

## **Fine-scale Spatial Distribution of Organofacies in the Mowry Shale, Wind River Basin, Lander, WY**

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### **ABSTRACT**

The Cretaceous Mowry Shale is an organic rich, siliceous marine shale, and as such is a major source rock in the Western United States. Because the amount of organic material in a rock is linked to its oil and gas generative capability, several studies have outlined the lateral variability of total organic carbon (TOC) on a basin scale, covering large areas with limited sample sets. Little is known about fine-scale lateral variations of TOC on a scale of several miles, however. Over 300 samples from the same 10-cm stratigraphic interval of the Mowry Shale have been collected at regular 10 meter intervals over three outcrops near Lander, Wyoming. Pyrolysis analysis and clay mineralogical characterization of samples shows meaningful fine-scale variations and spatial trends. Average TOC of all samples is 1.65% with a standard deviation of 0.229 and a range of 1.57%, and samples are characterized as either Type III or mixed Type II/III source facies. Based on a 3D spatial model built in Petrel, TOC decreases basinward (southeast) in the study area despite a documented larger regional increasing basinward trend. Additionally, kerogen types become slightly more gas prone in a basinward direction. This suggests important localized trends, often important on a production scale, in both the Mowry shale and other fine-grained systems can be quite different than larger, generalized basinward trends.