

MAPPING SOIL WATER HOLDING CAPACITY IN THE STATE OF NEW MEXICO: A MODEL-BASED APPROACH.

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Soil Water Holding Capacity (SWHC) within the rooting zone of the soil (RZSWHC) is the most important parameter for calibrating soil-water-balance models. SWHC is also the most difficult parameter to measure, the reason being that SWHC depends on ill-defined concepts such as “soil water capacity at field capacity” and “wilting point” as well as an often unknown root water uptake distribution with depth. As such, an indirect method for parameterizing SWHC is necessary, given the paucity of in-situ measurements that are available. We are exploring alternative approaches to estimating SWHC: 1) SWHC is determined as a model fitting parameter, i.e. the SWHC of a soil-water-balance model is varied until agreement is found between ‘observations’ of EvapoTranspiration (ET) from an independent energy-balance model and modeled ET from the soil-water-balance model; 2) Using two independent data sets of modeled precipitation and ET, soil-moisture deficits are tracked on a daily basis for 11 years. The largest soil-moisture deficit recorded is taken to be a minimum for the SWHC within the root zone, assuming that there is no change in land cover or Hortonian runoff. We present the resulting maps of RZSWHC within our area of interest and compare their attributes. Additionally, we evaluate the ET estimates produced by the Jet Propulsion Laboratories energy-balance model that generated the independent ET estimates used to determine RZSWHC.

Keywords:

Soils, Root Zone, Soil Water Holding Capacity

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