## **Accepted Manuscript**

Mechanical stratigraphy and normal faulting

David A. Ferrill, Alan P. Morris, Ronald N. McGinnis, Kevin J. Smart, Sarah S. Wigginton, Nicola J. Hill

PII: S0191-8141(16)30198-5

DOI: 10.1016/j.jsg.2016.11.010

Reference: SG 3413

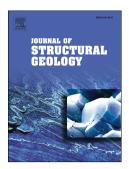
To appear in: Journal of Structural Geology

Received Date: 7 July 2016

Revised Date: 4 November 2016 Accepted Date: 24 November 2016

Please cite this article as: Ferrill, D.A., Morris, A.P., McGinnis, R.N., Smart, K.J., Wigginton, S.S., Hill, N.J., Mechanical stratigraphy and normal faulting, *Journal of Structural Geology* (2016), doi: 10.1016/j.jsg.2016.11.010.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



#### ACCEPTED MANUSCRIPT

Invited Review Paper for Journal of Structural Geology - Revised Version, 4 November 2016

### Mechanical stratigraphy and normal faulting

1 2

- 3 David A. Ferrill<sup>1</sup>\*, Alan P. Morris<sup>1</sup>, Ronald N. McGinnis<sup>1</sup>, Kevin J. Smart<sup>1</sup>,
- 4 Sarah S. Wigginton<sup>1</sup>, Nicola J. Hill<sup>1</sup>
- <sup>1</sup>Department of Earth, Material, and Planetary Sciences, Geosciences and Engineering Division,
- 6 Southwest Research Institute®, 6220 Culebra Road, San Antonio, Texas 78238-5166; USA
- 7 \* Corresponding author. Fax: +1 210 522 5155
- 8 E-mail address: dferrill@swri.org (D.A. Ferrill)
- 9 Keywords: Mechanical stratigraphy, normal fault, refraction, dilation, slip tendency, friction,
- 10 fault tip, monocline.

11

#### 12 ABSTRACT

Mechanical stratigraphy encompasses the mechanical properties, thicknesses, and interface 13 properties of rock units. Although mechanical stratigraphy often relates directly to 14 lithostratigraphy, lithologic description alone does not adequately describe mechanical behavior. 15 Analyses of normal faults with displacements of millimeters to 10's of kilometers in 16 mechanically layered rocks reveal that mechanical stratigraphy influences nucleation, failure 17 mode, fault geometry, displacement gradient, displacement distribution, fault core and damage 18 zone characteristics, and fault zone deformation processes. The relationship between normal 19 faulting and mechanical stratigraphy can be used either to predict structural style using 20 knowledge of mechanical stratigraphy, or conversely to interpret mechanical stratigraphy based 21 on characterization of the structural style. This review paper explores a range of mechanical 22 stratigraphic controls on normal faulting illustrated by natural and modeled examples. 23

24

#### Download English Version:

# https://daneshyari.com/en/article/5786390

Download Persian Version:

https://daneshyari.com/article/5786390

<u>Daneshyari.com</u>