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SIGNIFICANCE OF THE PETROFACIES MODEL

In archaeological application, petrofacies can be thought of as "tempor resource procurement zones whose sand compositions are distinct from one another at a relevant scale of investigation" (Miksa et al. 2004). This project develops and tests a model of petrofacies for the lower Angelina River basin in East Texas. The temporal period of interest lies within two divisions, the Woodland and Caloosahatchee, at the former ranging from 500 B.C.-A.D. 800 and the latter is represented by four subdivisions: Formative Caloosahatchee (A.D. 800-1000), Early Caloosahatchee (A.D. 1000-1200), Middle Caloosahatchee (A.D. 1200-1400), and Late Caloosahatchee (A.D. 1400-1600). Recent difficulties in geostatistical (INSA) research has made it challenging to locate areas of ceramic production; however, the elevated degree of geologic variability in the lower Angelina River makes it an ideal location to explore the viability of this method. Geologic provenance is of particular importance within the lower Angelina River, which is located along the southern border of the Caloosahatchee homeland. The region has not been well-explored as local archaeological projects have focused on data recovery (Corbin 1994, Illes 1998, John 1999, Magoon 2008), than basic pedestrian and testing surveys (Austin 2006; Bonne 2004; Brownlow 2002; Fields 1979; Fletcher 1998a, 1998b; Hubbard 1998; Jones 2009; Jones and Trieverwelz 2005; Middelhous 1997, 1995a, 1997b; Pettinelli et al. 2010; Rose and Jones 2010; Skinner and Tresek 1996; Trieverwelz and Bonne 2003; Triverwelz and Galan 2002). This indicates the possibility for significant returns within this case-study, while the method can be expanded to include the peripheral drainage basins.

GEOLGY OF THE ANGELINA RIVER BASIN

The complex geology in East Texas perpendicular intersects the course of the Angelina River, making it well-suited for a model of petrofacies. Local rocks and sediments range from the Precambrian to the present (by the present (TSNR 2012), and the geology of the Angelina River basin is distinctly zoned, consisting of a highly variable geologic composition. Due to the considerable degree of geologic variability throughout the study area, it is expected that tectonism will produce unique compositions within stream sediments that appear distinctly different due to the distinct geology of each zone.

DEVELOPMENT OF THE HAND SAMPLE IDENTIFICATION MODEL

Advancement of petrofacies models based upon thin-section point counts allows for rigorous quantitative treatment for problems of temporal provenance; however, the application of petrographic methods to prehistoric ceramics is limited by time and fiscal constraints (Miksa and Heidke 2001). To formulate a less imposing model, hand samples for each petrofacies will be created via point count and discriminant analysis as a means to construct the descriptive key (Miksa and Heidke 2001). This will allow for petrofacies assignment by binocular microscope, which can be substantiated by point counts and statistical analyses as an assessment of accuracy (Miksa and Heidke 2001).

Hand samples, consisting of raw sands, will be created using the remainder of the sample that was originally split and cleared to create petrographic thin-sections. These will remain within the 38-dram vial with a weighting lid to illustrate the variability within. Classification of these samples described as one of six ordinals categories (i.e., none [0%], trace [<2%], rare [0-25%], present [2-10%], common [10-40%], and abundant [>40%] (Miksa et al. 2004).

ABSTRACT

Ceramic provenance studies remain the basis of worldwide archaeological research concerned with reconstructing exchange networks, tracking migrations, and informing upon ceramic economy. Unfortunately, Texas archaeologists have been plagued with an inability to trace ceramic production sources to the same extent as researchers within other regions. Ceramic petrofacies models have been employed successfully in archaeological contexts at the San Pablo Valley, Tonto basin, Tucson basin, Agua Fria, and Gila and Phoenix basins in Arizona, but have not yet been employed east of Antioch Data resulting from the construction of an archetypal petrofacies model in the protohistoric coastal environment of East Texas could provide the necessary foundation for archaeologists to begin expanding upon the current dialogue regarding the provenance of ceramic vessels utilized by precolonial Woodland and Caloosahatchee populations.

CERAMIC PETROGRAPHY

The use of petrofacies exponentially increases the scope and utility of ceramic petrography. By noting the relative abundance of local sands instead of only ubiquitous materials, petrofacies models provide a high-resolution method of assigning ceramic provenance (Miksa and Heidke 1995). Shredds selected as the representative sample will undergo analysis with a binocular stereomicroscope to characterize three variables to of temper composition (Miksa et al 2004). Those variables consist of temper type (i.e., sand, hematite, grog, etc.), generic temper source (i.e., geographic and tectonic origin), and specific temper source (petrofacies of origin) (Miksa et al. 2004). This can facilitate the production of increasingly complex research questions for ceramic-beam sites (set at right), providing the spatial and temporal resolution needed to inform more detailed discussions of manufacture and use, ceramic economy, immigration, exchange networks, and regional temporal trends.

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