## 5: 09:05-09:10. The Importance of Water Below Ground in Convection Permitting Models for Climate Simulations

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**Abstract**

Deep soil moisture exhibits longer timescales of variability than the overlying atmosphere, thus providing inertia and memory to the climate system. Groundwater systems experience a filtered and delayed response to precipitation. This in-turn implies that groundwater effects on soil moisture and vegetation may have a different timing and a different temporal scale than precipitation, providing a water source decoupled from the large temporal fluctuations characteristic of precipitation. The communication between the water below ground and the atmosphere is done primarily through plant roots. However, our current understanding of the effect of groundwater on the atmosphere relies on a very simple characterization of plant roots. In reality, roots are highly adaptive and can shift in space-time securing limiting resources. The importance of groundwater and roots on the overlying atmosphere increases with higher model resolution because, as models represent the details of local topography, groundwater flow begins to emerge in valleys. Current conceptualization of land-atmosphere interactions in numerical models used for climate projections requires an appropriate representation of groundwater and a representation of deep dynamic roots to access the slowest-varying moisture reservoir on land.