

USING GIS TO MAP AND CATALOG PALEONTOLOGICAL AND GEOLOGICAL SPECIMENS OF THE MIO-PLIOCENE GRAY FOSSIL SITE, WASHINGTON COUNTY, TENNESSEE, USA

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The Gray Fossil Site, located in northeastern Tennessee, was discovered by road construction crews during the summer of 2000 and has been systematically excavated since late 2001. The late Miocene-early Pliocene site is a former sinkhole that in-filled with organic rich clay. The site preserves an astounding array of flora and fauna that includes newly named species of red panda, badger, rhinoceros, plants, and soon to be named alligator, turtles, and shrews. Mapping of the site's geological and paleontological specimens using traditional surveying equipment (i.e. total station and data collector) began in the very early stages of excavation. Control points on the site were established from nearby United States Geological Survey benchmarks. Using the NAD 1983 Tennessee State Plane coordinate system, a one meter grid was established covering the entire five acre site. Isolated excavation sites, or test pits, are planned and established by surface collecting and then are systematically excavated based on the meter grid system. All fossil specimens uncovered in the excavation process are surveyed *in situ* within the meter square and are assigned an x,y, and z coordinate and a field number. The collected coordinate data is converted to a usable Geographic Information System (GIS) format which provides both two dimensional paper maps and three dimensional digital maps. The coordinates collected are accessioned into the database with the rest of the specimen information. The GIS serves as the primary cataloging database for the collections that are housed in the natural history museum located on the Gray Fossil Site. The current GIS software that is used as the database is ArcGIS 10.2. The major advantage for using GIS as the primary database is to geographically represent paleontological and geological specimens while also accessing all of the specimens' associated data in one interface.

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