Humid Terminal Splays as Sand-Sheet Reservoirs: A First Look at the Modern, Andean Foreland, and a New Look at the Ancient, Raton Basin

School of Geology, Energy, and the Environment

TCU SCIENCE VENGINEERING

Introduction

-Raton Basin, near Trinidad, Colorado

-Regional Distributive Fluvial System model developed by Nichols and Fisher, 2007.

-Focus of this study is on the terminal splays deposited in the distal zone of the DFS.





					1
AGE		FORMATION NAME	GENERAL DESCRIPTION	LITH- OLOGY	APPROX. THICKNESS IN FEET
TERTIARY	PALEOCENE	POISON CANYON FORMATION	SANDSTONE-Coarse to conglomeratic beds 13-50 feet thick. Interbeds of soft, yellow-weathering clayey sandstone. Thickens to the west at expense of underlying Raton Formation		500+
		RATON FORMATION	Formation intertongues with Poison Canyon Formation to the west UPPER COAL ZONE–Very fine grained sandstone, siltstone, and mudstone with carbonaceous shale and thick coal beds BARREN SERIES–Mostly very fine to fine-grained sandstone with minor mudstone, siltstone, with carbonaceous shale and thin coal beds LOWER COAL ZONE–Same as upper coal zone; coal beds mostly thin and discontinuous. Condomeratic	W. WILLIN	0(?)–2,100 ← K/T boundary
MESOZOIC	UPPER CRETACEOUS	VERMEJO	SANDSTONE-Fine to medium grained with mudstone, carbonaceous shale, and extensive, thick coal beds.		0-380
		FORMATION	Local sills SANDSTONEFine to medium grained; contains casts of		0-300
		PIERRE SHALE	SHALESilty in upper 300 ft. Grades upward to fine- grained sandstone. Contains limestone concretions	m	1800-1900



- -Modern analog in Andean Foreland, Northern Argentina.
- -DFS depositional model developed by Weissman et al, 2010. -Downstream trends: -Increasing accomodation to sediment ratio -Decreasing sand to mud ratio, sandbody amalgamation, and floodplain drainage.







Graham McGregor, Dr. John Holbrook, Robert Horner, Paula Malnis

Texas Christian University School of Geology, Energy, and the Environment Student Research Symposium, April 2017

Data Collection

















-Dutch Auger used to determine stratigraphy of TS complex. -Upon arrival, faces were exposed in river bed but not clean. -Using a shovel, machete, and paint

brush we cleaned the faces to expose the internal structures. Toal of 19 cores drilled and 8 faces exposed.





-Blakey, R.C. (2014). Paleogeography and Paleotectonics of the Western Interior Seaway, Jurassic-Cretaceous of North America. AAPG Search and Discovery Article 30392, 1-72. -Horner, R.J. (2016). Facies characterization and architectural context of terminal splay sandstone beds in the Cretaceous-Paleocene Raton Formation, Colorado. Texas Christian -Nichols, G.J., and Fisher, J.A. (2007). Processes, facies and architecture of fluvial distributary system deposits. Sedimentary Geology 195, 75-90.

-Topper, R., Scott, K., & Watterson, N., (2011). Geologic model of the Purgatoire River watershed within the Raton Basin, Colorado. Colorado Geological Survey. -Weissman, G.S., Hartley, A.J., Scuderi, L.A., Nichols, G.J., Davidson, S.K., Owen, A.,...Ghosh, P. (2013). Prograding distributive fluvial systems: geomorphic models and ancient examples: New Frontiers in Paleopedology and Terrestrial Paleoclimatology: SEPM, Special Publication, 104, 131-147.





Results Continued