

A Groundwater Modeling Tool for Estimating Water Salvage

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A groundwater modeling tool based on the water balance approach can be used to estimate changes in net infiltration/potential recharge when salt cedar is replaced by other plant associations. Net infiltration, defined as the water that passes out of the active soil zone or root zone into the underlying soil/bedrock, is estimated based on a daily water balance calculation of the near-surface soils. The water balance includes net precipitation as input, water storage and movement within the soil including evapotranspiration, and water moving from the active zone into the underlying soil/bedrock. The model domain is composed of a number of cells that extend from the surface to the contact with the underlying soil/bedrock. The description of each cell includes the cell depth as defined by the soil layer depth; soil type and associated properties; cell elevation, azimuth and slope; fraction of the surface covered by the vegetation canopy; and vegetation related characteristics. Each cell is composed of one to three soil layers, depending on the active soil zone depth. Downward water movement from layer to layer within a cell is based on the field capacity concept. Estimation of evapotranspiration (ET) is derived from the dual crop version of the FAO-56 method, which produces separate estimates of evaporation and transpiration. Both the field capacity approach and the FAO-56 method are computationally straightforward and do not require iterative numerical solutions. The water balance modeling tool has been implemented in MathCad, a widely available commercial software package