

Mercury releases to the atmosphere from ash amended soils

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ABSTRACT

Mercury releases to the air were measured from the following materials on a seasonal time step: 1) soils with fly ash added to simulate an agricultural field application (0.4% ash) 2) fly ash stabilized soil (~20% ash), 3) crushed stabilized soil (material from 2) that had been mixed into the soil, 4) pads of 1 cm of wetted ash that had been mixed into soil, and 5) ash and soil alone. Materials (5 cm deep) were contained with 0.5 x 0.34 m tubs that were placed out doors and in a greenhouse allowing for assessment of the influence of weather conditions on fluxes, as well measurement of fluxes under more controlled conditions, respectively. Fluxes were measured with a dynamic field chamber linked to a Tekran 2537A mercury analyzer. Data indicated that both the soil and ash type influenced the air-surface mercury exchange. For example, for one ash material emission was the dominant flux and for another deposition was dominant. This behavior associated with the pure materials was found to influence fluxes measured from amended materials. Other factors found to be important in controlling emissions include light levels, temperature, and wetness. A clear seasonal pattern of fluxes occurred from all materials. Deposition from the atmosphere was found to be an important flux especially in the dark and during cold conditions. The data set developed indicates that in order to assess the potential for releases mercury from ash amended materials to the atmosphere data needs to be collected on 24 hour and season time steps.

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