

## Reconstructing patterns of aeolian sand accumulation in the Jurassic Gulf of Mexico using a physical model

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This project involved an experiment in a wind tunnel used to simulate wind patterns in the Gulf of Mexico during the Jurassic. The goal of the experiment was to predict the patterns of aeolian sand accumulation to better understand the locations of potential hydrocarbon reservoirs. To visualize the possible sites of sand accumulation we used an oil and zinc oxide mixture that was applied to a vertically exaggerated and scaled down three-dimensional plastic model of the Jurassic basin. The model was then placed inside a wind tunnel and run oriented with two paleo-wind directions. Locations of oil plus zinc-oxide accumulation are taken to represent possible sites of significant sand accumulation during the Jurassic. Preliminary work involved determining the ideal oil to zinc ratio to carry out the experiments. Tests were also carried out using varying vertical exaggerations on a small model section before a full-sized three-dimensional basin model with the ideal vertical exaggeration was printed. The work consisted of applying oils with differing viscosities and a specific ratio of zinc oxide to the basin model and then recording its migration when subjected to different wind directions. Time lapse photos were taken in five-second increments for step-by-step observation of evolving patterns of oil plus zinc oxide accumulation. These images were the basis of further quantitative analysis by imaging software.

**Keywords:** aeolian sedimentation, wind tunnel, Gulf of Mexico