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# Soil Hydrology: An Overview

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## Editorial

The purpose of this research is to create a basic soil hydrology model that can be used with atmospheric general circulation models, prediction models, and other operational scenarios with little computer time and complexity. Simultaneously, a certain level of physics appears to be required for most applications. Surface evaporation, for example, is linked to soil moisture at the surface, but soil water storage and transpiration are linked to soil moisture in a deeper layer. As a result, it appears that at least two layers, including a thin top layer, are ideal. This geometry was presented in DeardorE, where the top layer's thickness was assumed to be vanishingly thin [1].

The significant relationship between hydraulic diffusivity and soil water content is a second need for most applications. The hydraulic diffusivity can change by orders of magnitude with depth or with time at a given level throughout the diurnal drying cycle as a result of this dependency. This reliance seems to be indirectly incorporated in Deardorff's two-layer model as a result of the calibration of an empirical evaporation function using measurements of drying in Adelanto loam. Because the hydraulic diffusivity is also sensitive to soil type, this indirect calibration would almost certainly have to be extensively changed for various soil types [2].

Jersey uses the fundamental soil water transport relationships to more explicitly integrate the effect of hydraulic diffusivity on soil water content in a two-layer soil model. The high-resolution soil models are based on these equations. The appropriate portrayal of the link between soil evaporation and atmospheric potential evaporation is a third critical characteristic. The traditional method of connecting evaporation to layer-average soil water content is insufficient. It is much better to use information on near-surface soil water flow since it permits management by the soil moisture profile.

From the fundamental transport equations stated above, we create a two-layer model of soil hydrology using this modelling technique for evaporation. The top layer is selected to be thin, as in Deardorff, in order to better represent the huge, near-surface gradients associated with the diurnal drying cycle. Surface evaporation may be linked to fundamental soil features using basic transport equations rather than the force-restore method [3].

Because the truncation errors associated with any two-layer model are substantial and of a different nature than the normal truncation mistakes in higher resolution models, they demand special consideration. By contrasting this two-layer model with the high resolution model, we investigate the behaviour of truncation errors. The extent of the truncation errors is influenced by the depth of the top layer and the method used to execute the numerical estimate of internal water flux [4].

As in Camillo and Jersey, we do not evaluate the effects of vertical temperature gradients on soil water flow in our analysis. There is no distinction made between liquid and vapour movement, which is often less essential. Horizontal inhomogeneity is not a problem because the model is one-dimensional. Despite the fact that soils are inherently inhomogeneous, it is believed that an adequate hydraulic diffusivity exists to approximate vertical water movement across a reference region [5].

## Conflict of Interest

None.

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