

Nichols, Kyle K., et.al., 2002, Revisiting the age of the Blackhawk: Landslide dating using ^{10}Be and ^{26}Al . For submission to California Geology.

Previous attempts to date the Blackhawk landslide located on the northern flank of the San Bernardino Mountains in the Mojave desert, CA, vary greatly due to “dead” carbon incorporated into gastropod shells that were carbon dated and the lack of knowledge of exposure and erosion history of the sampled debris. This study facilitates cosmogenic nuclides ^{26}Al and ^{10}Be and geomorphic relationships in a further attempt to constrain the prehistoric age of the landslide. Exposure ages from five boulders located on levees, the side slope, and the toe of the slide yield a date of approximately 30 to 35 k.y.b.p. Although ages determined by this study narrow the range significantly, the interpretations of CNR concentration are riddled with complexities associated with erosion of boulders since landslide deposition, potential burial and, nuclide inheritance prior to landsliding.

As stated by Kyle himself, this paper is in rough draft form and needs several edits for just grammar etc. Overall, I find the organization of the paper to be quite good. The figures (mostly pictures) are informative and appropriate. Figure 6 (topographic profiles of levees) needs to be cleaned up and better explained I think. The caption for Figure 5 (boulder sample sites) refers to the boulders as granitic where as is the text they are referred to as gneissic...keep the consistent. My major problems with this paper are as follows: 1) There needs to be more background relating to several issues I will discuss below, 2) The logic behind several interpretations and conclusions is confusing, and at times contradictory to previous statements in the paper, 3) You need to write up your conclusions and, 4) Reword some things for the ‘layperson’ or ‘laygeologist.’

At this point in the game, I would not recommend this piece for publication. Although the subject matter and methodology are sound, the interpretation and conclusion sections are jumbled and confusing. Further recommendations for publication will depend on restructuring of interpretations and conclusions drawn from them. I think it would be beneficial to all to state up front what is your knowledge to date concerning the origin of the landslide material. Are we to assume that the boulders studied were exhumed and exposed for the very first time from the bedrock of Blackhawk Mountain during the landslide. I believe that this is the assumption, but it is never stated at the beginning. It is of course uncertain, but it may help people to understand the complexities discussed later if they have that assumption clearly stated in the introduction. Regarding your use of the quartz from the sandstone boulder; wouldn’t the sand reflect previous periods of accumulation simply by being a sedimentary rock? (i.e.- Erosion, periods of transportation, storage and, final deposition prior to lithification

would all result in at least some CNR accumulation I would think). I was wondering if the side-slope boulder was at all shielded by the slope itself?

Specific comments keyed to numbers in manuscript:

- 1) Need to state that fossils indicate the presence of standing water.
- 2) Further on #1. If this is to the 'layperson,' maybe you should put the pond in context. If the pond is younger than the slide, it is not clear to me how the shells became incorporated in the debris of the landslide? Did Stout et.al. know this at the time of their study? Also, there is no way to tell exactly how much younger the lake deposits are relative to the landslide.
- 3) Units
- 4) Reword; flow of logic.
- 5) Where shielding measurements collected? If shielding was not an issue because the boulders were completely exposed (which probably was the case) state that.
- 6) State that these were cross-cutting profiles.
- 7) Explanation: what does $^{26}\text{Al}/^{10}\text{Be}$ ratio indicate and why.
- 8) Explanation: simple explanation of chemical weathering.
- 9) Where on table 1 is this given as the age for BH-7 (side slope boulder)?
- 10) Reword so the second sentence is clearly evidence supporting the first.
- 11) Expand on this method.
- 12) You give the probably age as somewhere between the side slope and the toe boulders. I agree that the levee boulders are probably way off due to burial for some amount of time. But from all of the discussion previous to this statement, I would argue that the side slope and toe boulders probably contain some amount of inheritance and thus reflect an older age than the slide itself. As stated above, I would think the sandstone boulder would reflect some amount of inheritance just from being composed of sedimentary rock.
- 13) As discussed earlier in your text, the side slope boulder potentially reflects some inheritance thus yielding an older age. Here you say the opposite. I understand the complexities, but am wondering if this will come off as bit confusing and contradictory.
- 14) Figure 5 caption. Change from granitic to gneissis.
- 15) Seems as though you are missing some data. $^{26}\text{Al}/^{10}\text{Be}$ ratio deviations and data for BH-7