NEW COSMOGENIC $^{10}$BE AND $^{26}$AL MEASUREMENTS OF GLACIATED SURFACES, SIERRA NEVADA, CALIFORNIA - THEY'RE PRECISE BUT ARE THEY ACCURATE?

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We measured $^{10}$Be and $^{26}$Al in samples of granitic boulders and bedrock exposed on and adjacent to late-glacial moraines that correspond to the Recess Peak advance in a high cirque of Middle Fork Bishop Creek, Sierra Nevada, California. Two samples from polished bedrock inside the innermost moraine and one sample each from large (>2 m) unweathered boulders on the crests of right and left lateral moraines are indistinguishable within the analytic precision (~5%) for both isotopes. One sample from polished bedrock ~50 m outside the moraine, last occupied by Tioga (glacial maximum) ice, has substantially higher concentrations of both isotopes.

The mean isotopic concentrations in the four Recess Peak samples is $5.03 \times 10^5 \pm 7.75 \times 10^3$ atoms/g ($^{10}$Be) and $3.20 \times 10^6 \pm 2.11 \times 10^5$ atoms/g ($^{26}$Al); the standard errors of the means are thus ~1 and 3%, respectively. The sample outside the moraines has concentrations of $6.67 \times 10^5 \pm 2.84 \times 10^4$ atoms/g ($^{10}$Be) and $4.06 \times 10^6 \pm 2.37 \times 10^5$ atoms/g ($^{26}$Al).

Applying the production rates of Niishizumi *et al.* (1989) yields mean ages of $8760 \pm 460$ $^{10}$Be yr B.P. and $8920 \pm 670$ $^{26}$Al yr B.P. for the four Recess Peak samples. However, AMS radiocarbon dates from lake sediments inside the moraines demonstrate that the Recess Peak glacier disappeared before ~13,100 cal yr B.P. (~11,200 $^{14}$C yr B.P.).

There are several possible explanations for the large discrepancy in ages: (1) the radiocarbon ages from the lake sediments are thousands of years too old; (2) thick winter and spring snow cover has attenuated the cosmic ray flux; or (3) current production rates for $^{10}$Be and $^{26}$Al are too high, by as much as 50%. The first explanation is unlikely because many other dates from higher in the sediments, and from other similar lakes, indicate the radiocarbon dates are accurate. The second explanation is feasible, but it seems unlikely that samples from four disparate sites would all be effected to the same degree. The third explanation is at odds with other recent calibrations that indicate the production rates of Niishizumi *et al.* (1989) are within ~10-30% of the actual values.

The significantly greater isotopic concentrations in the Tioga sample suggest that several thousand years separated Tioga deglaciation and the Recess Peak advance. The lower concentrations inside the moraine indicate that even small, brief advances such as the Recess Peak can erode enough bedrock to "reset" the cosmogenic clock.