



Short-term responses of dissolved carbon and nitrogen concentrations to simulated emerald ash borer infestation in a black ash-dominated paired watershed

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The ash mortality caused by the invasive emerald ash borer (EAB) may affect the export of dissolved organic matter (DOM) from ash-dominated forests because of increased dead wood inputs and decreases in nutrient uptake by woody species. We implemented a manipulative study in a pair of black ash-dominated wetland watersheds in the Ottawa National Forest, Michigan to understand the impacts of ash tree mortality on the carbon and nitrogen cycle. Wetland surface water, peat pore water and stream water were analyzed for dissolved organic carbon (DOC) and total dissolved nitrogen (TDN) 2 years before and 2 years after one of the watersheds was treated by cutting all ash trees. The mean increases in DOC and TDN concentrations of stream water for the first year after ash cutting were 26% and 8%, respectively. The DOC and TDN concentrations in stream water were significantly correlated with those in wetland surface water and peat pore water. In addition, our results indicate that the DOC:TDN ratio could be used to trace the changes in both DOC and TDN dynamics caused by EAB infestation. We conclude that EAB infestation could affect stream and surface water quality because of increased DOC and TDN exports from these ash-dominated wetland forests, with implications for changes in downstream productivity.

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