Exhumation of the Gros Ventre Range and Implications for Laramide Tectonics and Hoback Basin Deposition, NW Wyoming

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ABSTRACT

Renewed interest in tectono-thermal evolution of the Laramide region has inspired studies that suggest a southward propagation of regional exhumation in the western United States. Analyzing exhumation, or the process of rock approaching earth's surface, and erosion rates using thermal signatures recorded in apatite has proven to be a useful tool in understanding the timing of deformation and landscape development in the Laramide region. Exhumation is controlled by both tectonic and surface (erosional) processes, thus understanding patterns of cooling ages, because rocks cool as they approach the surface in normal circumstances, may reveal regional trends in the propagation of exhumation that will give clues to test thermo-tectonic models. The Gros Ventre Range offers an opportunity to observe how exhumation varies across an approximately 100km transect spanning from the Wind River Range to the Teton Range, the highest and largest ranges in the Laramide region. Late Cretaceous-Paleogene or Miocene exhumation fit well with the tectonic history of the region, but thermo-tectonic relationships have not been recognized. Using apatite fission track thermochronology, this study will measure the timing of Gros Ventre exhumation and explore implications for regional-scale exhumation, structure and local landscape development.

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