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Supplemental Material

Table S1. Data for full topographic profile up Table Mountain and McKenzie Table Sections highlighted in red show significant erosion.

Methodology for Meander-Tilt Analysis

In order to fully characterize the surface, we obtained UTM coordinates and elevations for the centerlines of the two Tables using the USGS NED1 30-m digital elevation model, following the least-eroded portions of the mesa tops (Figure 6A). A total of 767 data points were taken (Supplemental Material). The data from the ends of the mesas, which were eroded, were removed. The north-facing ends of the flow, truncated by erosion of the San Joaquin River canyon, are transversely fractured due to progressive slumping into the canyon and were excluded. The flow surface itself, however, has obviously been at least somewhat eroded in many places during 9.3 Ma of exposure. Inasmuch as the elevation gradient is the first derivative of the topographic profile, it is quite sensitive to erosion. We therefore fitted the topographic profile data with polynomial functions (Figure 6A).

We fitted all of the Table Mountain points to a single third-order equation

$$E = -1.1127 \times 10^{-9}L^3 + 6.421 \times 10^{-6}L^2 + 1.170 \times 10^{-2}L + 446.7$$

where E is elevation in meters and L is distance along the profile in meters. However, the higher-order polynomials deviated from the actual topography at the ends of the McKenzie Table profile due to lack of sufficient constraints at the ends. This is a common problem with polynomial fitting. We therefore replaced them with short segments of lower-order polynomial regression that fitted the data well. For the first four points on McKenzie Table we used

$$E = 6.325 \times 10^{-9}L^3 - 1.290 \times 10^{-4}L^2 + 0.8812L - 1466$$

and for the last three points we used

$$E = -7.039 \times 10^{-6}L^2 + 0.1525L - 226.15$$

The remainder of the points were fitted with the equation

$$E = 7.770 \times 10^{-13}L^4 - 2.790 \times 10^{-8}L^3 + 3.704 \times 10^{-4}L^2 - 2.140L + 5085$$

The topographic gradient was then calculated using points separated by three intervening points, in order to damp any noise due to truncation errors in the regression equations.

The combined polynomial fits are shown in Fig. 6A. The gradient as a function of meander azimuth is shown in Figure 6B. The uncertainty bars on the data points (0.15°) represent one standard deviation of the differences between the cosine curve and the data.