



Multi-scale ecosystem controls of catchment water, carbon and nutrient cycling along a continental transect

Larry Band (1) and Taehee Hwang ()

(1) United States (lband@email.unc.edu), (2) United States (h7666@email.unc.edu)

Long term measurements in experimental catchments along a continental transect in eastern North America show characteristic shifts in seasonal patterns of water and nutrient export from snow dominated to snow-free climates. This behavior reflects co-evolved hydrologic, ecological and geomorphic systems, and the nutrient export patterns can be interpreted as signals of the integrated controls of biogeochemical cycling. However, local geomorphic, disturbance and micro-climate factors are embedded within the continental scale transect, and result in specific local departures in these signals from regional norms. We examine ecosystem biogeochemical behavior along a set of catchments ranging from central Ontario through the southern Appalachians with different geomorphic settings and forest species composition to deconvolve the interacting biological and physical processes and feedbacks on characteristic space/time water, carbon and nutrient patterns. Interannual hydroclimate variability and distributed ecohydrological modeling of the catchments are used to infer the impact of climate change on catchment hydrology and biogeochemistry along the transect, and to investigate the mechanisms by which more northern, snow dominated catchments may begin to evolve to more closely resemble warmer, snow-free catchments.