

Fort A.P. Hill Test Site Characterization, Mapping and Imaging

The goal was to conduct a soil characterization and to classify the roadways and test courses within the countermine facility at Fort AP Hill, Virginia. This project was necessary because at the time Fort AP Hill had characterized all its test courses for surface roughness but needed the underlying course material characterized. This task was conducted as part of a larger project under the Night Vision and Electronic Sensors Directorate (NVESD). Our results were reported in 2011. This project was unique in that we worked with cadets at the US Military Academy (USMA) to give them real-world experience with specific types of equipment and to make field measurements that were useful in an applied setting.

Summary of Project Details: Data collection was done by USMA cadets, with training from DRI personnel. Each cadet was trained for a specific piece of equipment, which included three penetrometers and a nuclear density gauge. Data collection sites were recorded using GPS. We had the collect soils data at two primary locations at Fort AP Hill, along with photographs at each sample point. The data collected pertained to factors of the soil's ability to maintain structural integrity under applied force levels and how much pressure was needed to penetrate the soil. We analyzed soil samples at DRI for bulk density, dry density, and percent moisture. The imagery was collected and processed to be used in an immersive experience within a GIS.

Management Implications: The Department of Geography and Environmental Engineering successfully supported us (DRI and NVESD at Fort AP Hill) in the development of data for test course evaluation. We were successful at collecting data on raw soil, soil characterization at depth, terrestrial iPIX® images, and positional location. A total of 57 soil samples were characterized. Our results were provided in extensive tables, figures and charts. All of our objectives were accomplished. Overall, USMA cadets were provided a hands-on, application-based learning experience to heighten their understanding of data collection through applied research in the studies of environmental science and geospatial information science.

