

Interactive comment on “Laser vision: lidar as a transformative tool to advance critical zone science” by A. A. Harpold et al.

G. Grant (Referee)

gordon.grant@oregonstate.edu

Received and published: 9 March 2015

General comments:

This short but relatively dense paper provides an excellent state of the science review the application of LiDAR to critical zone science and related disciplines. The paper is somewhat encyclopedic in tone, with long lists of LiDAR-based applications and studies. Nevertheless it manages to convey the wide diversity of questions for which LiDAR and related technologies are redefining the time and space scales of useful data. Figure 1 is particularly useful in describing the space-time domain of relevant questions.

Overall the paper is generally well-written, but is wordy in places; specific comments

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below point to some of these. It will be of interest to both CZ scientists and students wishing to get a quick sense of both where the technology is today and where it might be headed. The vision for the future is well thought out, and provides specific suggestions for how these new technologies can be woven into critical zone science.

Some minor concerns: I would have liked to have seen some consideration of how lidar technologies might fit within large-scale “big data” efforts within the geoscience community like EarthCube. Also, there wasn’t much discussion of how LiDAR acquisition and utilization varies by geography – a big issue in thinking about how LiDAR could be used on continental scales.

Specific comments (mostly typographical):

Pg. 1020

Lines 4-5: Although the boundaries of the Critical Zone are a bit fuzzy, I would re-define the lower boundary as top of the fresh bedrock as opposed to bottom of the groundwater, in part because groundwater can vary over time.

Line 13: isn’t usual convention for capitalization LiDAR?

Line 17: A bit confusing since LiDAR doesn’t see bedrock unless it’s exposed at the surface

Pg. 1021

Lines 4-5: Awkward; reword for clarity

Pg 1024

Line 9: comma after “. . .technologies”

Pg. 1025

Line 9: correct misspelling “ta”

Line 10: Wordy; delete “in pursuit of”; just “to improve understanding”

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Lines 27-28: Reword to remove passive voice

Pg. 1026:

Line 3: Replace “having” with “had”

Pg. 1027:

Line 9: Missing word “of”

Pg. 1028:

Line 9: Awkward wording “progressing the capabilities. . .”

Line 18: Missing apostrophe “datasets”

Pg. 1030

Line 14: Awkward wording: “better recognition within CZ modeling. . .”. Meaning the CZ modeling community?

Pg. 1031

Line 18: insert comma after “systems”

Pg. 1034

Line 22: “complements” not “compliments”

Pg. 1035

Line 18: missing “it” afterand

Line 26: complement not compliment

Pg. 1036

Line 6: process not processes

Pg. 1038

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Line 16: Missing word?

Line 22: complement not compliment

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 1017, 2015.

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