to the improvement of RS soil moisture footprints at field regions.

Acknowledgement
This work was supported by the National Research Foundation of Korea (NRF) grant funded by the Korea government (Ministry of Education, MOE) (No: NRF-2016R1D1A3B03932106).