Response (in italics) to: RC C1134

Interactive comment on "Use of laser-scan technology to analyse topography and flow in a weir pool" by P. E. Dresel et al.

Anonymous Referee #1

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The primary focus of the manuscript, based on the title, data presented, and conclusions is based on the method, not the implications of the data themselves. For this reason, I think this would work better as a Technical Note publication rather than a research article.

If the paper is modified into a technical note, than the authors could remove some of the project background because it isn't necessary for the method demonstration. Instead, it would be helpful if the authors discussed any similar uses of laser data. It appears that there have been some similar studies but nothing (that I found) that directly addresses the issue of drought and ephemeral streams. The manuscript would be stronger if it included the greater framework and explained how their work differs from similar studies.

I suggest the addition of a more detailed rationale earlier in the paper. While it's clearly a useful technique in the studied region, the implications for quantifying low flow and ephemeral waters are much bigger. That's worth highlighting.

> *The paper was reorganised and greater emphasis on the importance of quantifying low flows was added.*

Figure 6 nicely illustrates how this method can expand the data currently available from weirs.

The discussion about the sheet-pile extension and leakage are not needed if the paper is focused on the methodology. Instead, that discussion could be included as an application of the method.

> *The comment on the sheet-pile extension was addressed by moving it to the site description (the modification to the weir structure was already installed when the scanning was performed but the method was used to evaluate its effectiveness) and clarifying in the conclusions that the scanning of the pool area has applications to weir design.*

Potential papers to consider:

Tamari, S., J. Mory, and V. Guerrero-Meza. 2011. Testing a near-Infrared Lidar Mounted with a Large Incidence Angle to Monitor the Water Level of Turbid Reservoirs. ISPRS Journal of Photogrammetry and Remote Sensing 66:S85-S91.

Schumann, G., P. Matgen, M. E. J. Cutler, A. Black, L. Hoffmann, and L. Pfister. 2008. Comparison of Remotely Sensed Water Stages from Lidar, Topographic Contours and Srtm. ISPRS Journal of Photogrammetry and Remote Sensing 63:283-296.

> *Thank you for the references. The papers are now cited in the introductory discussion of hydrologic applications of laser scanning.*