

2010 GSA Denver Annual Meeting (31 October –3 November 2010)

Paper No. 248-35**Presentation Time:** 8:00 AM-6:00 PM**USING MACROSCOPIC SOIL CHARCOAL TO INTRODUCE MIDDLE SCHOOL STUDENTS AND TEACHERS TO PROXY ANALYSIS OF GEOLOGICAL ARCHIVES****[HORN, Sally P.](#)**, VALENTE, Matthew J., UNDERWOOD, Christopher A., and TAYLOR, Zachary P.,
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Soil charcoal records complement evidence of past fires that can be obtained from dendrochronological analysis of fire-scarred trees and from charcoal analysis of lake sediments. Recovering and analyzing soil charcoal also provides an excellent means of introducing middle school students and teachers to proxy analyses of natural earth archives. We have carried out authentic research on soil charcoal with students and teachers as part of an NSF GK-12 project and a Tennessee Math-Science Partnership program. Field collection and sample analysis are straightforward, and study sites are almost unlimited, as even soil in schoolyards may preserve charcoal from fires in former forests. Equipment costs are low and include a soil corer (or shovel) for collecting samples, sieves with mesh sizes of 1–2 mm for separating charcoal by wet sieving, and dissecting scopes (or magnifying glasses) to aid in charcoal discovery. Potential projects range from a simple quest to determine if fires have occurred in a particular site to more in-depth investigations of charcoal distribution by depth across spatial networks of cores; taxonomic identification of charcoal; and radiocarbon dating. Working with soil charcoal leads participants to think about processes that create, deposit, and preserve charcoal and other proxy indicators in geological archives, and about the interpretation of proxy evidence. Most teachers and students have encountered charcoal in campfires or fire places, and can put this familiarity to use in isolating fragments retained on sieves and in interpreting their findings. They already understand the link between charcoal and forest fires, and easily grasp possible connections between fire occurrence (or suppression) and both climate and human activities. That sample processing is rapid and requires only water facilitates the study of soil charcoal in middle school classrooms, in which student safety is a concern and activities must fit into class periods of limited duration. Another advantage is that the analysis of macroscopic charcoal does not require the use of compound microscopes. Such scopes are not only expensive, but in our experience are difficult for novice users, and often lead to eyestrain and frustration—and hence are not ingredients for a positive first experience with geological proxy analysis.

[2010 GSA Denver Annual Meeting \(31 October –3 November 2010\)](#)[General Information for this Meeting](#)

Session No. 248--Booth# 71

[Geoscience Education \(Posters\)](#)

Colorado Convention Center: Hall B

8:00 AM-6:00 PM, Wednesday, 3 November 2010

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