USDA United States Department of Agriculture

Natural Resources Conservation Service

Soil Science Division

Central Appalachian Interior Mountains and Plateaus

Owensboro, KY, Soil Survey Office

Kentucky Mesonet Project Assistance

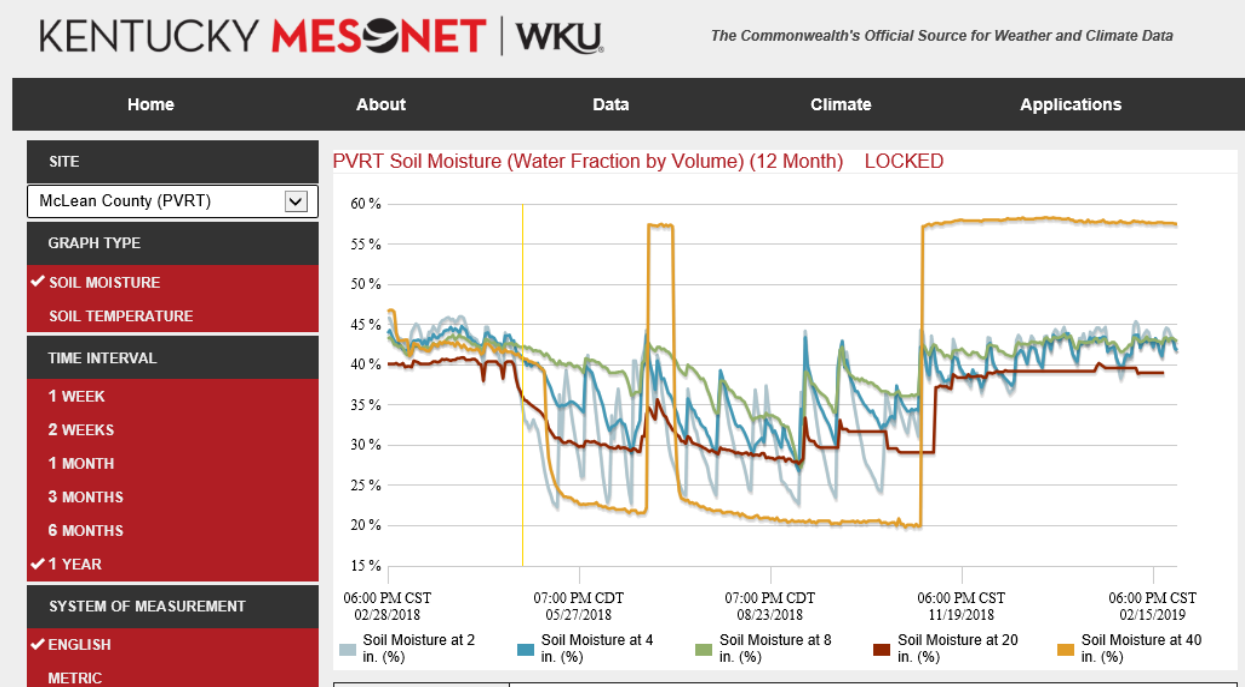
Purpose

The Owensboro, KY, Soil Survey Staff, along with Kentucky NRCS Staff are assisting the Kentucky Mesonet with soil descriptions and textural data for soil moisture and temperature data gathering across Kentucky. The Kentucky Mesonet, which is part of the National Mesonet, is the central repository for real-time collection and dissemination of non-federal surface, boundary layer, and tropospheric atmospheric weather observations in the United States. These observations supplement the monitoring infrastructure and significantly improve weather prediction, severe weather warnings, and emergency response for all regions of the country. Mesonet data aids business leaders, policy makers, and researchers in making decisions that affect the local, State, and national economies.

Sensors are placed in the soil at 2-, 4-, 8-, 20-, and 40-inch depths at selected Mesonet stations. In addition to temperature and rainfall data, soil moisture and soil temperature data are collected year-round at these sites. Detailed soil descriptions are key in determining the differences in soil moisture at different stations. Soil features, such as lithologic discontinuities (differences in particle-size distribution or mineralogy that represent differences in parent material), fragipans (water- and root-restrictive subsurface horizons), bedrock, depth to seasonal saturation, and other factors affecting soil moisture and temperature often occur between the surface and 40 inches on many of these sites.

Key Outcomes

Soil map units that have significant acreage and that are agriculturally significant are often chosen for collection of soil data. These data can be more useful on a regional scale than soils that are more limited in acreage, extent, and scope of use. Data can be beneficial in helping to determine planting dates in the spring and moisture conditions for irrigation in the summer. Describing and interpreting soils with fragipans at the Mesonet stations are beneficial in understanding why soil moisture content is greater above a fragipan than below. Ultimately, these data can influence land management practices and economic activity.



The above data (taken from the Western Kentucky University Kentucky Mesonet website: http://www.kymesonet.org/) for McLean County, Kentucky, show soil moisture over a one-year period for a soil having a fragipan. The yellow line is the soil moisture at 40 inches, which is within the fragipan horizon. All other data are from above the fragipan. The interpretation is that the soil moisture appears to be “perching” above the fragipan at this site.