

Ground Water: Definition

Definition of terms that purport to describe the water cycle has been one of the factors which preserve an aura of the unknown in hydrologic science. Harold E. Thomas and Luna B. Leopold, in their article "Ground water in North America" (6 Mar., p. 1001), first treat ground water as water stored within the zone of saturation under the land surface, and later as "all the water beneath the land surface." I respectfully submit that this ambiguous definition will not do. Although it may seem at first trivial to quibble over terms, this is an old and deep-rooted misunderstanding among specialists studying different portions of the hydrologic cycle. O. E. Meinzer is generally credited with settling the place of ground water in hydrology (*U.S. Geol. Surv. Water Supply Paper No. 494, 1923*). He was clear in defining ground water as specifically the water contained within the zone of saturation. Meinzer went on to describe the zone of aeration above the saturation zone as the "no man's land of hydrology." As recently as the April 1964 issue of *Ground Water*, O. M. Hackett, in an editorial, again referred to the zone of aeration as "no man's land."

What is not generally recognized is that the zone of aeration, which can be a hundred or more feet deep in upland areas, is a huge reservoir for subsurface water. Year in and year out, these layers of porous, unsaturated materials receive water and slowly transmit it downward to springs, ground water, streams, and even wells. Many studies in soil physics, agriculture, forestry, and hydrology have shown that Meinzer's early concept that water in the zone of aeration can be removed only by plant or soil evaporation is clearly in need of revision. But still the idea lingers that only water within the zone of saturation is a resource worth accounting for, and huge volumes of porous materials above the water table continue to be the no man's land of hydrology.

Thomas and Leopold write,

We have been discussing ground water more or less as if it were distinct from the rest of the hydrologic cycle. Such segregation has been common among hydrologists as well as the general public, and is reflected . . . in the division of responsibility among government agencies. . . .

I wonder if it is not the other way around, that division of responsibility

was not to compartmentalization of hydrology into ground water, surface water, and no man's land.

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We subscribe to Hewlett's concern for ambiguous definitions, but apparently he has misinterpreted or misread parts of our article. He says that we "first treat ground water as water stored within the zone of saturation under the land surface, and later as 'all the water beneath the land surface.'" We did not define ground water later as "all the water beneath the land surface." Our statement reads, "Ground water, or more broadly all the water beneath the land surface, is distinctive in hydrology . . ." We believe that the words "or more broadly" fully qualify the statement to indicate that "all the water beneath the land surface" includes other subsurface water in addition to ground water.

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