

# 13.17: Pore Pressure Responses to Changes in Total Stress: Current Work and Future Plans

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## ABSTRACT

I present my current work and future plans on measuring B values in the laboratory. B defines the change in pore pressure due to an incremental change in isotropic (uniform) stress. It is a function of porosity and fluid, solid-grain, and bulk compressibilities. I incrementally load my specimen to 275 psi, then incrementally unload to 5 psi. Stress increments are 49 psi with a constant back-pressure of 29 psi. After every stress increment, I allow the specimen to consolidate for 24 hours. I then close the drainage valves and perform 3 separate B-tests by adding a confining stress of 5, 10, and 15 psi, respectively. Preliminary results on resedimented Boston Blue Clay indicate the stiffness of the specimen increases with mean effective stress (Fig 1.); furthermore, this results in a decrease in B-values (Fig. 2). My results also indicate that the B-values during loading are different than the B-values at the equivalent effective stresses during unloading (black (loading) vs. white (unloading) squares in Fig. 2) Ultimately, I will perform high stress and pressure B measurements on Wolfcamp mudrock from the Delaware Basin.

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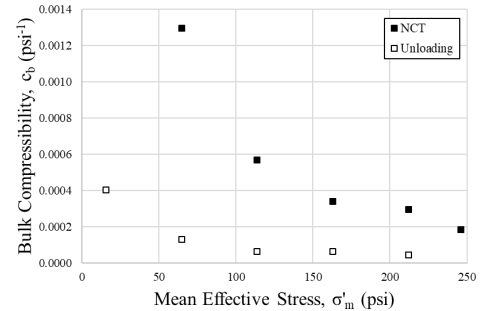


Fig 1: Experimentally measured bulk compressibility values on Boston Blue Clay using a low-stress (300 psi) triaxial system. Black squares indicate measurements made after every loading increment, white squares after every unloading increment.

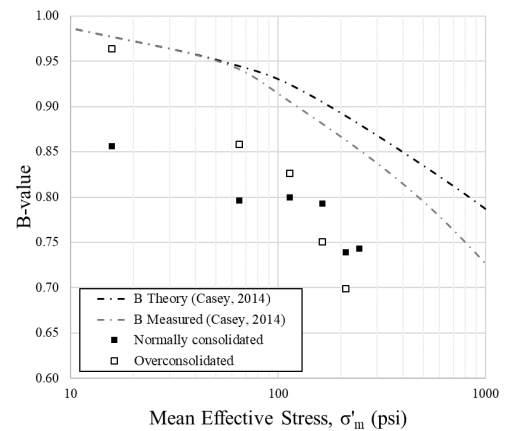
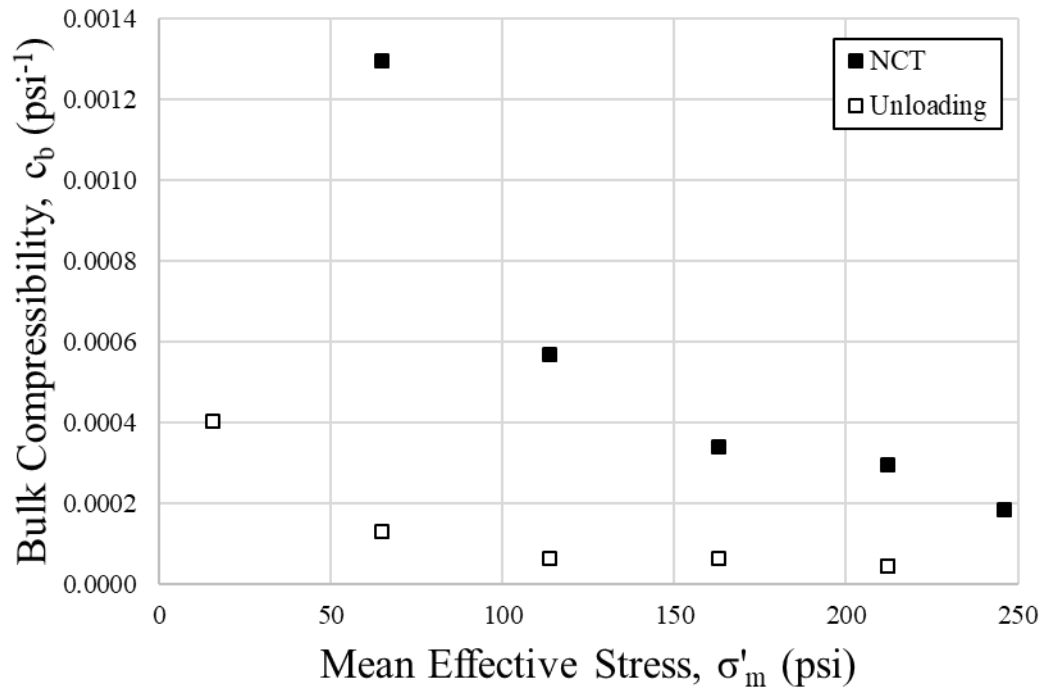
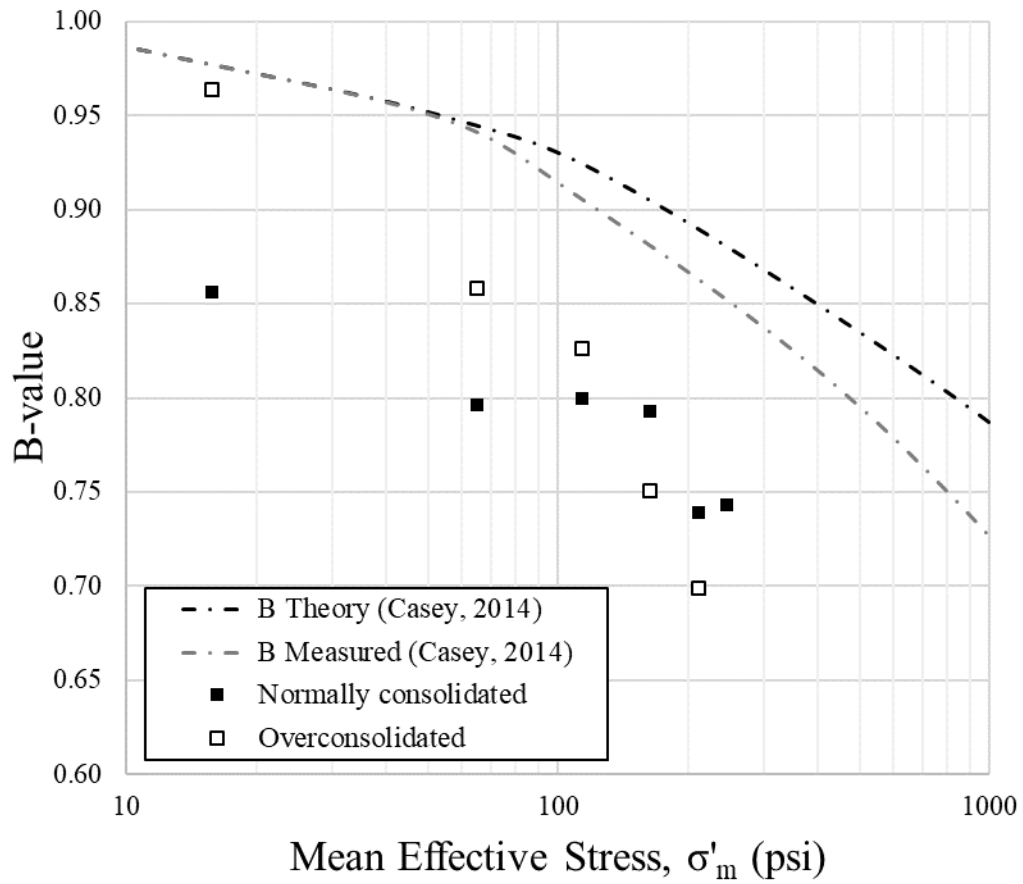


Fig 2: Experimentally measured B-values on Boston Blue Clay using a low-stress (300 psi) triaxial system. Black squares indicate measurements made after every loading increment, white squares after every unloading increment.



**Fig. 1:** Experimentally measured bulk compressibility values on Boston Blue Clay using a low-stress (300 psi) triaxial system. Black squares indicate measurements made after every loading increment, white squares after every unloading increment.

[Back](#)



**Fig. 2:** Experimentally measured B-values on Boston Blue Clay using a low-stress (300 psi) triaxial system. Black squares indicate measurements made after every loading increment, white squares after every unloading increment.

[Back](#)