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Reply on RC1

Kevin H. Mahan et al.

Author comment on "Virtual mapping and analytical data integration: A teaching module using Precambrian crystalline basement in Colorado's Front Range (USA)" by Kevin H. Mahan et al., Geosci. Commun. Discuss., <https://doi.org/10.5194/gc-2021-9-AC1>, 2021

6/16/21

Online discussion response to Reviewer 1 comments

Thank you very much, Reviewer 1, for your helpful comments! We offer responses to the main comments below.

Reviewer 1 appears to have two main concerns in their general comments. The first is that we did not include response data from our pre- and post-course questionnaires. While it is true that we have ran this module twice now (July 2020 and Spring 2021) and we used the questionnaires in both courses, we cannot legally publish the results because we were not certified by CU's Institutional Review Board to conduct research on human subjects. However, we will look for ways to share more generalized insight from these responses and will plan to include this in our revised manuscript. One item that is already shared in the current manuscript is how much the students valued the "drop-in" meetings with individual mapping partners. Another point that we can make in the revised manuscript, a sort of "lesson learned", is that we did not use the current version of the "Station description request and justification" form in our first running of the module – specifically, the prompts for hypothesis-testing were added in between our two courses. We found that the students needed to be held more specifically accountable for justifying why they wanted to "map" in a particular area on each successive day. The modified, and now current, version of this forms addresses this initial shortcoming. Another point that we can make in this context, and this also addresses a later question by the reviewer, is that we do intend to incorporate aspects of the dataset integration into the in-person field-based version of this course.

The second concern is with our use of the term "virtual" for individual station descriptions. We have no objection to the reviewer's comment here, and we acknowledge the distinction that the reviewer makes with examples of what are probably better examples of "virtual" outcrops. We will simply refer to the station descriptions as "station descriptions" in the revised manuscript. And we also agree with the reviewer that the overall module is appropriately considered "virtual" and so we will opt to keep that term in the manuscript title. Also, in reference to a later question from the viewer, we do not have immediate plans to convert some of these stations into what others might consider more conventional virtual outcrops, with photogrammetry for example. This is beyond the scope

of our intent.

Reviewer 1 also made some specific comments by line item. These are all very helpful and we will address them in our revised manuscript. We highlight a subset with responses below.

Line 82-84: Strabospot is a combination of a mapping platform, data management and storage tool, and field data collection tool. We will clarify that in the revised text. A figure with an example map is also requested – this is already included in the Supplemental materials – it is possible that the reviewer missed this (it is understandable since there are lot of supplemental files!)

Line 144: In reference to the Google Earth Web project, this is for planning and better visualization of the stations only – it is not required. While the satellite imagery resolution appears to be a little better than what is provided by StraboSpot, the main advantage is the extra 3-D visualization provided by Google Earth draping the imagery over a digital elevation model, which is not available in StraboSpot. We will try to make this more clear in the revised manuscript.

Line 167: Request is to clarify what students are requested to do for each station. This is a really good point that we will clarify in the revised text. We initially encourage students to copy and paste the text description of the outcrop information in its entirety into the “Notes” section of a Spot in Strabo – simply because it streamlines the process of going back to review ones notes later. But then the “filtering” process is where the students must decide which aspects of this description, or what specific data, are most important for mapping and working out field relationships. For example, in some outcrops, multiple orientation measurements may be provided, but perhaps only one that could be considered “representative” is necessary for entering into the specific orientation section of the Spot so that a strike and dip symbol can be displayed on the map. Or, as another example, some outcrops display conglomeratic horizons in the quartzite – this may not seem important to a student initially, but later they might decide that they want to go back to the descriptions and “tag” those outcrops with conglomeratic horizons for display on the map. It is quicker to do that if the full text description is already available in the Spot entry because it avoids the necessity of going back to the original Word files.

Line 220: Reviewer asks what is meant by “recreating” a plot. This could also benefit from some more clarification, which we will do. In most cases, “recreating” is not the best word; and we refer the reviewer and other readers to the phrase “meaningful figure” in the first half of the sentence in the current manuscript. The most straightforward form of this is that students who are working with one of the U-Pb geochronology datasets might be asked to pick a subset of the published data and plot it on their own version of a Concordia diagram – the result can then be compared with one of the diagrams from the publication, and the idea is that they gain a deeper appreciation for what these data mean, associated uncertainties, and how to read such diagrams. Another example is that for the advanced structure dataset, students might be directed to generate stereonet of structural data “collected” from this field area as part of this module – these data are not published elsewhere so “recreating” is definitely not the right word. But instead, there are published stereonet from overlapping areas to which the diagrams created by the students can be compared. The subsections in Section 4 on the individual datasets give some more detailed suggestions for what diagrams students can be asked to generate.

Line 233-235: Explain use of abbreviations for structure types (e.g., F2). Good point. We can explain this briefly, and provide a reference. But it is also important to point out that this notation is not imposed by any aspect of the module materials – the outcrop descriptions do not use this notation. Instead, this notation is to be determined by students with guidance from instructors.

Chapter 6: In reference to comparison with course before COVID and future of the course, this is an interesting point – prior to the pandemic, we did not incorporate the analytical datasets. I had not thought to do it before. But it has been such a success, that I do plan to incorporate these datasets into the in-person field-based version of the course in the future. We can add this reflection to the revised text.

There are other minor comments and corrections for which we thank the reviewer.