

ABSTRACT

DISSERTATION/THESIS/RESEARCH PAPER/CREATIVE PROJECT: Written In Stone: The Creation of Chemical Groups of Indiana Chert Using X-Ray Fluorescence Spectrometry and Principal Components Analysis

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DATE: December 2016

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Questions related to natural resource allocation and transport are among the most important for archaeologists interested in prehistoric trade and interaction. The replicability of sourcing these materials continues to be the largest obstacle to overcome. Chert, as one of the most widely used and effectively preserved of all natural materials throughout human prehistory, is of paramount importance for understanding prehistoric peoples. Better defined and more objective means of sourcing chert are needed. Archaeologists currently use subjective criteria to sort chert into ill-defined source categories. I propose a new chert sourcing method based on the correlation of elemental components. Using Portable X-ray Fluorescence Spectrometry, Principle Components Analysis, and Geographic Information Systems software this study will source chert in the field from the samples taken to identify groups of correlated elements allowing for the retroactive creation of source groups. Source areas will be created from source groups and will be objectively based on the composition of the material. Once created, the source areas will allow for the association of an artifact's material composition to be assigned appropriately. The source groups created will expectantly reflect formational and diagenetic processes. This method will allow for more objective sourcing analyses in the future as well as a better understanding of elemental distributions within chert.