## **Online supplementary material**



Figure 1 Overview of UAS flight path with GCP distribution.



**Figure 2** Input data of UAS orthoimages at 0.16 m resolution (a) 13.07.2018, (b) 24.07.2019, (c) 04.09.2019 and PlanetScope satellite images at 3 m resolution (d) 19.07.2018, (e) 24.07.2019, (f) 04.09.2019.



**Figure 3** DIC outputs for Interval I (13.07.2018–24.07.2019, 376 d) and II (24.07.2019–04.09.2019, 42 d) of UAS orthophotos at 0.16 m resolution for COSI–Corr parameter settings 128 x 32, step size 1 and 2 robustness iterations. Interval I (a) and II (g) are total displacements; (b) and (h) show total displacement with vectors filtered for a direction between 205°

and 280° and a length larger than 0.5 m; (c) and (i) display the total displacement in combination with the result of signal-tonoise calculations (40 % transparency); (d) and (j) are only signal-to-noise calculations (40 % transparency). The last two rows show displacements of East-West orientation for (e) and (k) while North-South are orientations for (f) and (l) prior to total displacement calculations. The solid black line represents the boundary of the active landslide based on field mapping. Background: hillshade of Lidar DEM, 1 m resolution (© SAGIS).



**Figure 4** DIC outputs for (a) Interval I (13.07.2018-24.07.2019, 376 d) and (b) II (24.07.2019-04.09.2019, 42 d) of UAS orthophotos at 0.16 m resolution for COSI–Corr parameter settings 128 x 32, step size 1 and 2 robustness iterations. Blue crosses indicate GCP distribution. The solid black line represents the boundary of the active landslide based on field mapping. Background: hillshade of Lidar DEM, 1 m resolution ( $\mbox{@ SAGIS}$ ).



**Figure 5** DIC total displacements for Interval I (13.07.2018–24.07.2019, 376 d) at 0.16 m resolution with different parameter setting combinations and signal–to–noise calculations for (f) and (i), both displayed with 40 % transparency. The solid black line represents the boundary of the active landslide based on field mapping. Background: hillshade of Lidar DEM, 1 m resolution (© SAGIS).



**Figure 6** Identical profiles for total displacement for (a) Interval I (13.07.2018-24.07.2019, 376 d) and (b) II (24.07.2019-04.09.2019, 42 d) of UAS orthophotos at 0.16 m resolution for COSI-Corr parameter settings  $128 \times 32$ , step size 1 and 2 robustness iterations. Yellow profile line is identical for (a) and (b) with corresponding profiles below. Grey outline bars point to distinct changes in profile and DIC result. The solid black line represents the boundary of the active landslide based on field mapping. Background: hillshade of Lidar DEM, 1 m resolution (© SAGIS).



**Figure 7** DIC total displacements for Interval I (13.07.2018-24.07.2019, 376 d) at 0.16 m resolution with different window setting combinations for step size 4. The solid black line represents the boundary of the active landslide based on field mapping. Background: hillshade of Lidar DEM, 1 m resolution (© SAGIS).



**Figure 8** Results of DIC total displacement calculations of UAS DSM at 0.16 m resolution with COSI-Corr for both Intervals I (13.07.2018–24.07.2019, 376 d) and II (24.07.2019–04.09.2019, 42 d). Parameter settings were 128 x 32, step size 2 with 2 robustness iterations. The solid black line represents the boundary of the active landslide based on field mapping. Background: hillshade of Lidar DEM, 1 m resolution (© SAGIS).



**Figure 9** Results of DIC total displacement calculations of UAS hillshades at 0.16 m resolution with COSI-Corr for both Intervals I (13.07.2018–24.07.2019, 376 d) and II (24.07.2019–04.09.2019, 42 d). Parameter settings were 128 x 32, step size 2 with 2 robustness iterations. The solid black line represents the boundary of the active landslide based on field mapping. Background: hillshade of Lidar DEM, 1 m resolution (© SAGIS).



**Figure 10** Total displacement results of DIC-FFT tool of UAS orthoimages at 0.16 m resolution for interval I and II with different window size parameters. The solid black line represents the boundary of the active landslide based on field mapping. Background: hillshade of Lidar DEM, 1 m resolution (© SAGIS).



**Figure 11** Volume difference calculations of UAS DSM at 0.16 m spatial resolution for Interval I (13.07.2018–24.07.2019, 376 d) and II (24.07.2019–04.09.2019, 42 d). Background UAS orthoimage from 04.09.2019. The solid black line represents the boundary of the active landslide based on field mapping.



**Figure 12** Volume difference calculations for Interval I (13.07.2018–24.07.2019, 376 d) of UAS DSM at 0.16 m spatial resolution with background UAS orthoimages from (a) 13.07.2018 and (b) 24.07.2019. The maps displayed are south of the active area. The solid black line represents the boundary of the active landslide based on field mapping.



**Figure 13** Results of DIC total displacements of PlanetScope images at 3 m resolution. The solid black line represents the boundary of the active landslide based on field mapping. Background: hillshade of Lidar DEM, 1 m resolution (© SAGIS).



**Figure 14** PlanetScope image co-registration. Left: distribution of master and slave feature points after transformation. Right: number of transformed inlier feature points of the target image to their corresponding feature matches in the reference image including their distrubtion and mean distance.