

Inter-storm variation in the quality, flux and biolability of tree-DOM

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Studies of DOM transport through terrestrial aquatic systems usually start at the stream. However, the interception of rainwater by vegetation marks the beginning of the terrestrial hydrological cycle making trees the headwaters of aquatic carbon cycling. Rainwater interacts with trees picking up tree-DOM, which is then exported from the tree in stemflow and throughfall. Stemflow denotes water flowing down the tree trunk, while throughfall is the water that drips through the leaves of the canopy. We report tree-DOM export from two tree species (live oak and Virginian juniper) on Skidaway Island, Savannah, GA. DOC yields were high for both species and were elevated when the epiphyte, Spanish moss, was present. Stemflow DOM had higher color per unit carbon (SUVA) irrespective of tree species or epiphyte cover. Trends in DOC concentration and yield with storm size are presented and, when scaled, were found to be of the same order of magnitude as net ecosystem exchange for the studied forest type. Tree-DOC was also found to be highly biolabile, suggesting the DOC washing off trees is a carbon subsidy to soils and other ecosystems downstream of the trees.