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December 12, 2001
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U.S. Nuclear Regulatory Commission
ATTN: Mrs. Deborah A. DeMarco
Office of Nuclear Material Safety and Safeguards
TWFN Mail Stop 8 A23
Washington, DC 20555

Subject: American Geophysical Union (AGU) Poster Presentation

Dear Mrs. DeMarco:

Attached is a poster for presentation at the AGU fall meeting to be held December 10–14, 2001, in San Francisco, California. The title of this poster is:

> "Detachment Faulting in the Western Basin and Range: New Geometric, Thermal, and Temporal Constraints from the Bare Mountain Region in Southwestern Nevada" by D. Ferrill, J. Stamatakos, A. Morris, R. Donelick, A. Blythe, and D. Waiting

This poster is a product of the Center for Nuclear Waste Regulatory Analyses and does not necessarily reflect the view(s) or regulatory position of the U.S. Nuclear Regulatory Commission. If you have any questions, please contact Dr. David Ferrill at 210-522-6082 or me at 210-522-5252.

Sincerely,

Budhi Sagar
Technical Director

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Attachment

cc: J. Linehan, W. Reamer, B. Leslie, E. Whitt, B. Meehan, J. Greeves, J. Piccone, S. Wastler, K. Stablein, D. Brooks, T. Essig, P. Justus, W. Patrick, CNWRA Dirs/EMs, D. Ferrill, J. Stamatakos, D. Waiting, T. Nagy, A. Morris, R. Donelick, A. Blythe

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DETACHMENT FAULTING IN THE WESTERN BASIN AND RANGE: NEW GEOMETRIC, THERMAL, AND TEMPORAL CONSTRAINTS FROM THE BARE MOUNTAIN REGION IN SOUTHWESTERN NEVADA

T51B-0879

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We use zircon and apatite fission-track thermochronology to study distribution and timing of tectonic exhumation in SW Nevada and Eastern California in the context of regional detachment faulting.

69 new cooling ages from 50 samples, analyzed in conjunction with published fission track data (Holm and Dokka, 1991, 1993; Hoisch and Simpson, 1993; Hoisch et al. 1997), indicate distinct young (Miocene) and older (pre-Miocene) populations of fission track ages.

Widespread Miocene aged extensional faulting in the region is well-documented.

We interpret the area of Miocene cooling ages to be the exhumed footwall of a regional detachment system.

Active trailing edge of the hanging wall of this system is the Death Valley - Furnace Creek fault system.

Migration rates of the cooling front in the footwall of this system range from 4.0 mm/yr at the latitude of Bare Mountain to 7.3 mm/yr at the latitude of central Death Valley.

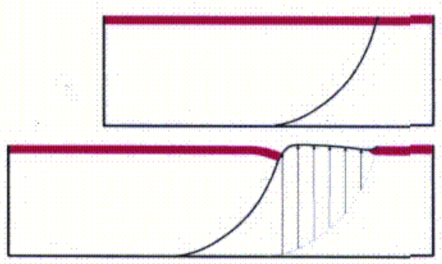
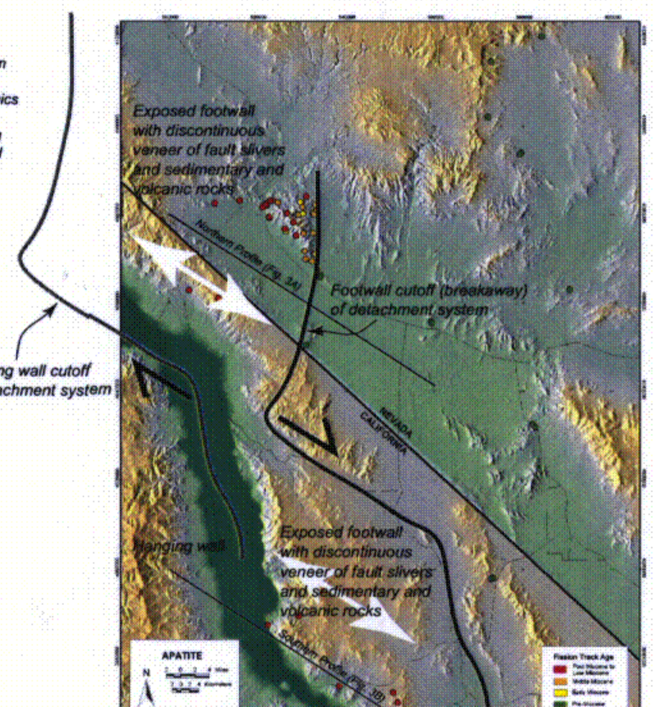


Figure 1. Model for exhumation and isostatic uplift of detachment system footwall (after Wernicke and Axen, 1988).

Figure 2. Interpreted position of detachment system footwall cutoff (breakaway) based on distribution of fission track ages. Inferred hanging wall cutoff mimics shape of footwall cutoff, and is located based on regional geologic and kinematic data, and youngling directions of apatite fission track ages. Background is color-shaded digital elevation model.



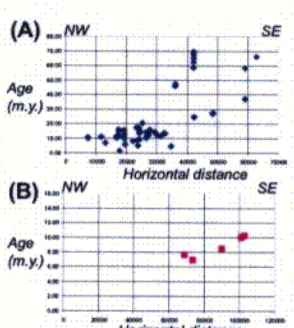
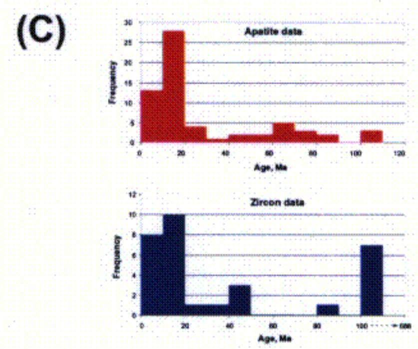
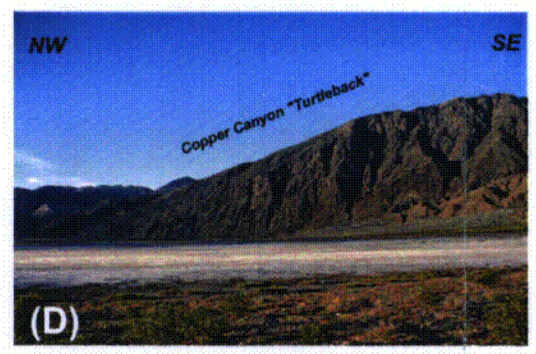
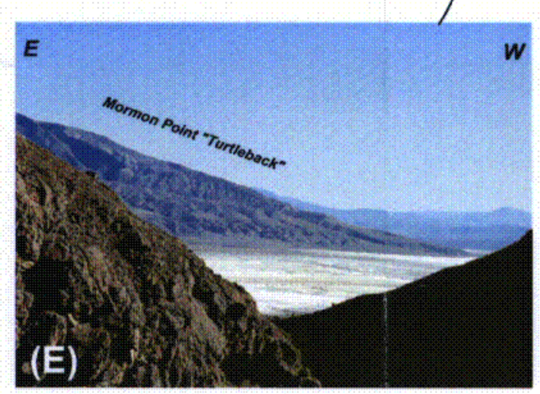


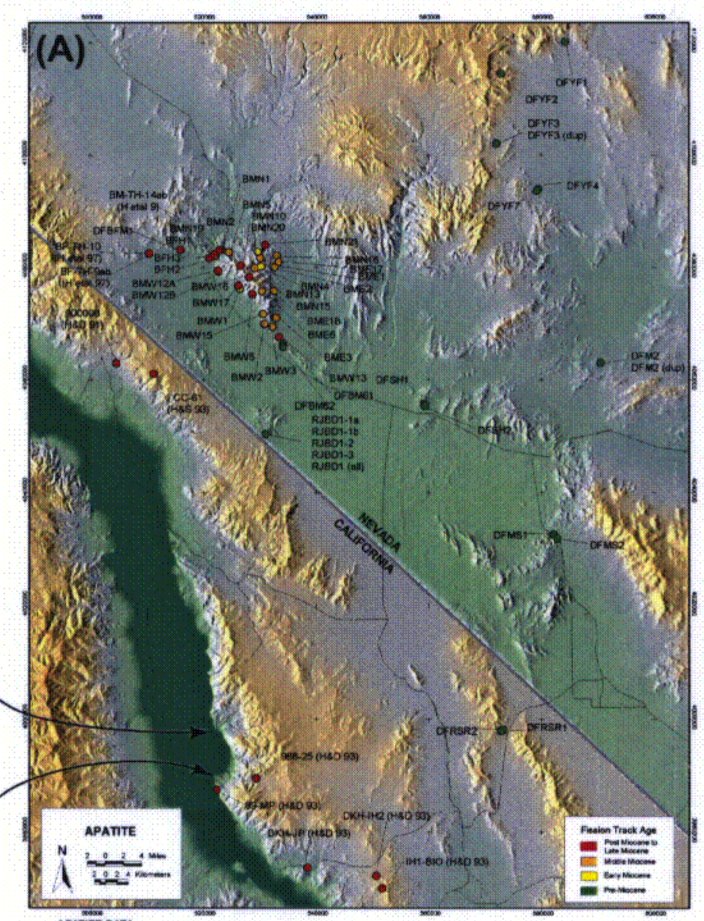
Figure 3. Apatite fission track age profiles along (A) Northern profile and (B) Southern Profile.

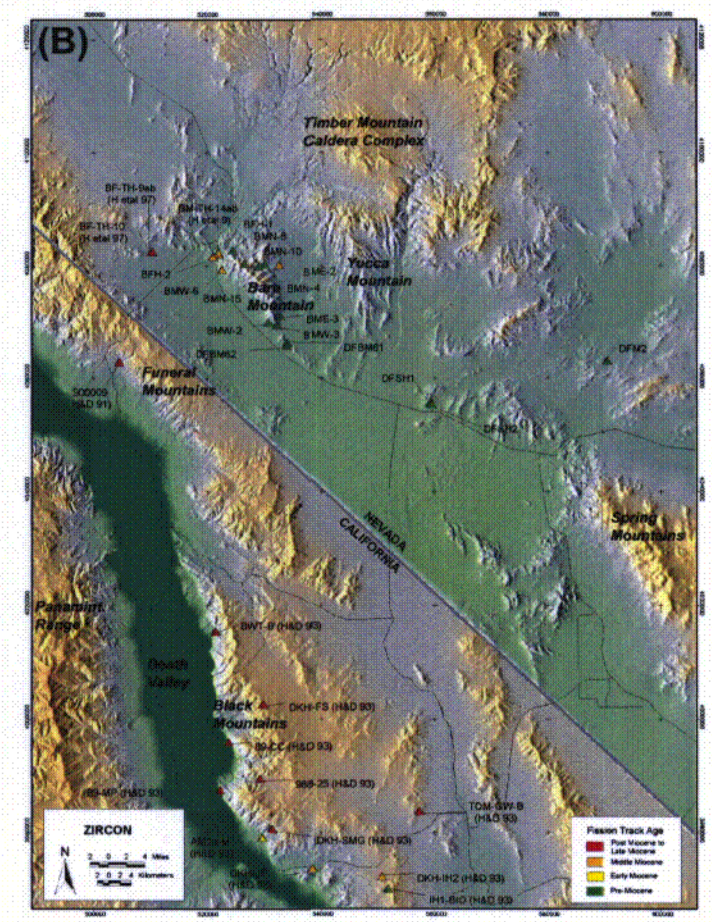
Figure 4. Maps of (A) apatite fission track ages and (B) zircon fission track ages from Bare Mountain, Nevada, and the surrounding region. Background is color-shaded digital elevation model. Sample locations are color coded according to ages as indicated in legend. Closure temperature for fluorine-rich apatite is 115-125 °C, and for zircon is approximately 250 °C. (C) Histograms illustrate frequency distribution of apatite and zircon fission track ages. (D) Field photograph of Copper Canyon "Turtleback" as seen from Death Valley looking to the northeast. (E) Field photograph of Mormon Point "Turtleback" as seen from Copper Canyon "Turtleback" to the north. These "turtlebacks" are corrugations of the central Death Valley fault which marks the edge of the active detachment fault system.











APATITE DATA

[illegible]

ZIRCON DATA

[illegible]

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Acknowledgments:

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