

Identifying Ancient River Channels and Faces using Ground Penetrating Radar: Brunswick, Georgia, USA

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The Princess Anne formation has been previously interpreted as a late-Pleistocene barrier island chain that was deposited ~40 thousand years ago, extending across Brunswick, GA. Historically, this geologic formation has yielded exceptionally well-preserved fossils such as *Mammuthus columbi* (Columbian mammoth) and *Bison latifrons* (long-horned bison). Previous studies have hypothesized that these fossils were situated in “cut-and-fill” channel structures (i.e., paleochannels) that later dissected the barrier island deposit ~20 thousand years ago. We performed a high-resolution (200 MHz) ground-penetrating radar (GPR) survey to identify any channel-like structures, in addition to subsurface features related to the formation and evolution of the ancient barrier island. In total, 3.2 km of GPR data were collected in both shore-normal (east-west) and shore-parallel (north-south) directions at the Federal Law Enforcement Training Facility (FLETC) in Brunswick, GA. An erosional truncation, likely related to an ancient intense storm, was imaged in a shore-normal profile. The apparent easterly dip of this erosional truncation is significantly steeper (9.85°) than the surrounding accretionary beach strata (2.53°). Additionally, a half-ellipse shaped structure was imaged in the subsurface that was interpreted to be a paleochannel. This interpreted paleochannel is orientated in a north-south direction and is 60 m wide by >4 m deep. The paleochannel appears to have migrated 50 m to the east while it was active. Preliminary data compliments the hypothesis that paleochannels dissected this ancient barrier island. Future work will include sediment coring to confirm the presence of the paleochannel.