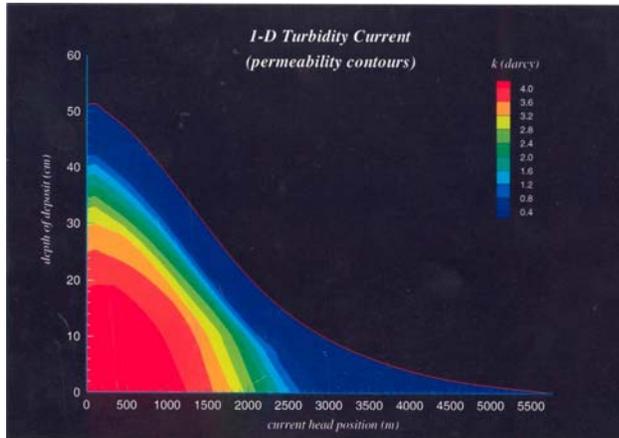


Characterization of Turbidite Oil Reservoirs Based on Geophysical Models of Their Formation



Objective of the Project:

- Test and validate new method for characterizing turbiditic reservoirs based on fundamental physics of the formation of the reservoir

Results of the Project:

- Using suspension balance model – developed simulation to predict depositional patterns and particle size-distribution for turbiditic formations
- Based on initial conditions of turbidity flow (volume of suspension, particle-size distribution, and location of source) based on information from a few cores entire reservoir can be reconstructed

U of Texas Austin

DE-FC26-01BC15352

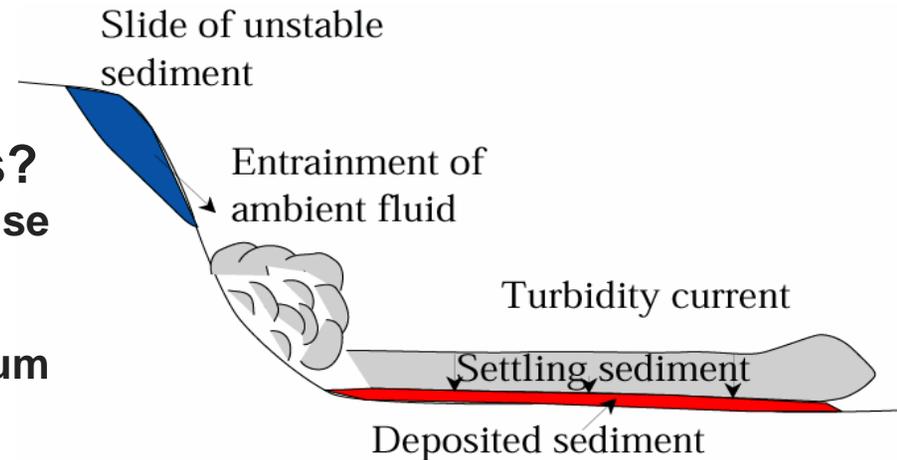


Source: U Texas Austin

Characterization of Turbidite Oil Reservoirs Based on Geophysical Models

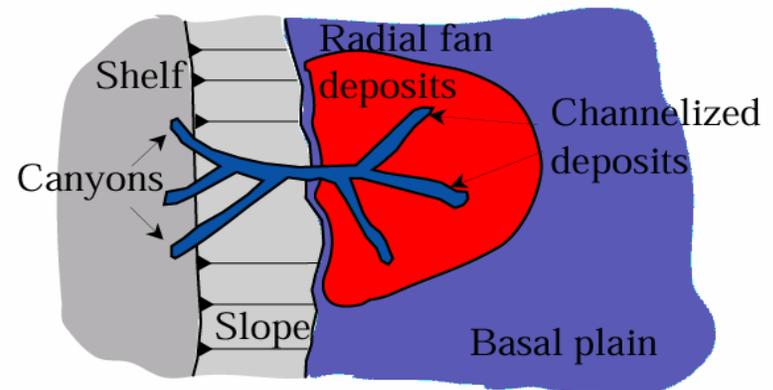
What are turbidity flows & turbidites?

- Buoyancy-driven flow of dense suspensions
- Turbidites are deposits from the flow.
- Turbidites can become traps for petroleum under propitious conditions.



Why are turbidites important?

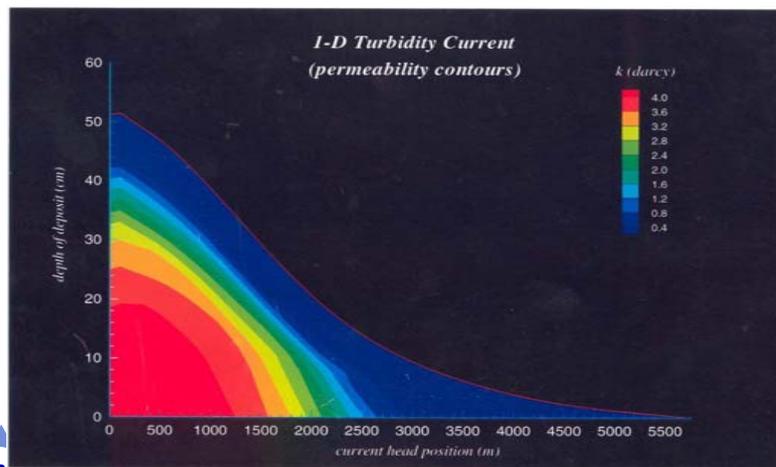
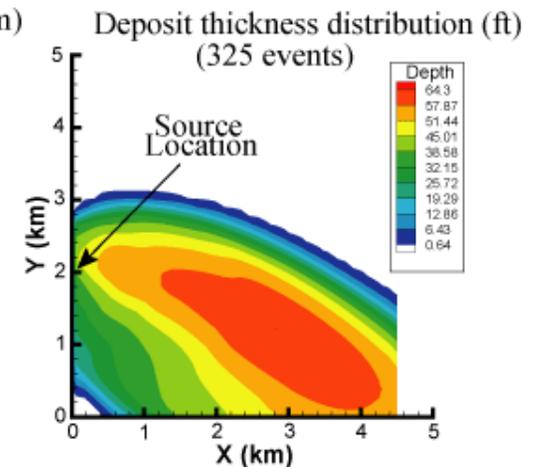
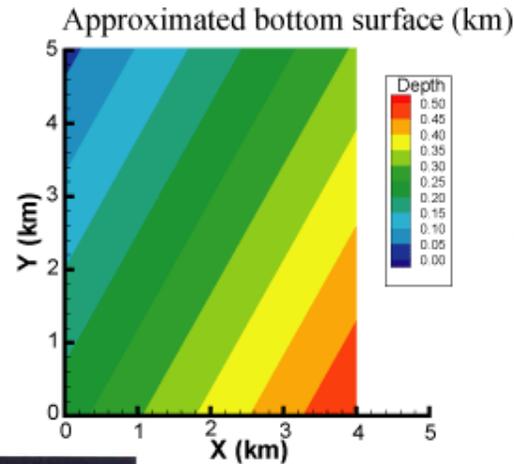
- Majority of future US-based oil will come from turbidites in deep Gulf of Mexico, plus strategic sources off coastal West Africa.
- Development of physics-based models of turbidite formation complements geostatistics by inclusion of new constraints for reservoir characterization.



Capabilities of Process-Based Turbidite Models

Simulation of turbidite formation/properties over complex topography

Multiple depositional events create a turbiditic deposit; process inputs adjusted to honor available data (cores, logs, etc.)



Given deposition and particle size distribution, petrophysical properties, like permeability can be computed as shown here for one event. Multiple events produce layered permeability

Characterization of Turbidite Oil Reservoirs Based on Geophysical Models

Publication of the Project:

- Lakshminarasimhan, S., “Study of the Flow and Deposition from Turbidity Currents,” Ph.D dissertation, The University of Texas at Austin, May 2004.
- Srivatsan, L., L.W. Lake, and R.T.Bonnecaze. “Scaling Analysis of Deposition from Turbidity Currents,” *Geo-Marine Letters* 24, pp.63-74, 2004
- Bonnecaze, R.T., and S. Lakshminarasimhan. “Characterization of Turbiditic Oil Reservoirs Based on Geophysical Models of their Formation,” U.S. DOE Technical Report , June 1, 2003.
- Bonnecaze, R.T., and S. Lakshminarasimhan. “Characterization of Turbiditic Oil Reservoirs Based on Geophysical Models of their Formation,” U.S. DOE Technical Report, April 1, 2004.
- Bonnecaze, R.T., L.W. Lake, and S. Lakshminarasimhan. “Final Report on Characterization of Turbiditic Oil Reservoirs Based on Geophysical Models of Their Formation” (in preparation 2005)

