

Wall Mountain Tuff – The Puzzling Presence of the Colorado Rockies

Registration for this trip includes box lunch, water, snacks, transportation, and entrance fees

Leader: Lon Abbott, University of Colorado, Boulder

The Colorado Rockies first rose during the Laramide Orogeny, which is a most puzzling orogeny because it occurred far from an active plate boundary. But that's just the beginning of the head-scratching that ensues when one contemplates why the modern Rockies exist. The Laramide Orogeny didn't produce enough crustal shortening to support a mountain range as high as the one we see today. That theoretical argument is supported by the observation that the crust under the Rockies is no thicker than it is under the adjacent Great Plains. The so-called "rootless Rockies" must be supported by a different mechanism than the typical crustal root that buoys ranges like the Himalaya or Andes.

Furthermore, abundant evidence shows that soon after they rose, the Laramide Rockies were beveled by erosion and buried by a mixture of volcanic ash and their own debris. The mountains took their modern form within the last 5 million years thanks to a cycle of vigorous erosion that exhumed those buried Laramide crystalline block uplifts. But when it was that the mountains achieved their current height above sea level and what triggered the pulse of erosion during the last 5 million years, whether renewed tectonic uplift or global climate change, remain unsolved mysteries. On this field trip, we'll examine the geological evidence that demonstrates that the Laramide Orogeny didn't produce today's mountains and contemplate some of the clues that might someday help answer the questions of when and why the modern mountains rose.