

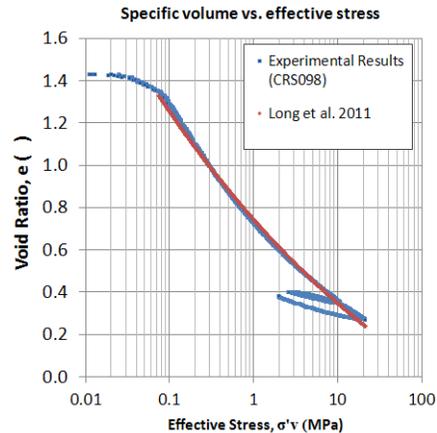
# Initial characterization of Resedimented Gulf of Mexico Mudrock

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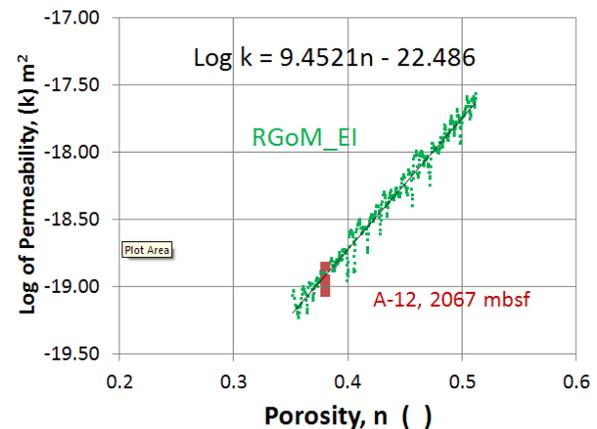
## ABSTRACT

Resedimented specimens are used to characterize the geotechnical and geophysical behavior of soils and mudstones independent of the variability of natural samples and without the effects of sampling disturbance. Previous investigations of resedimented offshore Gulf of Mexico sediments (e.g. Mazzei, 2008) have been limited in scope. Core, consisting of silty clay and clayey silt of Pliocene and Pleistocene age from two wells in the Eugene Island Block 330 oilfield, offshore Louisiana, has been crushed and homogenized to provide material for large-scale systematic studies such as those previously performed on Boston Blue Clay. The resulting material is approximately 61.5% clay sized particles (<2  $\mu\text{m}$ ) with the remainder being less than 200  $\mu\text{m}$  in diameter. The clay fraction is dominated by smectite. The Liquid limit is 87 and the plasticity index is 63, making this a very high-plasticity clay.

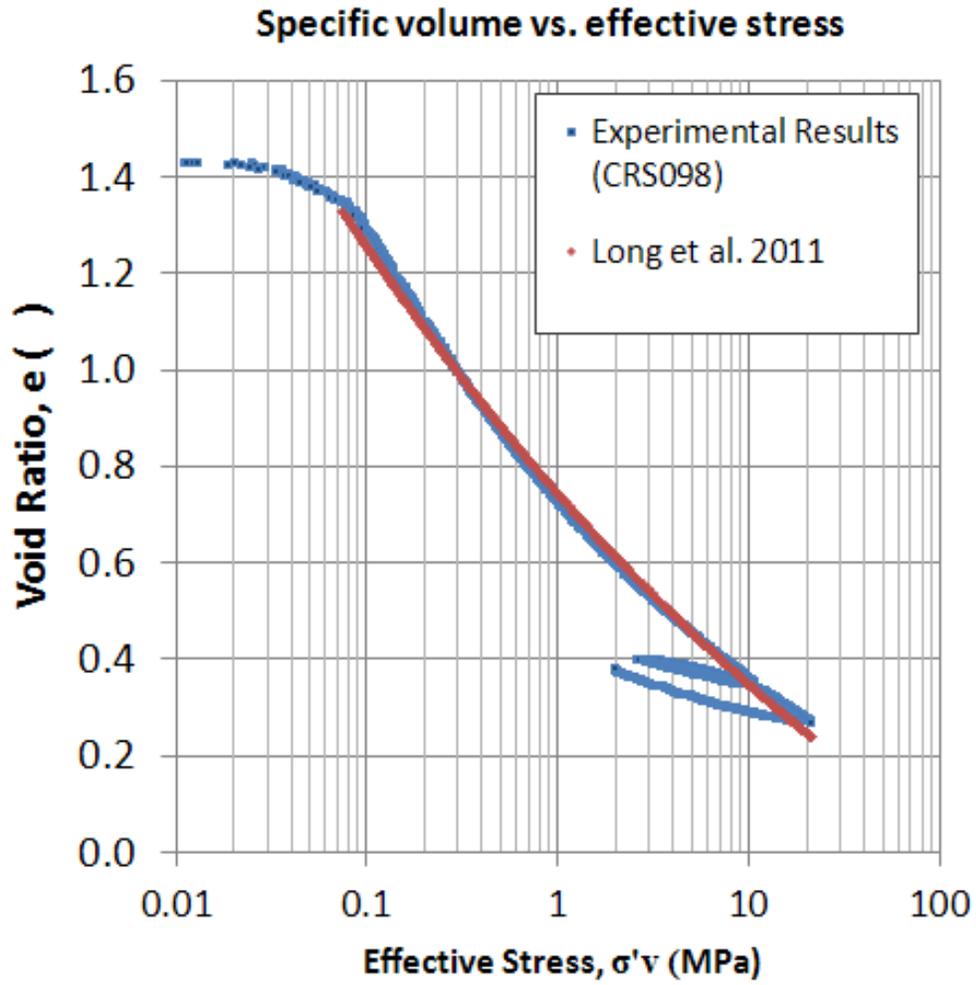
CRS testing of a resedimented specimen was conducted between 0.1 and 21 MPa. The Void ratios-effective stress relationship was within 2 percentage points of the in-situ shale porosity derived from sonic velocity log measurements by Hart et al (1995). The exponential model of Long et al. (2011) was fit to the virgin compression line (fig. 1) using the parameters  $e_0 = 1.7249$ ,  $c = -0.1125$ . Permeability derived from CRS test agrees well with previous measurements by Stump of intact core (Fig 2).



**Fig. 1.** Compression curve of CRS test (blue) and trendline  $1+e = (1+e_0)(\sigma'_v)^c$  (Long et al. 2011).  $e_0 = 1.7249$ ,  $c = -0.1125$ . Click image for larger version.

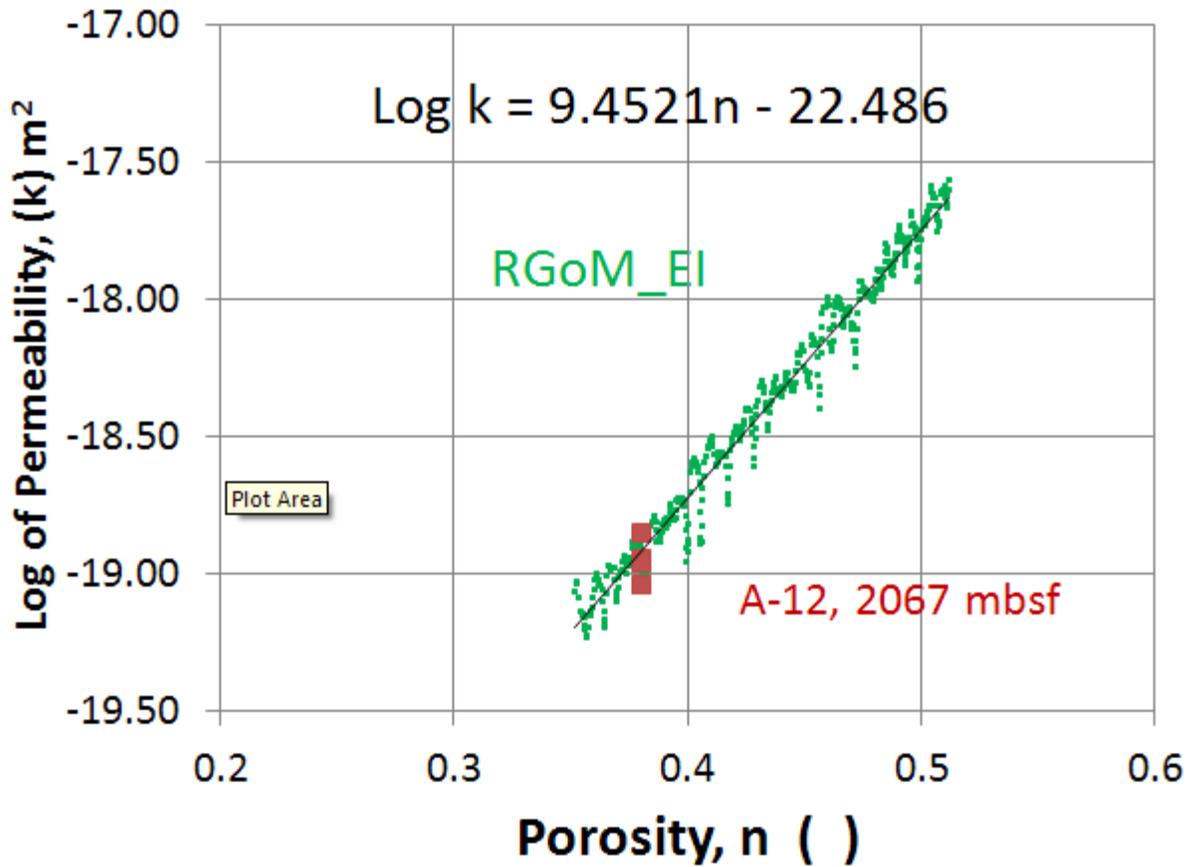


**Fig. 2:** Permeability-positivity relationship from CRS test compared to constant head permeability measurements of Pathfinder Well cores published by Stump and Flemings (2). A 10-point running average was applied to the CRS-measured permeability. Click image for larger version.



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**Fig. 2:** Permeability-porosity relationship from CRS test compared to constant head permeability measurements of Pathfinder Well cores published by Stump and Flemings (2). Square represents layer-parallel measurement, circles represent layer perpendicular measurements. A 10-point running average was applied to the CRS-measured permeability.

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