



Surface classification and change detection in an alpine proglacial zone: application of terrestrial SfM photogrammetry and 3D point cloud processing techniques (Turtmann Valley, Switzerland)

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The Structure from Motion (SfM) workflow allows computation of 3D information from a set of images of the same scene and is of increasing interest in geomorphology. First, because image matching algorithms provide data at resolution and quality comparable to LiDAR and classic photogrammetry but with significantly higher automation and second since it is an extremely inexpensive methodology and needs little training. The basic SfM output is a coloured point cloud that can be georeferenced from a small number of ground control points. However, there is a clear need for point cloud processing tools to analyse heterogeneous natural surfaces in 3D. This case study exemplifies the use of open source and free to download SfM and point cloud processing tools to i.) classify and separate surface features and ii.) to quantify surface changes and landform development in the Turtmann glacier forefield (Switzerland).