A Blended Satellite Soil Moisture Data Product from NESDIS-SMOPS for Assimilation in Numerical Weather Prediction Models

Xiwu Zhan [a], Jicheng Liu [a,b], Chris Hain [a,c], Li Fang [a,c], and Jifu Yin [a,c]

[a] *NOAA-NESDIS Center for Satellite Applications and Research, USA, Xiwu.Zhan@noaa.gov;* [b] *Dept of Geography, George Mason University, USA,* [c] *ESSIC-CICS, University of Maryland, USA*

Soil moisture has long been recognized as one of the critical land surface initial conditions for numerical weather, climate, and hydrological predictions and agricultural and societal water resources management. Satellite soil moisture data products have been generated since more than a decade ago. However, none of these satellite soil moisture data products has been used operationally in the prediction models and management practice because of their accuracy or reliability issues. A climatologically consistent and qualitatively reliable global soil moisture product, is thus in urgent need for these applications. A group of scientists from NOAA-NESDIS and China Meteorological Administration (CMA) are collaborating in generating soil moisture data products from various optical and microwave remote sensing satellites. This presentation will focus on the algorithm development and validation of the soil moisture Environmental Data Record (EDR) from AMSR2 after a general introduction of the soil moisture operational production system (SMOPS) developed at NOAA-NESDIS and the atmosphere-land exchange inversion model (ALEXI) implemented with USDA-ARS collaborators. Examples of applications of these data products in numerical weather prediction and agricultural drought monitoring will be discussed. A multi-sensor soil moisture data merging system developed at CMA-NMIC will also be presented.