

## Enhancing Soil-Ecosystem Services of the Campus Landscape to Advance Sustainability

Soils of the OSU campus provide ecosystem services (ESs) such as biomass production, moderation of climate, and storing carbon, nutrients and water. Thus, healthy soils on campus contribute to the well-being of the OSU community and the environment. However, the soil ESs can potentially be enhanced by the application of biochar, i.e., a specific type of charcoal used as a soil conditioner.

This project supported by Ohio State Sustainability Fund determines soil biological, chemical and physical properties at four lawn sites across campus. The sites include the lawn established on the former Vivian Hall site (Fig. 1), less disturbed lawns in front of Honors House and the Faculty Club, and an irrigated lawn south of Thompson Library.

Baseline soil samples in 0-10 and 10-20 cm depth were taken at six 1 x 1m plots at each site. The six plots are placed in a line separated by 1-m buffer between the plots. Three of the plots will receive 1 kilogram of pinewood biochar each (equivalent to 10 Mg biochar ha<sup>-1</sup>; Fig. 2). Soil samples will be taken again after 6, 12 and 24 months to monitor temporal changes in soil health and assess the effects of biochar. Soil greenhouse gas fluxes will be monitored by regularly measuring the fluxes of carbon dioxide, methane and nitrous oxide on site with a photoacoustic gas monitor (PAS) attached by a sampling lid to the field acoustic chambers which remain on-site (Fig. 3).

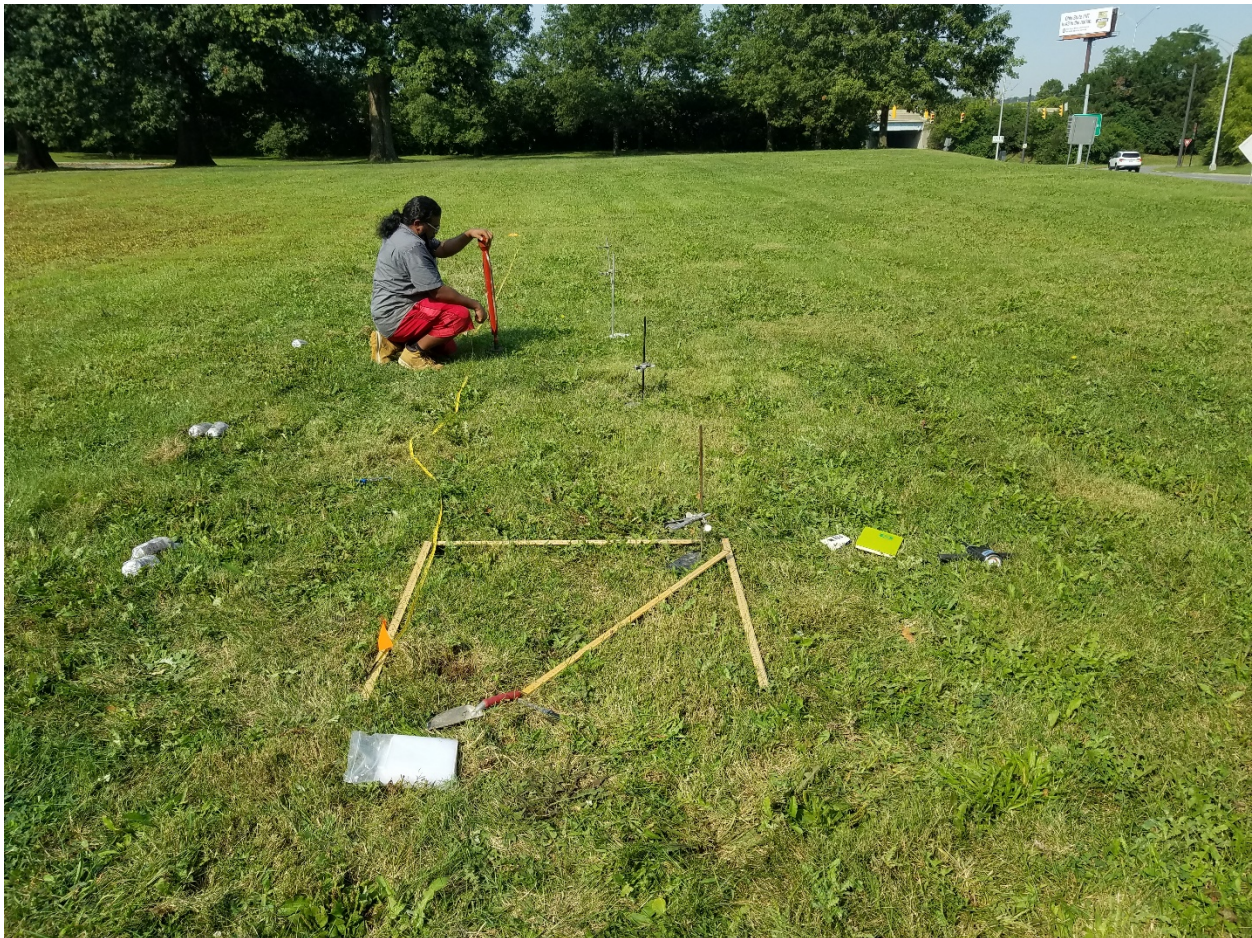


Fig. 1 Soil sampling at the former Vivian Hall site



Fig. 2 Soil surface after adding 10 Mg biochar ha<sup>-1</sup>

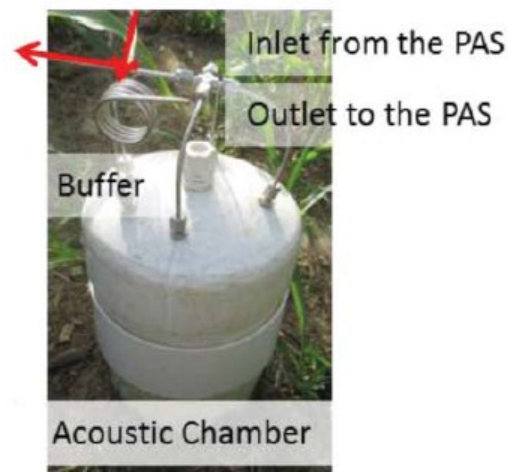
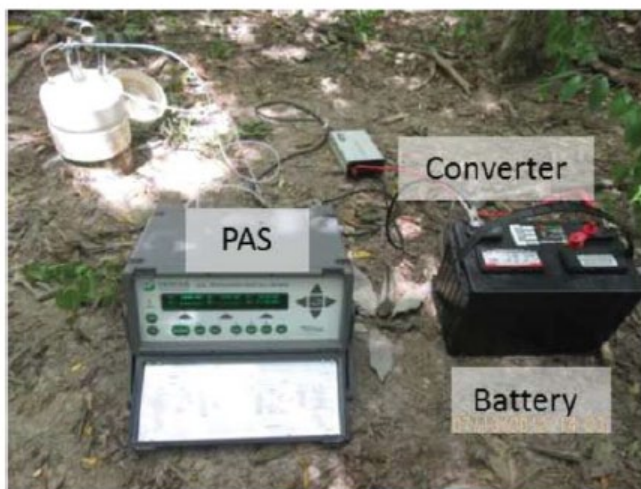


Fig. 3 Overview soil greenhouse gas-flux monitoring