**Neogene faulting, basin development, and relief generation in the southern Klamath Mountains**

Michalak, Melanie J.\*1, Cashman, Susan M.1, Langenheim, Victoria, E.2, Team, Taylor C.1, Christensen, Dana, J.1

\*corresponding author, melanie.michalak@humboldt.edu

1California Polytechnic State University Humboldt, Arcata, CA

2United States Geological Survey, Moffett Field, CA

Supplemental files associated with this manuscript:

Figure S1: Effective Uranium (eU) vs. U-Th/He apatite cooling age

Figure S2: The two Miocene U-Pb detrital zircon ages from this study plotted on a Wetherill Concordia plot with uncertainties.

Figure S3: Weaverville and Lowden Ranch structure contour map

Table S1: HeFTy thermal modeling constraints, model inputs and outputs, data sources and references (separate Excel file)

Table S2: Detrital U-Pb zircon ages and data (separate Excel file)

Table S3: Detrital Lu-Hf zircon ratios (separate Excel file)

**Figure captions:**

Figure S1: Effective uranium (eU) vs. apatite U-Th/He cooling age for all individual grains in this study. Blue dots are from Canyon Creek, orange from Granite Peak, gray from Ironside Mountains and yellow from China Creek.

Figure S2: A Wetherill Concordia plot with the two Miocene U-Pb ages from the Lowden Ranch basin sample. Black solid line represents concordia between the Pb-206/U-238 and Pb-207/U-235 systems. Blue ellipses show 2 sigma uncertainties, and ages are labeled.

Figure S3: Structure contour map of the Weaverville and Lowden Ranch grabens, contours are in feet. Green dots represents wells in bedrock, yellow dots are wells that did not reach bedrock.

**References cited in Supplemental material:**

Flowers, R. M., Ketcham, R. A., Shuster, D. L., & Farley, K. A., 2009. Apatite (U-Th)/He thermochronometry using a radiation damage accumulation and annealing model. Geochimica et Cosmochimica Acta, v.73(8), 2347–2365. https://doi.org/10.1016/j.gca.2009.01.015

Ketcham, R.A., Gautheron, C. and Tassan-Got, L., 2011. Accounting for long alpha-particle stopping distances in (U–Th–Sm)/He geochronology: Refinement of the baseline case. *Geochimica et Cosmochimica Acta*, *75*(24), pp.7779-7791. <https://doi.org/10.1016/j.gca.2011.10.011>