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Alteration of Mercury Cycling in Forested Wetland Watersheds by Common Forest Management Prescriptions

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Silvicultural practices, including clear-cutting and thinning, may negatively influence water quality and the biogeochemistry of natural elements, including toxic pollutants such as mercury (Hg). Yet, there has not been a consistent trend in the literature about responses of Hg cycling as a result of silvicultural practices in aquatic and terrestrial ecosystems.

To investigate the short-term effects of silvicultural practices on the biogeochemical cycling of Hg at a watershed level, we conducted field research with three transects covering the upland, transition, and wetlands within regeneration, thinning, and control treatments in the Santee Experimental Forest at coastal South Carolina, USA. We monitored soil moisture, temperature, redox, water table depth, and solar insolation and collected monthly composite soil samples from each site for a year.

Our preliminary results show that median soil total Hg levels for five months were similar in regeneration (51.08 ng/g), thinning (52.06 ng/g), and control (51.66 ng/g) treatments. On the other hand, the median methyl Hg level was the highest in thinning treatment (0.88 ng/g), followed by regeneration (0.63 ng/g), and then by control (0.36 ng/g) treatment. This ongoing investigation will contribute new information about the Hg response to forest management practices at a watershed level.