



Machine Learning Facies Classification as Applied to the Upper Devonian Duvernay Formation, Western Canadian Sedimentary Basin

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EXTENDED ABSTRACT

The Upper Devonian Duvernay Formation is a major petroleum source rock in the Western Canada Sedimentary Basin (WCSB). With recent advances in drilling and completions technology the Duvernay has become a target for unconventional exploration and production. A refined understanding of the geologic controls on reservoir quality and producibility is needed to minimize exploration and production risks. A supervised machine learning approach was evaluated to determine whether (or not) the occurrence of reservoir and non-reservoir facies within the Duvernay could be predicted from commonly available well logs in the West Shale Basin of the WCSB. The best performing classification achieved overall accuracies between 78.2% and 84.2% for the blind test wells, respectively. Most of the misclassifications were possibly due to bias in the training data such as misclassification of facies associations with the fewest number of samples. This could be addressed by creating synthetic data.

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