

DIGITAL PRESERVATION AND 3D RECONSTRUCTION OF DINOSAUR TRACKS AND TRACKWAYS USING PHOTOGRAMMETRY IN THE GLEN ROSE FORMATION (ALBIAN, EARLY CRETACEOUS), CENTRAL TEXAS

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In Central Texas, the Glen Rose Formation (Albian, Early Cretaceous) preserves numerous tracks and trackways of sauropods, theropods and ornithopods occurring in marginal-marine deposits. While bones can inform about anatomy and physiology, tracks lend valuable insight into the behavior, locomotion, and paleoecology of dinosaurs living at that time. Unfortunately, urbanization, seasonal flooding and weathering processes compromise the integrity of exposed tracks. The use of 3D models offers an affordable and minimally invasive method of capturing and preserving at risk dinosaur tracksites. Digitization of ichnology provides an opportunity for faster collaboration, preservation of geological features for future generations and production of educational resources that may otherwise be physically unavailable. The aim of this research is to revisit historic, traditionally documented dinosaur tracks in central Texas using high-resolution photogrammetry techniques to produce 3D models that will be made available to the general public. Over 6000 high-resolution images were captured through the use of two unmanned aerial systems (DJI drones) deployed at three localities in Central Texas (Blanco, Leander and Startzville). A total of 11 individual models were constructed to display 28 trackways and over 300 individual track impressions. The photographic data were manually reviewed and hand selected for clarity to construct a robust 3D model of each trackway that can be used for both qualitative and quantitative analysis. False color overlay was applied to highlight the footprint morphology and surface features. Future plans include the repeated digital archiving of selected trackways to provide a reliable method of assessing the physical changes that have occurred at the location within a year-long period. Results will be integrated into an open-source database that will be disseminated to the public through the Witte Museum in San Antonio, Texas. The goal is to create a platform where shared data can be used for scientific research to broaden participation and appreciation of local geologic resources.