

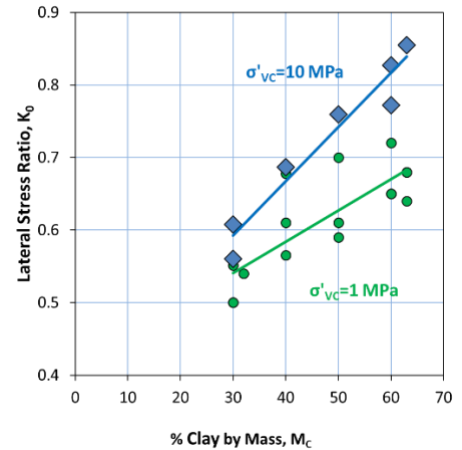
# 11.20: Variations in Strength Properties of Mudrocks by Stress and Lithology

Mark Zablocki, Tufts University

## ABSTRACT

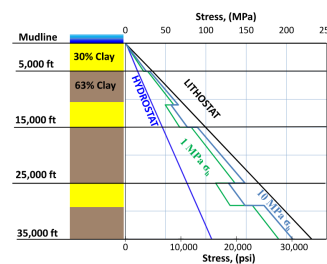
This study makes use of  $K_0$ -consolidated undrained triaxial compression tests to study the behavior of mixtures of Resedimented Gulf of Mexico Eugene Island (RGoM-EI) and Min-U-Sil. Specimens were prepared using standard resedimentation techniques and compressed to 1 MPa and 10 MPa prior to shear.

Friction angle decreases continuously with increasing clay content and is much more stress sensitive in the clay supported domain. The lateral stress ratio increases with both clay content and stress level. The lateral stress ratio is much more sensitive to stress level as clay content increases. An empirical model captures the lithology and stress dependence of the lateral stress ratio. The empirical model was used to predict the least horizontal stress as a function of stress and lithology for in a fracture gradient prediction.



**Fig 1:** Variation of Lateral Stress

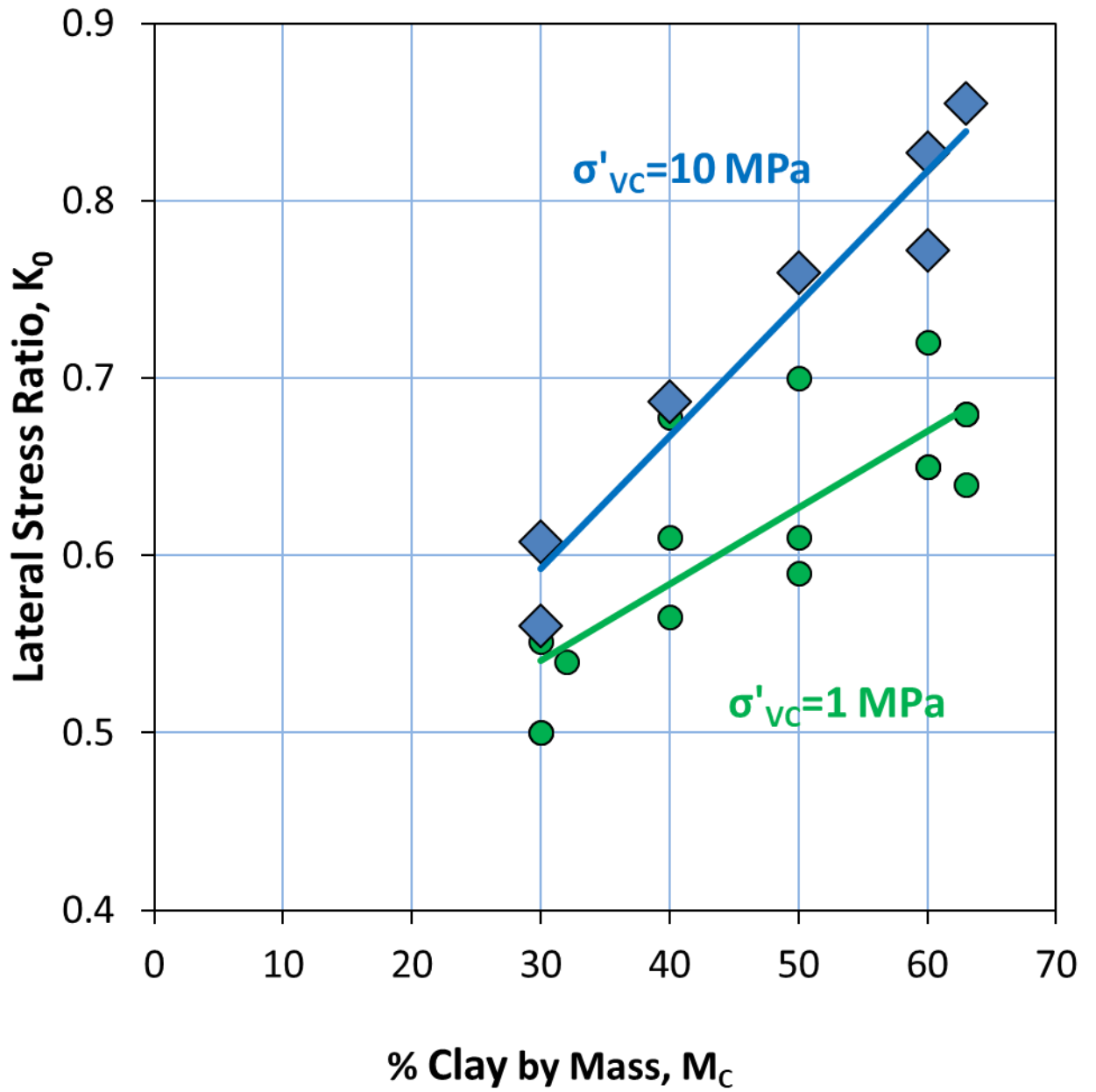
Ratio by Lithology at vertical consolidation stresses of 1 MPa and 10 MPa.



**Fig 2:** Simplified basin and fracture

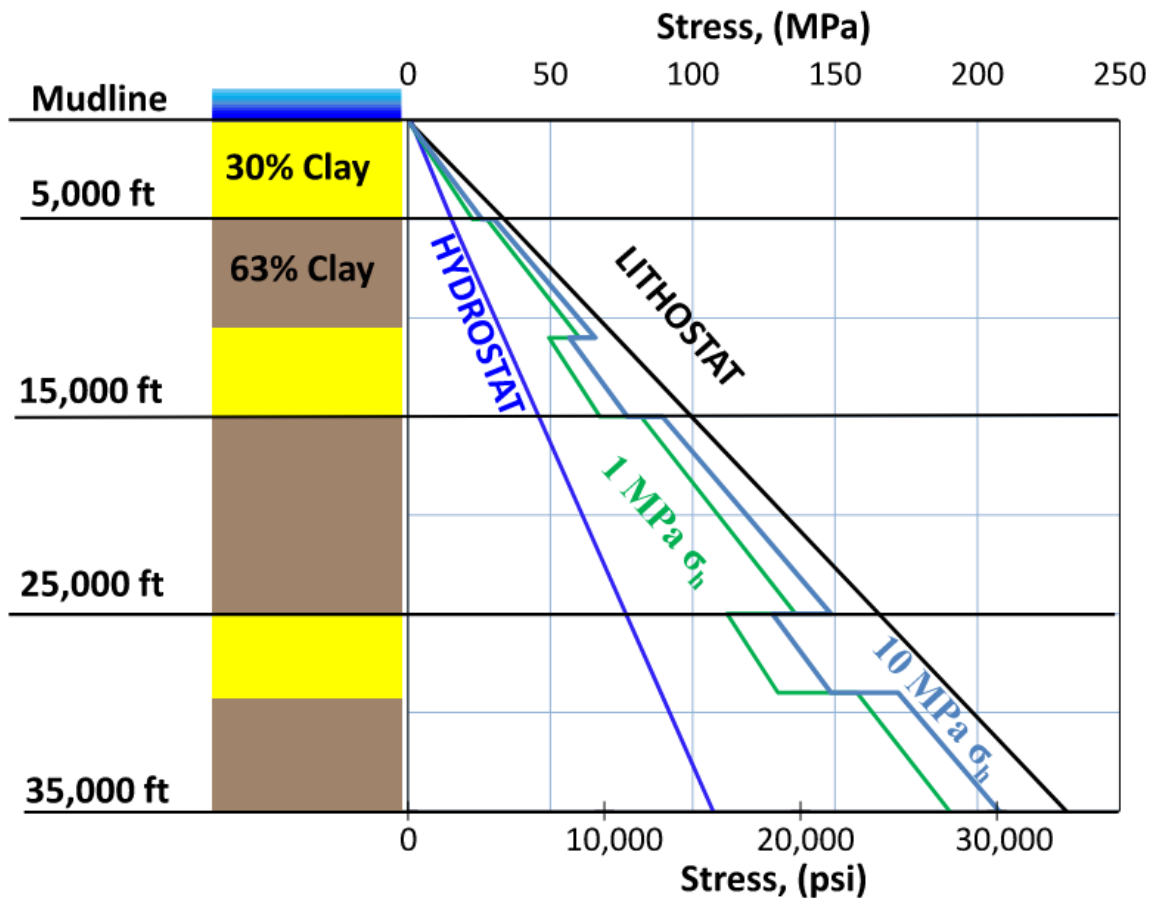
gradient used to illustrate the sensitivity of  $K_0$  to stress and lithology.

**CLICK ON IMAGE FOR LARGER VIEW**



**Fig. 1:** Variation of Lateral Stress Ratio by Lithology at vertical consolidation stresses of 1 MPa and 10 MPa.

[Back](#)



**Fig. 2:** Simplified basin and fracture gradient used to illustrate the sensitivity of  $K_0$  to stress and lithology.

[Back](#)