when the land surface is likely to be cooler than the water itself, rapid equilibrium with the water surface is likely to be achieved and rather high deposition velocities, in agreement with the open water surface expectations, are likely to be attained.

An associated special case concerns the effect of dewfall. Processes of diffusiophoresis and Stephan flow combine to cause a net transfer of trace gases and particles in circumstances in which condensation is occurring. The velocities of deposition involved are small; however, they do permit an accumulation of material at the surface in conditions in which the atmospheric considerations are likely to predict minimal rates of exchange (i.e., limited by stability to an extreme extent). When surface fog layers exist, the highly humid conditions near the surface will permit airborne hygroscopic particles to nucleate and grow rapidly. The process provides a mechanism for cleansing the lower layers of the atmosphere of most acidic airborne particles. The small fog droplets that are formed around the hygroscopic acidic nuclei are removed by the classical process of fog interception, to foliage and other surface roughness elements.

All of the many deposition processes considered above have aspects that are strongly surface dependent. While broad generalities can be made about the velocities of deposition of acidic species in areas of North America, there will be wide temporal and spatial ranges of deposition velocity within any such region. The detailed nature of the vegetation covering the surface is often a critical consideration. If acidic inputs to special sensitive areas need to be estimated, then this can only be accomplished if the depositional characteristics specific to the vegetation cover of the area in question are taken into account in an adequate manner.