

Landslides Triggered by Medicane Ianos in Greece, September 2020: Rapid Satellite Mapping and Field Survey

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Supplementary Material Content:

Figure S1. Comparison of field surveyed landslides with automatic satellite mapping results (a-g). Left: field photos (acquired October 1-3 2020); right: location map with automatic satellite mapping results (HazMapper [1]). Blue dots show mapped landslides from Sentinel-2 images and triangles with letter marking field locations of surveyed landslides. Location map for sites a-g (h) with Sentinel-2 landslides (orange).

Figure S2. Automatic satellite mapping results. Left: method results; middle: method results with mapped landslides (blue dots) and field survey locations (orange triangles); right: Sentinel-2 true colour image, acquired in September 30, 2020.

References

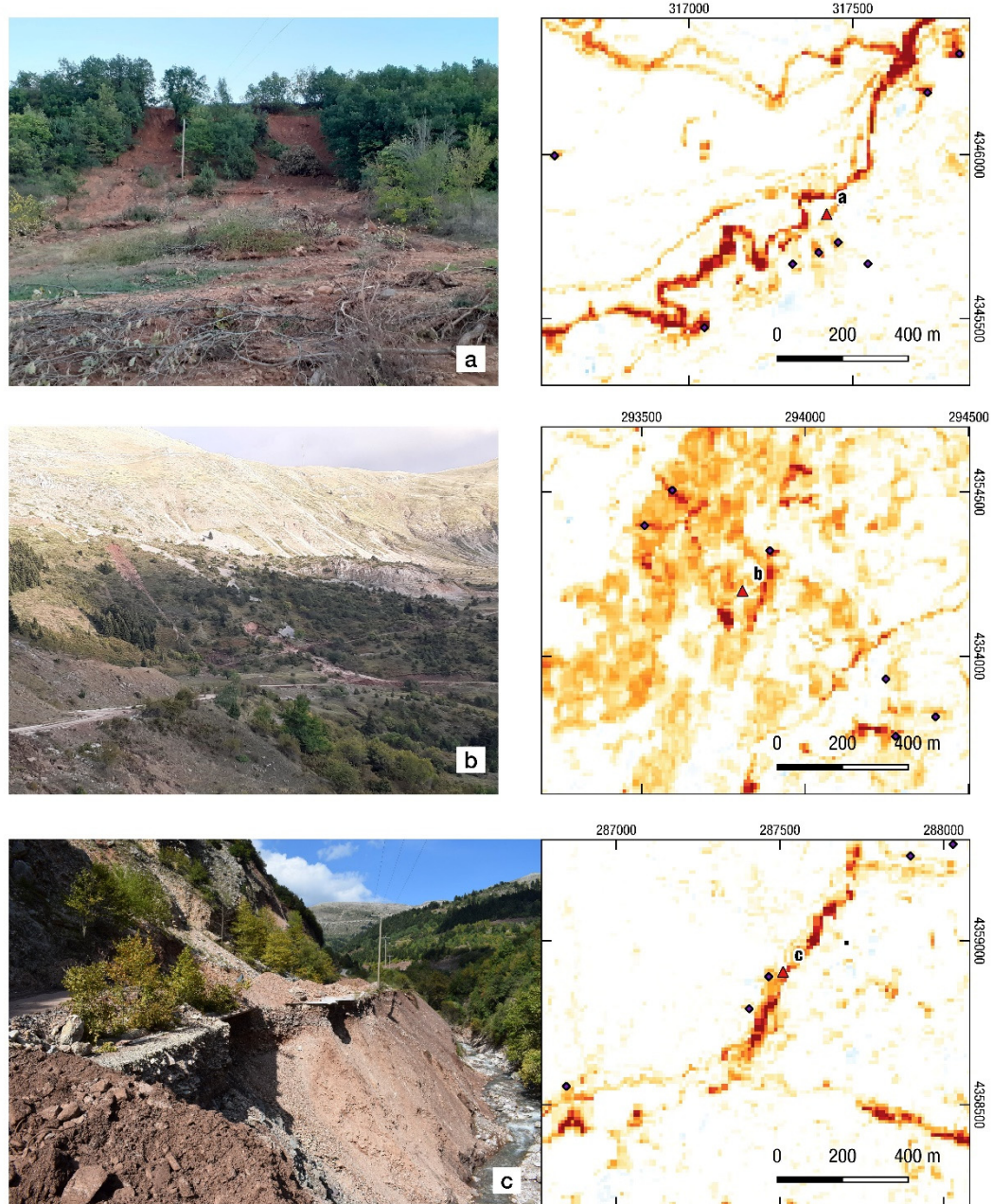


Figure S1. (a). *Continued.*

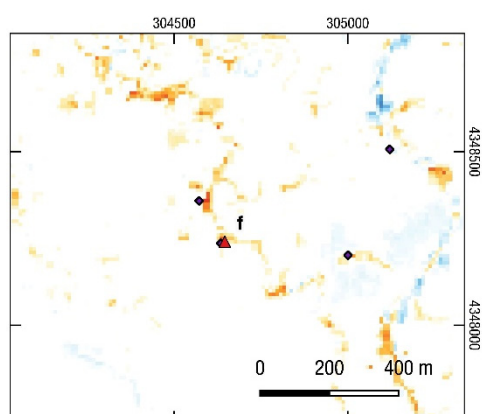
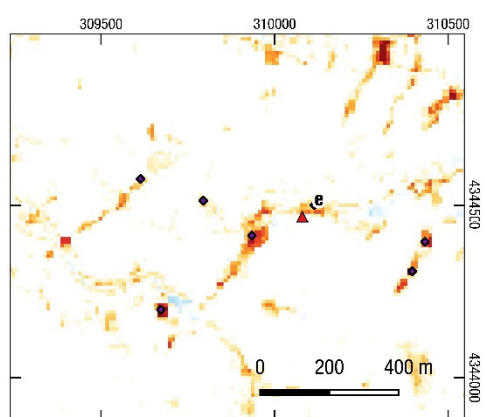
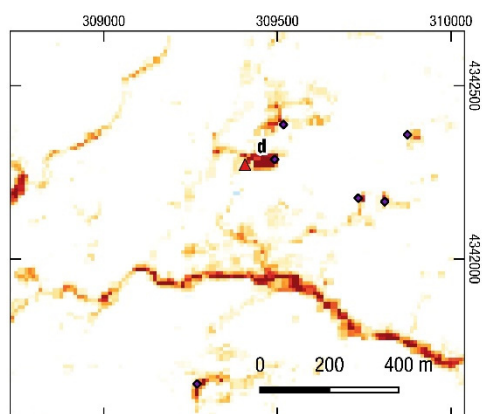


Figure S1. (b). *Continued.*

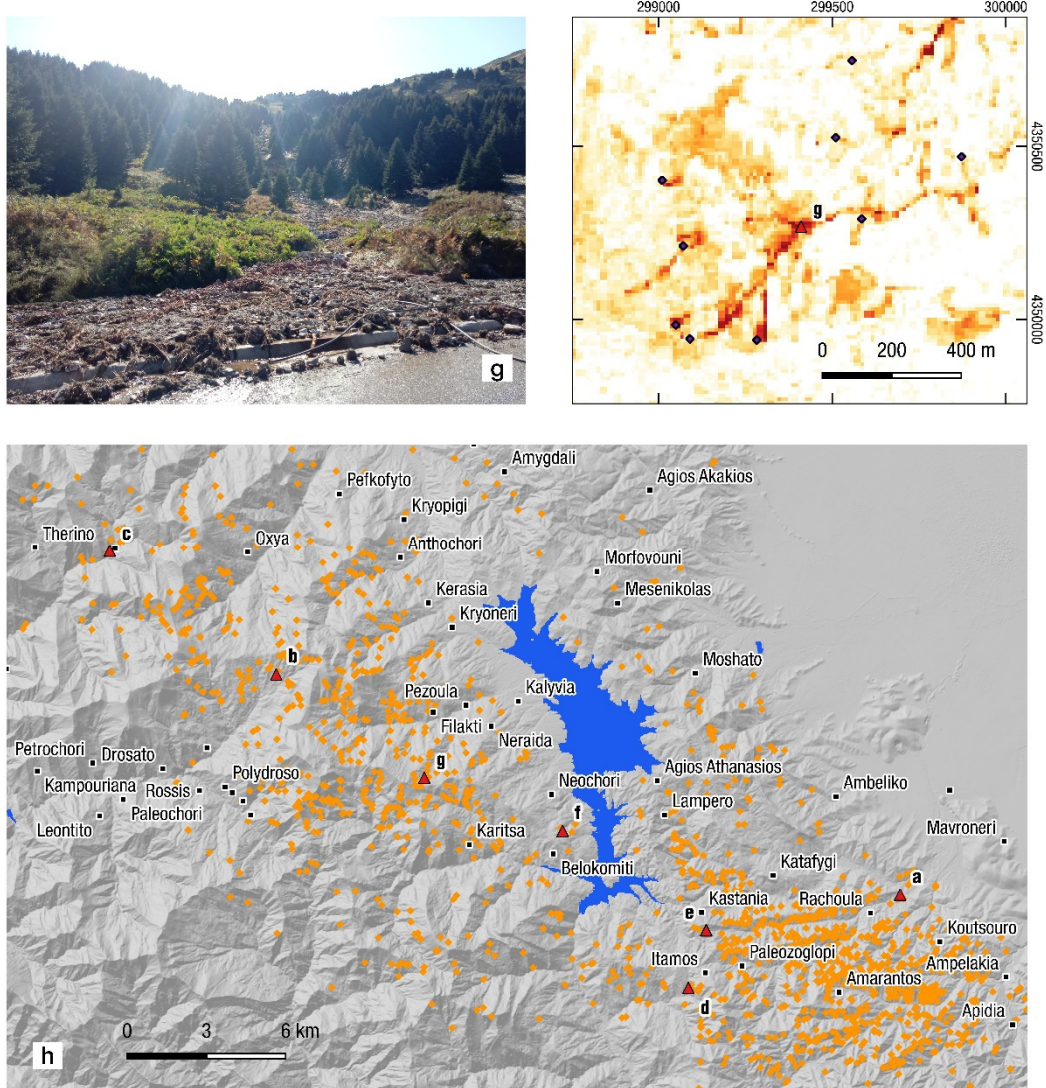


Figure S1. c). Comparison of field surveyed landslides with automatic satellite mapping results (a-g). Left: field photos (acquired October 1-3 2020); right; location map with automatic satellite mapping results (HazMapper [1]). Blue dots show mapped landslides from Sentinel-2 images and triangles with letter marking field locations of surveyed landslides. Location map for sites a-g (h) with Sentinel-2 landslides (orange).

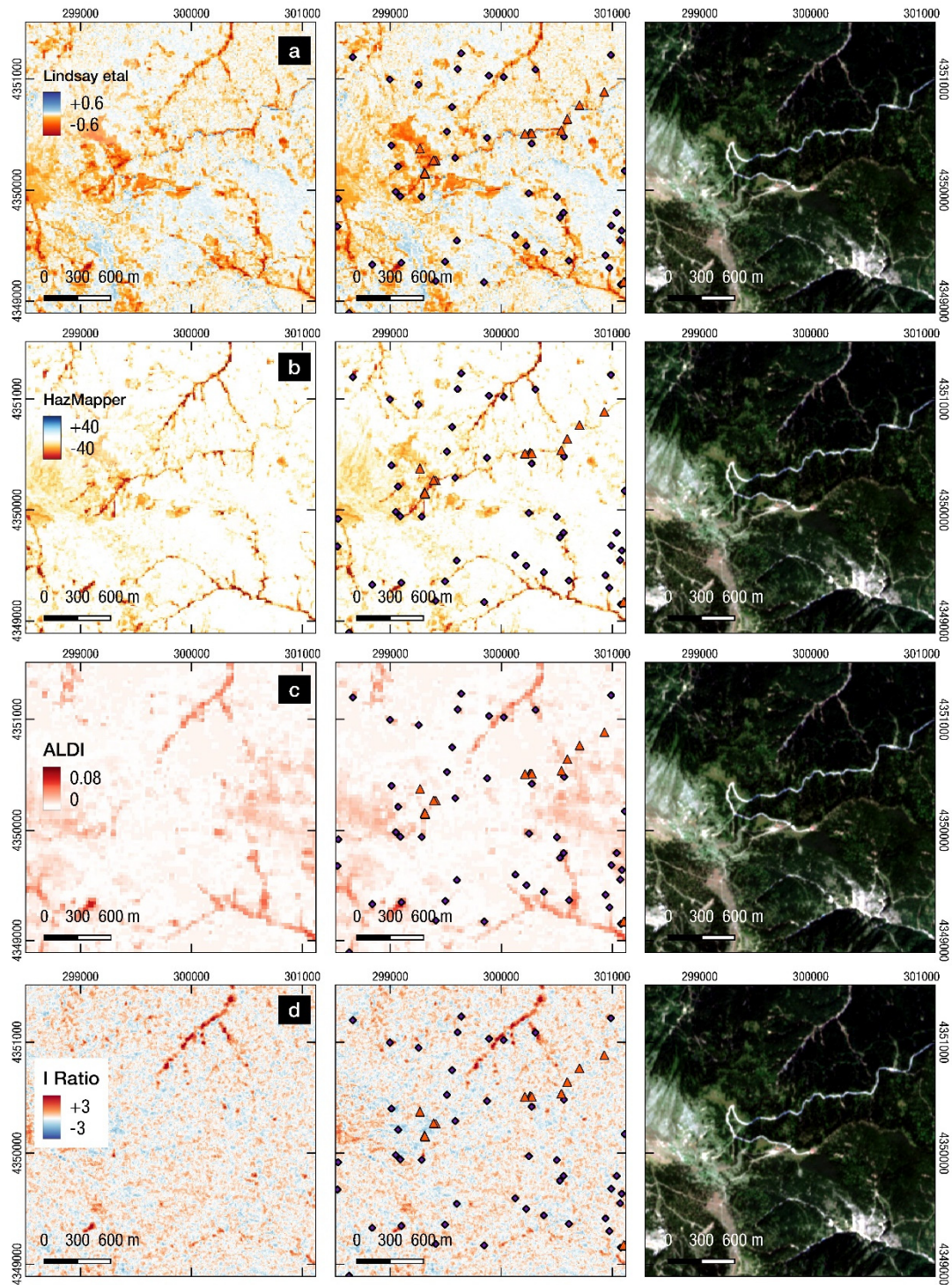


Figure S2. Automatic satellite mapping results. Left: method results; middle: method results with mapped landslides (blue dots) and field survey locations (orange triangles); right: Sentinel-2 true colour image, acquired in September 30, 2020.

References

1. Scheip, C.M., Wegmann, K.W. HazMapper: a global open-source natural hazard mapping application in Google Earth Engine. *Nat. Hazards Earth Syst. Sci.* **2021**, 21, 1495-1511.
2. Lindsay, E., Frauenfelder, R., Rüther, D., Nava, L., Rubensdotter, L., Strout, J., Nordal, S. Multi-Temporal Satellite Image Composites in Google Earth Engine for Improved Landslide Visibility: A Case Study of a Glacial Landscape. *Remote Sens.* **2022**, 14, 2301.
3. Milledge, D.G., Bellugi, D.G., Watt, J., Densmore, A.L. Automated determination of landslide locations after large trigger events: advantages and disadvantages compared to manual mapping. *Nat. Hazards Earth Syst. Sci.* **2022**, 22, 481-508.
4. Handwerger, A.L., Huang, M-H., Jones, S.Y., Amatya, P., Kerner, H.R., Kirschbaum, D.B. Generating landslide density heatmaps for rapid detection using open-access satellite radar data in Google Earth Engine. *Nat. Hazards Earth Syst. Sci.* **2022**, 22, 753-773.