

# Mark Pierce, Civil Engineering

---

**University:** University of Missouri

**Year in School:** Senior

**Hometown:** Richardson, Texas

**Faculty Mentor:** Dr. John J. Bowders, Civil & Environmental Engineering

**Funding Source:** College of Engineering Undergraduate Research Option

## Properties of soil samples from below prehistoric Lake Agassiz

*Mark Pierce and John J. Bowders*

Prehistoric Lake Agassiz, located in present day North Dakota, was a large lake (larger than all of the existing great lakes combined) fed by glacial runoff during the last ice age. The lake created a soft clay soil deposit, which was investigated. Thirty-eight (38) three-inch diameter Shelby tube samples were obtained from Grand Forks, North Dakota, to determine the soil properties of the soil profile below the Prehistoric Lake Agassiz. A series of thirty-eight (38) laboratory miniature vane (MV) shear tests, twenty (20) unconsolidated-undrained (UU) triaxial compression tests, twelve (12) consolidated-drained ( ) triaxial compression tests with pore pressure measurements, and twelve (12) constant rate-of-strain (CRS) consolidation tests were conducted to determine the strength properties of the soil deposit. The index properties were determined by obtaining soil moisture content, Atterberg limits, specific gravity of soil solids, and grain size distribution using hydrometer analysis. These tests proved to be sufficient in determining the strength and index properties of the soil samples from below prehistoric Lake Agassiz.