1. INTRODUCTION

High-resolution Digital Elevation Models (DEMs) from LiDAR data (a.k.a. ALSM) across broad geographic regions offer the opportunity to perform landform correlations of fault scarps, and marine, lacustrine and fluvial shorelines by profile-based morphologic dating (linear and non-linear diffusion).

2. CLASSIC MORPHOLOGIC DATING STUDIES REVISTED

Hanks et al., 1984 - Profile modeling of the Santa Cruz, CA marine terrace risers:

- Using the topographic profiles published in Hanks et al., 1984, we recreate the Santa Cruz terrace to test our methodology and demonstrate the technique's utility for morphologic dating of marine terrace risers.

Hanks and Wallace, 1984 - Morphological analysis of Lake Lahontan shoreline scarps:

- From topographic profiles of Lake Lahontan high stand shorelines published in Hanks and Wallace, 1985, we revisit their quantitative comparison of profiles to demonstrate how morphologic dating can be used to correlate landforms.

3. APPLICATION OF MORPHOLOGIC DATING TO LiDAR/ALSM DATA

In this analysis, we similarly apply the morphologic dating technique discussed in sections 1 & 2 (at left) to fault scarps cutting the Sheep Creek affect area. Topographic profiles were extracted from the ALSM data and then analyzed for morphologic age.

4. CONCLUSIONS

Application of morphologic dating techniques to LiDAR/ALSM datasets offers an opportunity to correlate landforms over broad geographic regions.

The study demonstrates that differerate analysis can be applied to morlorphic dating analysis to a high degree of certainty. This approach may be especially appropriate for the Low-Relief environment of fault scarps, but also in other coastal environments.

Complications in the morpohologic age analysis can be traced to these causes: landform rejuvenation, non-transport limited conditions, non-linear diffusion, and non-diffusive conditions.

High-frequency noise in the LiDAR data affects profiles along the profile. Understanding the DEM for the steps calculation helps with this problem.

Further statistical analysis of the profile data will quantify correlation and help to resolve some of the complications that LiDAR data introduces to morphologic analysis.