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**EXAMINATION OF AGE-RELATED CHANGES OF THE AURICULAR SURFACE  
USING GEOGRAPHIC INFORMATION SYSTEMS ANALYSIS**

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**Abstract**

The task of accurately estimating the age at death of an adult individual from their skeletal remains is an important one in bioarchaeology and forensic anthropology. This study attempts to describe the age-related changes of the auricular surface through geographic information systems (GIS) analysis of a three-dimensional computer model of the area. Using a 3D laser scanner, the auricular surfaces of 69 left ilia from white and black males from the Medical Collection of the American Museum of Natural History were captured and processed for GIS analysis. Several analytical tools typically used to analyze the Earth's topography were applied to each 3D model to produce raster files that describe variations in the auricular surface. Standard deviations and means were automatically calculated for the raster files. These were evaluated for their correlation with age.

The mean values of the slope raster and logarithmic transformations of the standard deviation values of the curvature and planform curvature rasters yielded statistically significant correlations with age ( $n = 65$ ,  $p < 0.05$ ). After the sample was divided by ancestry, the only significant correlation with age occurred in the mean values of the planform and profile curvature rasters of the black subsample ( $n = 20$ ,  $p < 0.05$ ). Future work in refining the process of data collection and processing, more sophisticated statistical approaches, a focus on specific areas of interest on the auricular surface, and a greater sample size may produce more useful results.