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Paper No. 31-7

Presentation Time: 7:00 PM

UTILIZING APATITE (U-TH)/HE ANALYSES AND INVERSE THERMAL HISTORY MODELING TO CONSTRAIN THE UPLIFT HISTORY OF THE SOUTH-CENTRAL PART OF THE TETON FAULT

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The active Teton fault represents a major potential seismic hazard in the Intermountain Seismic Belt (ISB) of Wyoming. Although many recent studies have focused on establishing the Holocene slip history, the extent of both the paleo- and seismogenic Teton fault remains somewhat controversial. Because fault uplift and displacement studies can provide some insight into the length and extent of the fault, this study will use AHe data in conjunction with inverse thermal history (QTQt) models to provide new constraints on the uplift history of the Teton fault near Static Peak, which has not been previously examined using these techniques. The southern termination of the Teton fault has traditionally been proposed to occur at the intersection with the Laramide Cache Creek thrust. Contrary to this traditional interpretation, previous uplift studies have indicated that the fault may be much longer than traditionally interpreted, possibly placing the northern and southern terminations of the fault beyond their current estimates. Current cooling models indicate that the onset of Teton uplift began initially near Mount Moran at 12-20 Ma, with later uplift initiated at the Grand Teton and Rendezvous Peak areas at ~11 Ma and ~6 Ma, respectively, reflecting the progressive southern migration of Teton fault displacement. However, both the Grand and Rendezvous uplift models are based on a limited number of data points, and the Grand sampling transect steps back >7 km from the projected Teton fault plane, which may limit its applicability for constraining fault motion. A new transect from Static Peak, which is located between the Grand and Rendezvous transects, should refine the onset timing and total displacement estimates for the south-central part of the Teton fault. Future work will involve collection of additional transects near southernmost Rendezvous Peak, and near the interpreted intersection of the Cache Creek and Teton faults.

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Monday, 26 October 2020: 5:30 PM-8:00 PM

Geological Society of America *Abstracts with Programs*. Vol 52, No. 6
doi: 10.1130/abs/2020AM-358831

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