

The Utility of the Real-Time NASA Land Information System Data for Drought Monitoring Applications

Kristopher D. White

National Weather Service/NASA Short-term Prediction Research and Transition (SPoRT) Center
Huntsville, AL

Jonathan L. Case

ENSCO, Inc./NASA SPoRT Center
Huntsville, AL

Measurements of soil moisture are a crucial component for the proper monitoring of drought conditions. The large spatial variability of soil moisture complicates the problem. Unfortunately, *in situ* soil moisture observing networks typically consist of sparse point observations, and conventional numerical model analyses of soil moisture used to diagnose drought are of coarse spatial resolution. Decision support systems such as the U.S. Drought Monitor contain drought impact resolution on sub-county scales, which may not be supported by the existing soil moisture networks or analyses.

The NASA Land Information System, which is run with 3 km grid spacing over the eastern United States, has demonstrated utility for monitoring soil moisture. Some of the more useful output fields from the Land Information System are volumetric soil moisture in the 0-10 cm and 40-100 cm layers, column-integrated relative soil moisture, and the real-time green vegetation fraction derived from MODIS (Moderate Resolution Imaging Spectroradiometer) swath data that are run within the Land Information System in place of the monthly climatological vegetation fraction. While these and other variables have primarily been used in local weather models and other operational forecasting applications at National Weather Service offices, the use of the Land Information System for drought monitoring has demonstrated utility for feedback to the Drought Monitor. Output from the Land Information System is currently being used at NWS Huntsville to assess soil moisture, and to provide input to the Drought Monitor.

Since feedback to the Drought Monitor takes place on a weekly basis, weekly difference plots of column-integrated relative soil moisture are being produced by the NASA Short-term Prediction Research and Transition Center and analyzed to facilitate the process. In addition to the Drought Monitor, these data are used to assess drought conditions for monthly feedback to the Alabama Drought Monitoring and Impact Group and the Tennessee Drought Task Force, which are comprised of federal, state, and local agencies and other water resources professionals.

In this presentation, the real-time NASA Land Information System will be described and its specific use as an evaluation tool for feedback to the Drought Monitor by NWS Huntsville will be discussed.