...display Quaternary fault ruptures that are as much as 10 km in length; ...appear to be interconnected along strike and probably at depth. Two faults ...ide of the mountain, the Paintbrush Canyon and Bow Ridge faults, display ...fault ruptures less than 3 km in length. The 4.3-km-long, Quaternary ...the Stagecoach Road fault may be a continuation of either the Paintbrush ...or an eastern splay of the Solitario Canyon fault. Trench studies across ...ults are planned to define the timing of past events, amount, and ...slip along faults. This data is critical for defining fault segmentation and ...currence models at Yucca Mountain.

Grant, John A.

...ION OF THE RIO CUARTO CRATERS, ARGENTINA.
...T, John A. and SCHULTZ, Peter H., Geological Sciences, Box 1846, Brown ...Univ., Providence, RI 02912.
...rio Craters in Argentina (64°15'W, 32°45'S) form ten oblong and rimmed ...at are oriented NNE–SSW. As reported elsewhere, considerable geochemical ...icates that crater formation occurred during a low angle impact from north to ...sultant craters are up to 4.5 km long, but decrease in size southward over a ~30 ...Each crater has an aspect ratio of 4:1, is <10 m deep, and has maximum rim ...downrange end. Present expression of the Rio Cuarto features is confined to the ...d Pampean Formation (modal grain size 0.0625 mm), a pedocomplex capped ...5 m of late Holocene sediment that superposes a truncated hypsithermal aged ...tcrop of this paleosoil in some craters implies the craters formed <3.5–5.0 ka. ...processes dominate degradation at Rio Cuarto and are the result of prevailing ...presently are nearly parallel to the long axis of the craters. Sediment stripped ...auses oversteepening, backwasting, and crater widening. Most deflated sediment ...d downrange and redeposited in longitudinal and more distal transverse dunes; ...me is transported laterally and creates dunes on crater side rims and flanks. ...al and groundwater processes contribute less to overall denudation as indicated ...densities in and around the craters of ~0.4–2.5 km/km² and 0.3–0.5 km/km², ...and the absence of gullies at wall seeps. Low surface gradients and moderate ...nductivity in the loess (0.3–3.0 m/day) allows infiltration of most precipitation ...runoff. A majority of precipitation entering the subsurface is either re–evaporated ...ds to a regional water table below the level of the crater floors.
...predominantly eolian degradation of the Rio Cuarto features contrasts with the ...ortant role of fluvial denudation at Meteor Crater, Arizona. In contrast to Rio ...thic ejecta fragments at Meteor Crater form a surface armoring lag following muni- ...on. As a result, degradation is more rapid at Rio Cuarto and indicates that signa- ...w angle impacts into surficial deposits are geologically transient relative to those ...with more common, higher angle impacts.

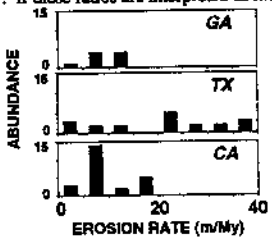
Roessner, S.

...L ELEVATION MODELS AND QUANTIFICATION OF LONGTERM ...ATION RATES IN THE CENTRAL KENYA RIFT (CKR).
...ROESSNER, S., STRECKER, M.R., Dept. of Photogrammetry and Remote Sensing, P.O. Box 6980, 76128 Karlsruhe, Germany; FIELDING, E. J., Institute for the Study of the Continents, Snee Hall, Cornell University, Ithaca, NY 14850.
...mination of denudation rates over geological time spans based on recent ...ments is difficult due to high temporal variability and major environmental changes ...by recent human land use. The derivation of denudation rates through temporal ...in topography is one way to avoid this lack of longterm process information. ...Based on well established stratigraphy, faulting chronology and recent digital topo- ...the Naivasha Sedimentary Basin in the CKR is an ideal site to assess longterm ...pe evolution in a rift environment for the last 3.4 Ma. The existing database allows ...ify the volume of material removed from the slopes of the eastern rift shoulder and ...rift Kinangop Plateau into the tectonically active inner graben of this rift sector. ...nal remnants within the youngest volcanic units on the plateau and the rift flanks ...to decipher the character of the paleo-surface asssuming an idealized uneroded ...ctional relief prior to intrarift plateau formation. Digital topography and paleo- ...phy of the 2000 square km study area is derived from recent contours and relic ...points, respectively. Both surfaces are created by interpolating 120 m-spaced grids ...angular irregular networks.
...Based on calculation of elevation differences between the two surfaces at each grid ...the average overall denudation rate amounts to 11 m/Ma. For about 80% of the area ...udation rate ranges between >0 and <30 m/Ma. However, digital topography ...ing continuous surface information allows a regional differentiation of denudation and ...fication of relationships between tectonic relief and denudation.

...4 Bierman, Paul R.

...SION RATE AND EXPOSURE AGE OF GRANITE LANDFORMS ...IMATED WITH COSMOGENIC ^{36}Cl
...IERMAN, Paul R., MASSEY, Christine. A., GILLESPIE, Alan R., Department of Geology, University of Washington, Seattle, WA 98195; ELMORE, David, PRIME Lab, Purdue University, W. Lafayette, IN 47907; CAFFEE, Marc, Lawrence Livermore National Lab, Livermore, CA 94550
...e landforms, such as bornhardts and inselbergs appear to be stable portions of ...dscape. To quantify this observation, we analyzed ^{36}Cl in 57 samples collected ...exposed bedrock and saprolite surfaces in the Piedmont of north-central Georgia, the Llano uplift (central Texas), and the Alabama Hills (southeastern CA). We developed and used a method for extracting ^{36}Cl from granitic rocks which does not require the use of HF and which isolates the $^{35}Cl(n,\gamma)^{36}Cl$ production pathway. Using this method, ratio measurements can be interpreted directly without quantifying the abundance of Cl.

Our AMS measurements of ^{36}Cl indicate that many granitic surfaces have received significant doses of cosmic radiation and are exceptionally stable features on the landscape. Ratios of $^{36}Cl/Cl$, measured on samples collected from exposed bedrock surfaces vary from 79 to 2340 x 10^{-15}. If these ratios are interpreted as model exposure ages (implying no erosion), the range of ages is 34 ka to > 1 Ma. If ratios are interpreted as steady-state erosion rates, using a finite-difference model and a depth - ^{36}Cl production function calculated from literature values, model erosion rates vary from 1.6 to 80 m/My. The median model erosion rates for the three sites are similar: TX =10 m/My (n=27); CA = 8 m/My (n=22); and GA 6 m/My (n=8). The lowest model erosion rate was measured at the top of Enchanted Rock (1.6 m/My).



BTH 5 Madole, Richard F.

GEOMORPHIC AND STRATIGRAPHIC DATA FOR DETERMINING MASS-MOVEMENT CHRONOLOGIES AND LANDSLIDE RECURRENCE INTERVALS.
MADOLE, Richard F., U.S. Geological Survey, Box 25046, Federal Center, MS 966, Denver, CO 80225.

Progress in dating landslide deposits and reconstructing mass–movement chronologies lags far behind similar work on glacial, fluvial, and eolian deposits. A generally meager amount of chronologic data makes it difficult to assess the influence of climate and earthquakes on landsliding and hinders determination of landslide recurrence intervals.

Studies of landslides have revealed three kinds of geomorphic and stratigraphic evidence that record recurrent movement: (1) translocated pond deposits, (2) flank–ridge deposits, and (3) landslide–dammed lake and stream deposits. These deposits commonly contain or bury materials suitable for radiocarbon dating.

Sequences of pond deposits develop on landslides when the locations of ponds remain fixed from one movement to the next, while the deposits that accumulated in the ponds are translocated downslope. Repetitive slope movements give rise to a series of pond deposits that collectively record the number and magnitude of recurring slope movements.

Depositional flank ridges resemble small lateral moraines. They consist of landslide material that is deposited on ground adjacent to the slide path in locations where the landslide is not constrained laterally. They are most common where topography adjacent to the landslide is lower than the landslide surface or the slide path narrows and the moving mass thickens enough to overflow laterally.

Many landslides reach valley floors where they dam streams and induce sedimentation in lakes and ponds or cause localized alluviation by altering stream channel form, gradient, and sediment supply. Landslide deposits commonly cause knickpoints on valley long profiles and give rise to relatively wide, flat alluvial reaches on the upstream side of the landslide deposit.

Of the three data sources, translocated pond deposits can provide the most detailed slope–movement histories, provided that slope is low. In places where the failure surface steepens, extending flow may cause widespread fragmentation of deposits, making it difficult to reconstruct the pond sequence. Soil studies are particularly useful in identifying and estimating the ages of translocated pond deposits.

BTH 6 Cenderelli, Daniel A.

SEDIMENT PRODUCTION, TRANSPORT, AND DEPOSITION IN FOUR DEBRIS-FLOW CHANNELS ON NORTH FORK MOUNTAIN, EASTERN WEST VIRGINIA
CENDERELLI, Daniel A., and KITE, J. Steven, Dept. of Geology and Geography, West Virginia University, Morgantown, WV 26506

Catastrophic rainfalls in 1949 and 1985 have initiated fifteen large debris flows in steep basins on North Fork Mountain. Detailed mapping (1:1200 and 1:1600 scale) of four debris-flow impacted basins, two from each rainfall event, shows a consistent spatial distribution of erosional and depositional features associated with these debris flows.

Each debris flow can be divided into an upper failure zone, a middle transport zone, and a lower deposition zone. The failure zone is broad and shallow with depths less than one meter. Failures were initiated in colluvium or along colluvium/bedrock interfaces in hillslope hollows. The transport zone is transitional and exhibits both erosional and depositional features. This zone is characterized by deeply cut channels, scoured channel slopes, spill-over chutes, and debris levees. The deposition zone consists of multiple steep-fronted lobes and terraces comprised of clast-supported cobbles and boulders with minor amounts of fines. Deposits in the deposition zone have been modified by hyperconcentrated flow or flood streamflow.

Preliminary estimates show the volume of sediment removed from the failure zone is significantly less than the volume of sediment deposited in the deposition zone. Volume differences between the failure and deposition zones, combined with erosional features in the transport zone indicate the debris-flow mass is an effective erosive agent as it travels through the transport zone.

Evidence of older debris flows indicate debris flows have occurred repeatedly in these basins during the late Quaternary. Lichen growth on boulders, clast weathering, and soil development on older deposits suggest debris flows have recurrence intervals of hundreds or thousands of years.