

Title:

Army impacts on Desert Soils -- Comparing
Geologic Rates of Change to those
Occasioned by General George S. Patton

Author Name 1: P.R. Bierman

Author Name 2: K.K. Nichols

Author Name 3: E.M. Clapp

Author Name 4: M. Caffee

Evaluating environmental impacts in order to manage lands responsibly requires an understanding of natural rates of change as well as an understanding of the rates at which landscapes recover from human impacts. The Desert Training Center, a dozen former camps of General Patton, provides an opportunity to make such a comparison. Using high precision surveying along with measurement of rare isotopes formed by the bombardment of soil by cosmic rays, we constrain both post-Patton (55 yr) and geologic (1000 to 25,000 yr) rates of change.

At Camp Iron Mountain, surveys of 18 plots show significant differences in channel morphology between 6 six control plots outside the camp and 12 disturbed plots within the camp; channels in the camps are wider, deeper, and more frequent than those in less-disturbed areas. Road berms and compacted footpaths channel flow and are responsible for the observed differences. Leveling of berms and disking of roadways and footpaths at closure would speed landscape recovery.

Measurements of ^{10}Be and ^{26}Al allow us to constrain long-term rates of sediment movement across the camps. We find that the surfaces on which the camps were built are slowly aggrading at 15 to 40 mm/1000 yr. Grains of sediment move across the camps at 25 to 50 cm/yr. These data suggest it will take hundreds of years for the landscape to recover from Patton's tanks and troops.