
Contribution ID: **29** Type: **not specified**

# Prediction of Sand Production in Vertical Oil Wells Using Selected Machine Learning Models

*Monday, 21 July 2025 16:25 (15 minutes)*

The occurrence of sand production during hydrocarbon extraction operations presents significant challenges, as it can lead to equipment damage, pipeline blockages, and reduced well lifespan. Accurate real-time estimation of sand volume is crucial for optimising well operational efficiency and implementing cost-effective sand control strategies. This study employed machine learning models, including Logistic Regression, Decision Tree, Random Forest, and Support Vector Machine (SVM), to predict sand production in vertical oil wells. This study utilised actual field measurements of reservoir pressure, flow rates, rock strength data, and production parameters. The models underwent preprocessing and feature selection to achieve training results, followed by validation and evaluation using metrics such as accuracy, precision, recall, F1-score, and confusion matrices. Among the models employed, Random Forest emerged as the most accurate predictor, achieving 96% accuracy owing to its capability to identify complex nonlinear relationships between reservoir and operational features. This assessment confirmed the efficacy and reliability of machine learning as a method for active sand control and optimised well system development. The predictive frameworks developed in this study demonstrate their potential to reduce equipment failure, enhance well operational longevity, and promote sustainable production practices.

**Primary authors:** JOLEDO, Akorede (University of Ibandan); Mr IGWE, Efe (Renaissance Energy Company, Africa); Mr BALOGUN, Segun (University of Ibadan)

**Presenter:** JOLEDO, Akorede (University of Ibandan)

**Session Classification:** Contributed Talk

**Track Classification:** Computing: Artificial Intelligence and Machine Learning