

## Reply on RC3

Sharon Bywater-Reyes and Beth Pratt-Sitaula

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Author comment on "A remote field course implementing high-resolution topography acquisition with geomorphic applications" by Sharon Bywater-Reyes and Beth Pratt-Sitaula, Geosci. Commun. Discuss., <https://doi.org/10.5194/gc-2021-26-AC4>, 2022

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*We thank Reviewer 2 for their constructive and thought-provoking comments.*

Reviewer 2

Bywater-Reyes and Prat-Sitalula present the structure of a remote field course that focuses on the application of remote sensing to geomorphology. The value of the course topic is clearly articulated and well cited. The course leveraged several 3D datasets acquired through different remote-sensing techniques. The students were given tasks of acquiring, building, manipulating, and analyzing data, and were evaluated on task completion (e.g., data measurements), report writing, hypothesis testing, interpretations, and data quality assessment. The authors describe how the course meets learning outcomes determined by the NAGT Teaching with Online Field Experiences.

Modern remote-sensing methods and data introduced in this field course have applications to both research and industry, so a description of how this course was implemented remotely has value to the geoscience education community. Some major strengths of this manuscript are 1) examples of the students' work which provide readers with a clear picture of student deliverables; 2) links to the published teaching materials used within the course; and 3) a schedule that depicts a logical flow of topics that culminates with a larger-scale project. Should someone want to implement a similar course, this document serves as a good resource.

As a *research* article, the manuscript would benefit from more data on student assessment and/or engagement. Some thoughts on how to enhance the research contributions of this manuscript are as follows:

*We agree that better data on student assessment is needed. We plan to restructure the manuscript fairly significantly as follows (based also on feedback from another reviewer).*

- *Introduction*
  - *1. Background (on why/what we did)*
  - *2. Value of course content geologically*
  - *3. Value of remote field learning to remove barriers to participation*
- *Overview of the course*
- *Methods in this study*
- *Course implementation and outcomes*

- *Lessons learned and implementation recommendations*

*In the new sections 2) and 4) we will also more clearly and consistently specify which activity, course, and NAGT learning outcomes that are supported by particular pieces of student evidence.*

- A comparison of student performances in this course to student performances in another course on remote sensing would add research value to the manuscript. Was a field-based version of this course previously offered at the University of Northern CO, or is there literature that documents a field-based remote-sensing-geomorph course with student assessments? It's unclear whether this course on remote-sensing data and geomorphology is novel in the university's course offerings, or if just the remote format in which it was taught is novel.

*Unfortunately, this was the only implementation of this particular course and although aspects of this course are found in other UNCO courses, it is sufficiently different and during the general upheaval from COVID, that direct comparisons do not seem valid. The curriculum in its current form was developed specifically because of the need to teach field methods remotely. We will make this clearer. The published curriculum combined with this manuscript provide guidance on implementation and outcomes.*

- Student engagement is referred to with regards to the difficulties surrounding computer access, long hours on Zoom, and a quote at the end of the paper by a single student. More student accounts of the remote-learning conditions and/or student reactions to the course would substantiate "difficult conditions" (line 356) and "student appreciation" (line 372) in the Lessons Learned section.

*We will add evidence from student discussion forums that support these claims.*

- There are general descriptions of what deliverables and abilities of the students were evaluated, and mastery levels were provided as percentages. The authors mention that as-needed problem solving and decision making were two of the NAGT learning outcomes that may have not been met. Is there an area of the projects or deliverables in which student performances were lower in general, and does this reveal a shortcoming in the remote nature of how the course was taught? I would be interested in this!

*Good point! We will more clearly state in the "Lessons learned and implementation recommendations" section the skills that students were strongest and weakest on during this course (with evidence drawn from student data).*

### **Minor edits and suggestions:**

Formatting: Structure from Motion photogrammetry (SfM) should be written first with "photogrammetry" attached, and subsequently referred to as SfM without the need to redefine the acronym in subsequent sections. Similarly, TLS only needs to be written out once if the authors intend to use the acronym TLS throughout the remainder of the manuscript.

*We will change as recommended*

Line 68: Diversity is quantified for the student population for this course. The authors say that it is the "most diverse major's course by the instructor." To substantiate this, how was this diversity assessed, and how does it compare quantitatively to previous courses taught by the instructor?

*We will more clearly define this and compare to demographics of other similar courses.*

Line 146 and 147: "lidar" is inconsistent with the use of the form "LiDAR" in the rest of the manuscript.

*We will make it consistent throughout the paper, following the style convention of Geosci Comm. If GC does not have a convention, we will use "lidar".*

Line 180: How did students access Agisoft Metashape? Did they use a remote connection to on-site computers, use the trial version, or were they provided with licenses from the school or another party?

*They were provided with a trial version which the instructor requested from Agisoft*

Tenses change several times throughout the paper, e.g., the sentence starting in 232 vs the sentence in 234, and sentence 218 vs 221.

*We will proofread for consistency on tense.*

Line 352: Depending on how the mention of diversity is handled in line 68, the mention of "diverse" with regards to students may be omitted.

*We will make sure that all references to "diversity" within the paper are self-consistent.*

Please also note the supplement to this comment:

<https://gc.copernicus.org/preprints/gc-2021-26/gc-2021-26-AC4-supplement.pdf>