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Interactive comment on “Native American lithic procurement along the international border in the boot heel region of southwestern New Mexico” by K. E. Zeigler et al.

Anonymous Referee #2

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Review of se-2010-17 NATIVE AMERICAN LITHIC PROCUREMENT ALONG THE INTERNATIONAL BORDER IN THE BOOT HEEL REGION OF SOUTHWESTERN NEW MEXICO by K.E. Zeigler et al.

This is an interesting, although limited, study of lithic procurement by native Americans in the American southwest. It is a fairly opportunistic study, providing some of the first data of this sort in this region by taking advantage of data collected during geological and anthropological surveys conducted in preparation for the construction of a wall along the US-Mexican border.

I have several main concerns with this manuscript. The first is that the figures need

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some of work (and a few addition figures, as described in the comments below, might be useful). The second is that by virtue of being fairly low tech and opportunistic, the design of the study is not what it could have been. The authors do briefly discuss this, but I think that there are a few other things that could be said about the limitations of the study and the extent of the possible impacts on the results (see specific comments). Lastly, even the somewhat uncertain conclusions aren't terribly interesting. But perhaps the fault here lies with the presentation; perhaps the results concerning procurement of the materials could be put into better archaeological or cultural context than it has been.

Specific Comments

1) I had a lot of problem with the maps and I think there are changes that could be made to make them more useful to someone reading the paper.

First- sometimes Figs 4-6 are referred to instead of Figs 3-5. That needs to be fixed.

Second- I had a little bit of trouble relating Fig 1 to Figs 2-5 since the areas discussed are such a small part of the map shown in Fig 1. Is there a reason for Fig 1 to cover so much larger an area?

Third- On Fig 1, I couldn't at first figure out where the Sierra Fresnal obsidian source was supposed to be since I was looking for was a small white square on a field of white and what I should have been looking for were two white squares with "1st" and "2nd" in them. Further confusing things is that the other sources are given as shaded squares in the legend but as ovals or circles on the map, which is also covered with similarly sized white circles that are not sources at all, but cities.

Fourth- The manuscript seems to have been written by someone very excited about geology, but less excited about the anthropological results. I think the paper could be helped greatly by an inclusion of the "anthropological" data in graphic form. For example, pie charts of percentage of the materials making up the assemblages at the

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different sites in different times would be a lot easier to take in than the data table (although it is good that the data table is there).

Fifth- And since the paper relies entirely on visual identification of the materials in various artifacts, much confidence in the success of this approach would be gained if one or two examples were pictured. This is especially true for the materials identified in "high resolution" photographs instead of from direct inspection of specimens. Also, this manuscript has been submitted to a geology journal and not to an archaeological journal; some pictures of artifacts would be useful for the non-archaeologist readers to get a better idea of the study as it was carried out.

2) On pages 5 & 6, the authors refer to radiocarbon dates obtained from "thermal features". They need to explain what they mean by this.

3) Section 2.3- Discussion of the site cluster localities would be improved by citing specific figures from time to time.

4) On p 7, the authors refer to "aerially associated sites". This term also needs to be explained.

5) On p 11, the authors say that, "No biotite was identified in hand sample." Did they mean "hand samples"?

6) Ditto with "in photograph" (in photographs?) on p 13.

7) Section 4, describing the local geology, could also be improved with at least a couple of citations to specific figures.

8) p 19 and in other places- was "AFT" defined at some point?

9) There is a grammatical hiccup on p 21: "...fossils have been replaced chert."

10) p 27- AMD was defined in the methods section, but by page 27, I've totally forgotten what it stands for. Could it be redefined here?

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11) p27, p31- Given the uncertain nature of the data used in the calculation of AMD, is it really fair to report so many significant figures on the AMDs? (e.g. 4.00 and 1.73 km)

12) It would be nice to have the AMD data presented together in a table. It is the ultimate point of the manuscript, after all, and should be easily accessible.

13) p31- The authors state that the postulated closer source of obsidian would have significantly lowered the AMDs of the Protohistoric assemblage. By how much?! Could the authors give an example like, "if the source were, for example, located at such and such a spot, the AMDs would decline to..., whereas if they were at this other spot, the values would drop to AMD". Just something, anyways, to put the possible decrease in perspective.

14) A couple of times (e.g., on page 35), the authors present a difference as insignificant and then discuss its "meaning" anyways. I'm somewhat uncomfortable with this, as what is the point of testing for significance if insignificance isn't going to stop speculation?

15) On page 34 and in the Summary and Discussion, the authors briefly note some of the weaknesses of the study. It is good that they did this, but I think they should have gone somewhat further with this. I would like to know, for example, how the very obvious lack of data from south of the US-Mexican border could affect the results. I think this is particularly a problem as the study focused on sites that occurred directly along the border, a totally arbitrary set of sites that arises due to the data that became available related to surveying for the border fence. Thus the sites fall along a line that on one side is well documented in terms of possible sources of materials for artifacts and on the other side is basically a big black unknown. This needs to be better discussed.

16) Can a little bit more be said in terms of what procurement entailed and why anyone bothered to procure specific materials when, as the authors point on, there were probably rocks lying around all over the place? Did the native Americans carry things by hand? Did they have sacks or means of hauling things? How much could they carry

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in one go? What kind of distance was far for them for carrying rocks? Some of this stuff must be known. How do the AMDs compare to what has been seen from other studies, if not nearby, than at least in similar environments. Also, did the natives have access to pack animals of any sort, especially during the protohistoric period? What about trade? Sorry if these are dumb questions- I am not an archaeologist, but I found myself wanting to know the answers to them. Also, what was so great about obsidian that they might have been willing to schlep it so far? I can guess, but I'd rather it be explained by the experts.

17) Maybe this last one is totally off the topic, but it is nagging at me a bit. Is there a moral dimension to be discussed, if only very briefly? These are data collected as part of the construction of a highly contentious physical barrier along the US-Mexican border. I, for one, would not have wanted to be one of the geologists conducting the survey for something like this. If this were the Berlin Wall, we would be up in arms. I won't insist on a brief discussion of this, but as a reader I'd be curious about the opinion of authors about their contribution to this endeavor as, obviously, some of them must have been the geologists contracted to do the survey along this stretch of border.

Interactive comment on Solid Earth Discuss., 2, 331, 2010.

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