A multi-scale approach to understanding desert piedmonts using cosmogenic isotopes and centimeter-scale surveying

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## Approach

<table>
<thead>
<tr>
<th></th>
<th>Short-term (50 yrs.) maps</th>
<th>Long-term ($10^3$ to $10^4$ yrs.) isotopes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Small-scale (m)</strong></td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td><strong>Large-scale (km)</strong></td>
<td>N/A</td>
<td>3</td>
</tr>
</tbody>
</table>
Global Positioning Systems (GPS; left)

Accelerator Mass Spectrometry (AMS; top)
Desert Training Center
1942 to 1944

- Over 1,000,000 men
- 12 base camps
- Size of Vermont
Why use Iron Mountain?

• 2 years channel alteration (Army tanks, marching soldiers, etc.)
• No significant disturbance since
• Discrete time-frame of channel response to intense use (1944 to present).
• Ability to survey channels on the centimeter scale using differential Global Positioning System.
Centimeter-scale topographic mapping

- 6 Control Plots - representative of piedmont channels outside of Camp Iron Mountain
- 6 Walkway Plots - representative of piedmont channels forming in areas of intense foot trafficked areas
- 6 Road Plots - representative of piedmont channels forming down-gradient of road berms
Control Area
Typical Walkway Area
Typical Road Area
Channel orientations

Control Plots

Walkway Plots

Road Plots