AN ABSTRACT OF THE THESIS OF

Alexander J. Curteman for the degree of Master of Arts in Applied Anthropology, presented IN THE FUTURE.

Title: A Morphometric Examination of Lithic Artifacts from the Pilcher Creek Site (35UN147) using GLiMR: GIS-based Lithic Morphometric Research.

Abstract approved: _____

Loren G. Davis

Insert of very long and well thought out abstract here, that will make minds be blown.

A Morphometric Examination of Lithic Artifacts from the Pilcher Creek Site (35UN147) using GLiMR: GIS-based Lithic Morphometric Research

by

Alexander J. Curteman

A THESIS

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APPROVED:

Major Professor, representing Applied Anthropology

Director of the Interdisciplinary Studies Program

Dean of the Graduate School

I understand that my thesis will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my thesis to any reader upon request.

Alexander J. Curteman, Author

ACKNOWLEDGMENTS

Here I will write, with great poetic prose, about all the wonderful people without whom I would not have been able to accomplish this task.

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Chapter 1

1.1 Introduction

With the ever increasing availability of high resolution three-dimensional scanning and geographic information science software, new methods of lithic morphometric research are rapidly become both possible and practical. If it is truly the goal of the archaeologist to thoroughly and accurately record as much information as possible about their findings, then adopting these methods will soon become the new standard. Utilizing these technological resources, researchers at Oregon State University have developed GLiMR: GIS-based Lithic Morphometric Research. This software utilizes a number of ArcGIS tools to generate a large set of morphometric data which can also later be used for high resolution characterizations, analysis, and comparisons of artifact form. This research will use three dimensional digital scanning and GLiMR to examine an assemblage of lithic artifacts from the Pilcher Creek site. This assemblage includes complete projectile points of varying styles, as well as projectile point fragments, bifaces, and other miscellaneous lithic objects. The projectile points fall mostly into two different classifications, including stemmed and lanceolate forms. The benefit of performing this analysis is that a large number of morphometric measurements can be taken, which would be prohibitively time consuming to obtain by hand. These measurements can then be used to validate the original classification,

possibly find new classifications, and allow for rapid comparison with assemblages from other sites.

1.2 Significance

This is where I will talk about the significance of this work, and what contributions it will make to archaeological research.

1.3 Research Goals and Questions

The primary goal of this research is to use GLiMR to create a data rich, quantitative description of select lithic artifacts from Pilcher creek, which can be used in future cross site comparisons. In order to accomplish this, there are a number of secondary goals which must be met, which include the following. Determine which morphological features best separate the artifacts into distinguishable groups. Determine how many different classification groups the lithic artifacts fall into based on their morphological features. Lastly, determine if it is possible to also classify artifact fragments along with the complete artifacts.

Chapter 2

2.1 Pilcher Creek (35UN147)

Here I will put information about all previous research regarding the Pilcher Creek site.

2.2 Classic Lithic Morphology

Here I will discuss the ways lithic thechnologies have been examined and classified for the last 75 years

2.3 Current Technological Application

This is where I will discuss other current application of new technologies in the field of lithic morphometrics.

Chapter 3

3.1 Artifact Selection

3.2 Creation of the Three-dimensional Models

The first step in digital lithic morphometric analysis is to create a high resolution three-dimensional models of the desired artifacts. For this research, this was accomplished using a David SLS-2 Structured Light 3D Scanner and software. There are a number of benefits to using a structured light scanner. Compared to other 3D scanning techniques, such as laser scanners or photogrammetry, structured light scanners are relatively fast, create high resolution 3D models, and are not cost prohibitive. However, structured light scanners are not capable to detecting dark materials, or transparent materials, and many of the artifacts in this research fall into one or more of those categories. In order to solve this problem, a small amount of Tenactin powder spray applied was applied to the artifacts before scanning. This small white powder coating solves both the problem of artifacts being too dark, and with some obsidian and chert artifacts the problem of being partially transparent. The final product from the David Scanning software is a complete three dimensional model in the form of an obj file.

3.3 GLiMR

3.4 Statistical Analyses