



### A93 **Geographic Information Software (GIS) Application for Building a Nationally Representative Forensic Taphonomy Database**

*Katherine E. Weisensee, PhD\**, Clemson University, Clemson, SC 29634; *Blake Lytle, MS*, Clemson University, Barr Hall, Clemson, SC 29634; *Patricia Carbajales, MS*, Clemson University, Geospatial Technology, Clemson, SC 29634; *Anne Shillinglaw, BS*, Clemson University, Clemson, SC 29634

---

**Learning Overview:** After attending this presentation, attendees will understand the implications of the lack of a robust dataset for examining and improving methods to determine the Postmortem Interval (PMI) in forensic investigations. Attendees will learn about a new application, geoFOR, which will be used to address this gap in the research.

**Impact on the Forensic Science Community:** This presentation will impact the forensic science community by demonstrating a novel mechanism to collect data about decomposition using a crowdsourced data model. This presentation will introduce a new application, geoFOR, for creating a reference database of decomposition and environmental variables from which improved methods from determining PMI can be developed.

PMI determination is a critical piece of information to determine when human remains are discovered. An accurate determination of PMI can facilitate the identification of an unknown individual and help to reconstruct the events around the time of death. A major weakness with the current state of the research is the lack of a reference dataset with a large number of cases from which research questions regarding factors impacting the rate of decomposition can be addressed.

This presentation will be used to demonstrate an application that can be used by practitioners using crowdsourced data to collect information from scenes where human remains are found. This research utilizes a spatially coded, Geographic Information Systems (GIS) application that is accessible from mobile devices and tablets, among other devices. Forensic investigators working on a case use the app to record basic scoring information on the state of decomposition, upload photos of the state of decomposition, and the GIS software records the location of the discovery. The application will be available for use by investigators from across the country and internationally in order to develop a large reference sample that will be used to create improved models for determining PMI.

Much of the PMI research has focused on a few outdoor research facilities. These are geographically circumscribed areas that have a limited range of environment factors that characterize the variables known to impact the rate of decomposition. The other major source of data for PMI methods are retrospective case studies that are based on small sample sizes and are regionally specific. A review of recently published research articles demonstrates the dependence on small samples for modeling the complex decomposition process.

The decomposition process is influenced by a wide range of factors, both intrinsic to the individual and extrinsic environmental variables. The only way to develop accurate models of this complex system is to have sufficiently large sample sizes. In the absence of a large dataset, a scientific investigation of PMI is severely limited. The small sample sizes and dependence on case studies has limited research in PMI. Previous research has demonstrated that there are multiple factors that impact the rate of decomposition, and we cannot hope to develop a robust and multifaceted model in the absence of a representative and large dataset. In order for the field to move forward and to develop models that are reliable, useful, and with known error rates, a large dataset is necessary and currently missing from the field. The forensic community can work together to construct a reference set to build models of decomposition and improving methods for determining PMI when remains are discovered.

---

**GIS, PMI, Database**