

# **Preliminary Geochemical Evidence of Co-Evolution of First Forestation and Marine Anoxia in the Southernmost Appalachian Basin During the Late Frasnian Mass Extinctions**

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The global dispersal of forest and soils has been proposed as a cause for the Late Devonian mass extinction event of marine organisms, yet geochemical evidence supporting this hypothesis remains lacking. We present preliminary data from microscopic and geochemical analyses of the Upper Devonian Chattanooga Shale (Frasnian Stage and Famennian Stage). We found that biomarkers derived from terrestrial plants and wildfire are positively correlated with biomarkers and trace metals indicating an enhancement in marine anoxia, suggesting coevolution of early forest and marine anoxia. Changes in elemental and mineral compositions indicate intensified continental weathering that is concurrent with increased land plant input and marine anoxia, supporting the argument that invasion of rooted land plants to barren lands mobilized continental nutrients to coastal oceans. Collectively, our data demonstrate that multiple-proxy geochemical assessments of the Upper Devonian Chattanooga Shale offer a promising approach to evaluate the role that early forest have played in marine anoxia and mass extinctions during the Late Frasnian.

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