

Updating the University of North Carolina at Pembroke Map

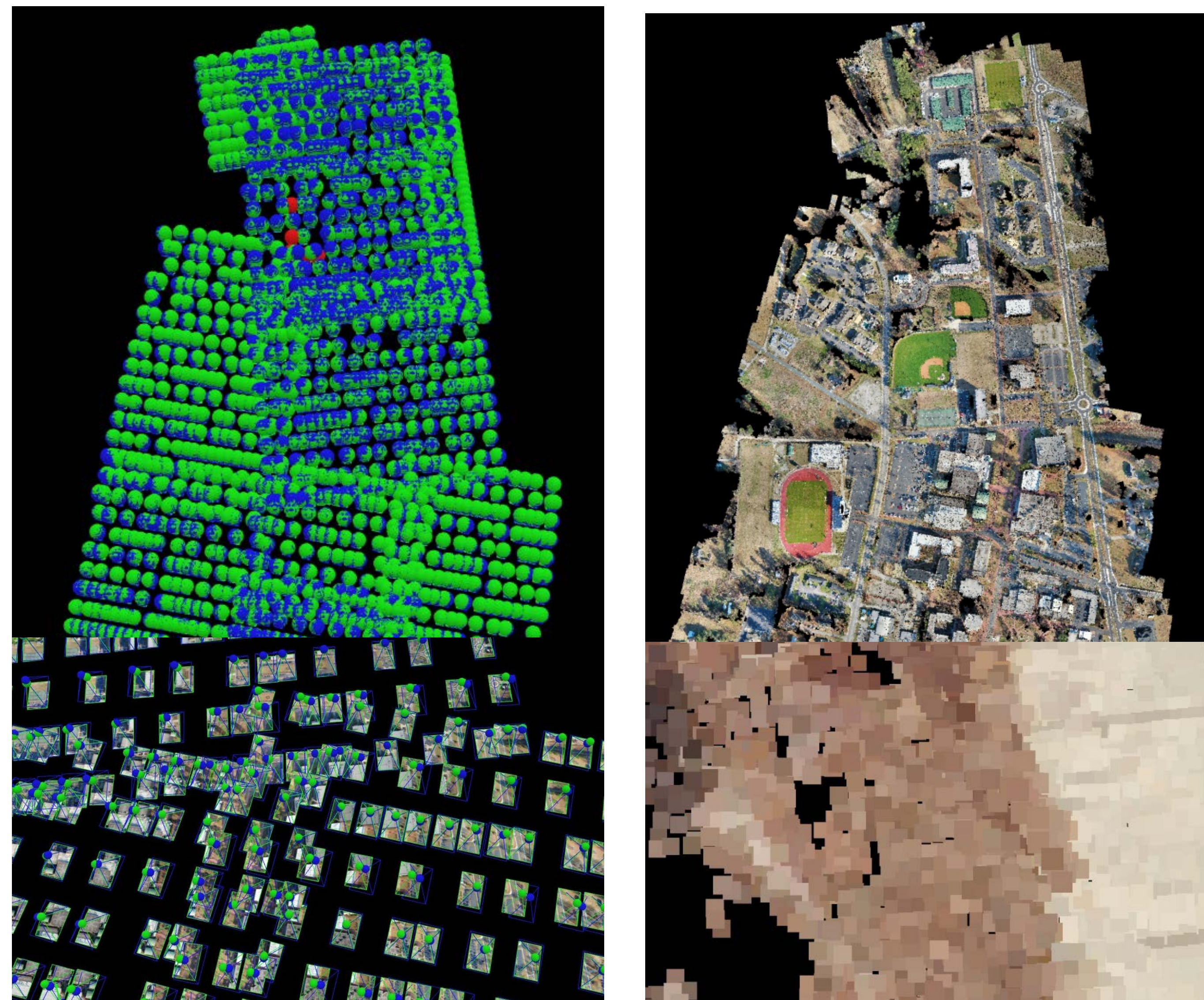
Amanda Gallavan, Geology and Geography

Mentors: Justin Duncan, UNCP Facilities Management
Dr Jesse Rouse, Geology & Geography

Introduction

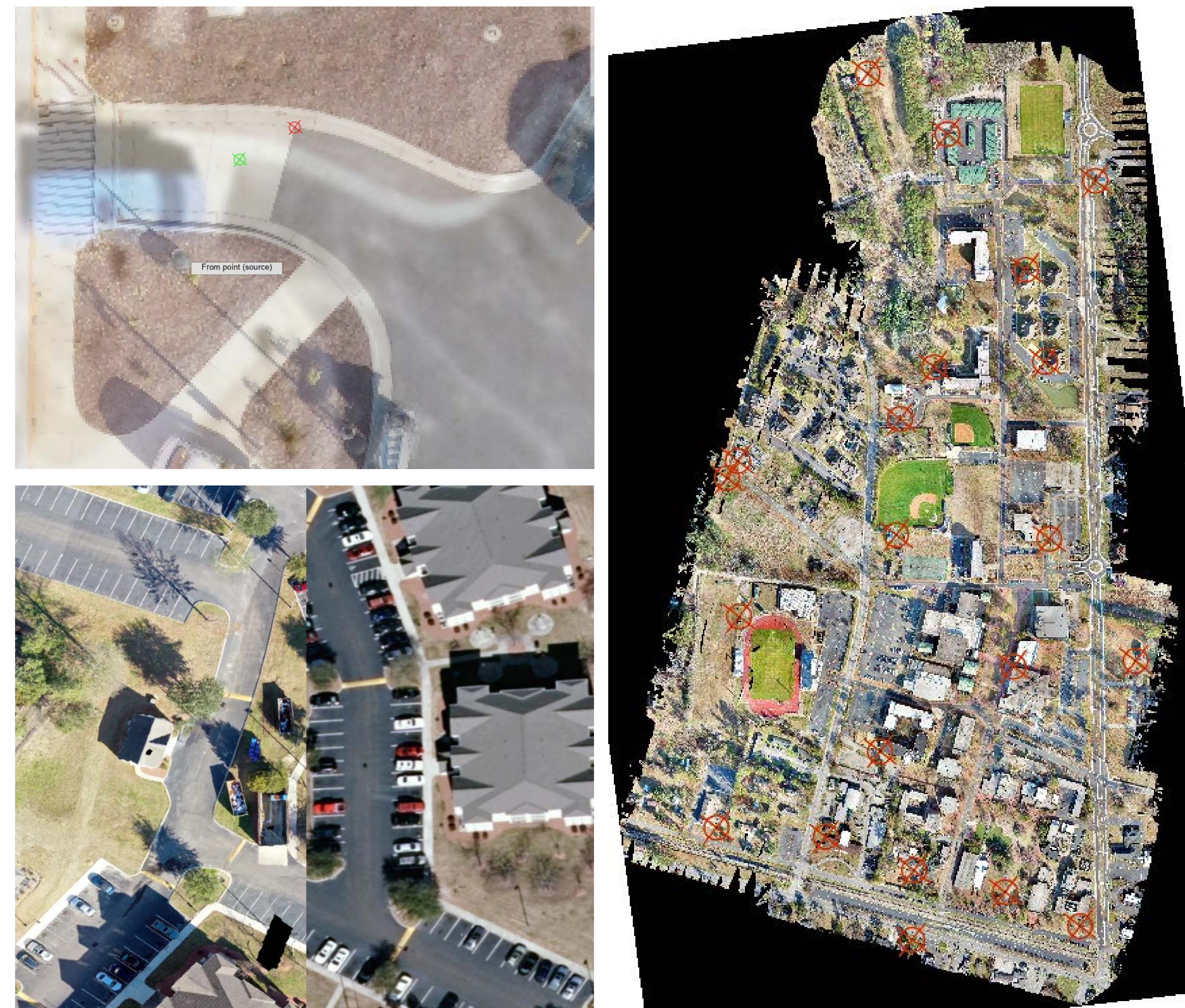
With the recent alterations on N. Odom St. and Prospect Rd. near UNC Pembroke and other construction changes on campus, updates to campus data were needed. The current mapping data has not been updated in five years, leaving the campus map inaccurate. The campus structures, roads, parking lots, and sidewalks were the focus of the current project to update campus facilities map. Drone imagery was collected with Pix4Dmapper and processed with Agisoft Metashape to capture the most up-to-date information of UNC Pembroke. The drone imagery was then additionally georeferenced to previous digital geographic information from the USGS and previous campus data using ArcGIS Pro. This poster will cover the process of updating the campus map data and highlight the changes from previous data.

Drone Data



On the left is 1,797 photos taken from a drone after being aligned using the GPS coordinates that were gathered for each photo during the flight. On the right is a georeferenced photo created by the software through mosaicking. The process involved several steps including creating a point cloud by comparing the images, a polygonal mesh is built from the point cloud, the mesh is used to generate a Digital Surface Model (DSM), and the DSM and images are used to generate the Orthomosaic.

Georeferencing



The orthomosaic raster is brought into ArcGIS Pro for a minor transformation to be georeferenced to existing aerial imagery. To align the image I had to add control points to fixed locations after which the transformation was applied.

Digitizing the roads



The upper left shows the mid-line route data from NCDOT. The upper right adds a buffer around the centerline that was used as the basis for digitizing the changes. The bottom shows the manual vector adjustments with a closeup showing the level that digitizing was conducted (larger than 1:200).

Results



The map above was made using the updated data. However, this will in turn need to be updated to reflect the new building and sidewalks currently being built. Having the information up-to-date is important in supporting the efforts of Facilities Management as well as others who have data that needs to be mapped on campus.

Acknowledgments

Drone Images provided by Dr. Jesse Rouse of the Department of Geology and Geography. This project was conducted as part of a position with Facilities Management under the supervision of Justin Duncan.