Small Scale Subsurface Sampling as a Method for Identifying Anthropogenic Features through Sediment Analysis: A Case Study from Pend Oreille County, Washington

William J. Damitio, Emily L. Whisler, Kevin Lyons, and Melissa Goodman Elgar

Department of Anthropology, Washington State University | Kikapu Tribe of Idaho

Introduction

Previous surveys identified over 500 depression features across the landscape of Frog Island (493842) - Dorwin, John T. Box Canyon Hydroelectric Project, and Melissa Goodman Elgar (2014) - Depressions 57 and 58, respectively. Our goal in this study is to determine if these features are anthropogenic in origin.

Geographic Setting

Frog Island (493842) is a point bar on the north bank of the Pend Oreille River within the Colville Indian Reservation in northeastern Washington. The Colville Indian Reservation is the largest Native American reservation in the United States.

Methods

The date and soil sample was collected in the summer of 2015 by students in a geography course at Washington State University. Depressions 57 and 58 were identified in a survey of the area to locate future samples. A bucket auger was used to collect sediment samples from a total of nine sites: three from Depressions 57, four from Depression 57, two from the most prominent depression, and two from the most prominent depression. The auger was inserted at 2-cm increments down to at least 30 cm into the underlying natural soil, or to the water table, as established by the auger. Local residents were consulted about the geology and cultural significance of the area.

Results

The analysis of the soil samples is currently ongoing.

Discussion

The aim of cultural resource management is typically to produce data through minimally invasive and cost-effective methods which are often sufficient to support nomination to the National Register. In this regard, such methods produce very limited data. This project aimed at addressing the question through an auger core survey coupled with geoarchaeological analyses. Auger cores are frequently used for site identification, but the recovered deposits are rarely analyzed and frequently discarded. Yet, when collected systematically, core samples provide valuable material for archaeological and paleoecological reconstructions (e.g., Centers 2004; 2009; Hoffman et al. 2015; Jones et al. 2015).

We demonstrate that geoarchaeological analysis of even a limited number of auger cores can provide insights into the natural and cultural processes at play in a particular locale. In some contexts, a few well-dated cores can take the place of fully excavated test pits, particularly in contexts where there are few sites in the area. These methods can also be replicated or employed in other non-invasive techniques. For example, Dorwin (2014) performed a magnetic susceptibility analysis of DST and DSTI. The results of the analysis were interpreted as evidence of burning features, though thermal origins for the phenomenon are possible. We cannot confirm or deny this using the limited data we collected, however we have determined that these two features are relatively small cultural features.

Identification of Anthropogenic Features through Coring

Comparing the particle size distribution (PSA), the results show that the mud fraction is the most obvious anthropogenic feature in the sediments. However, it is not clear if this mud fraction is the result of cultural activity or natural processes.

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Electroconductivity (EC) values for DSTI and DST were similar, indicating that these two features are contemporaneous. However, the DSTI core had higher EC values, suggesting a possible cultural influence.

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