

SUPPLEMENTARY MATERIALS

Displacement Residuals Reveal Landslide Regime Shifts

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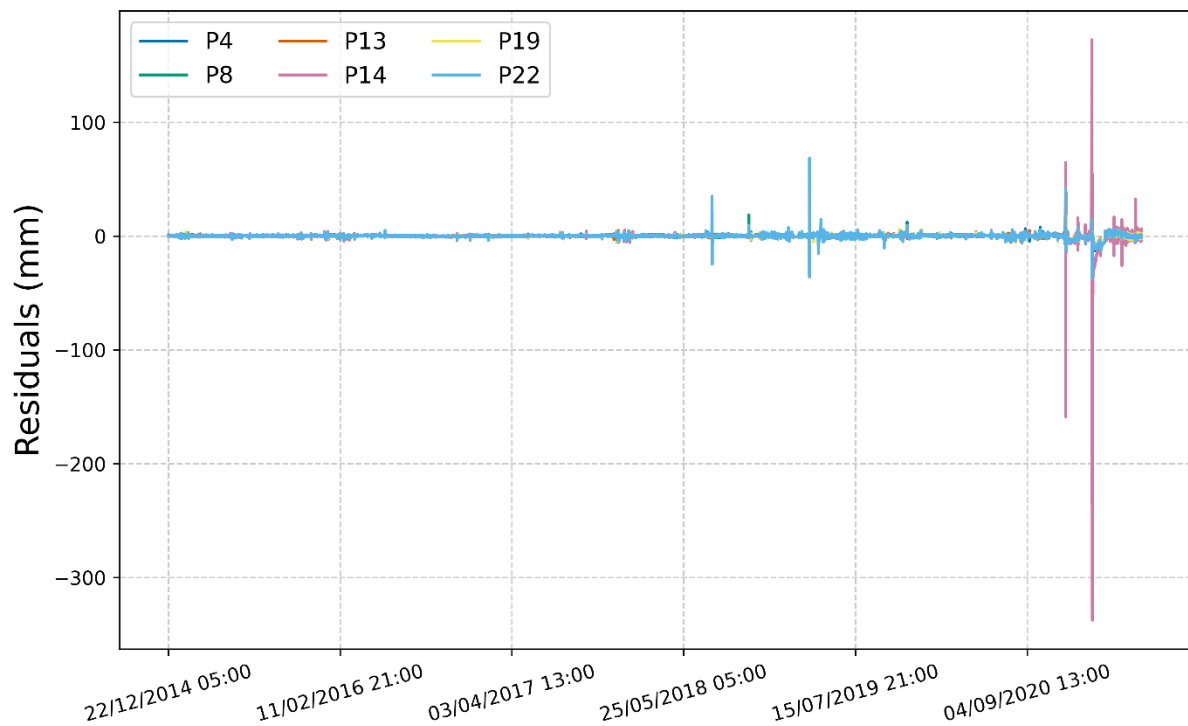


Figure S1. Sant'Andrea landslide. Mean of residuals per 24h for the 6 monitoring points located in the unstable landslide area.

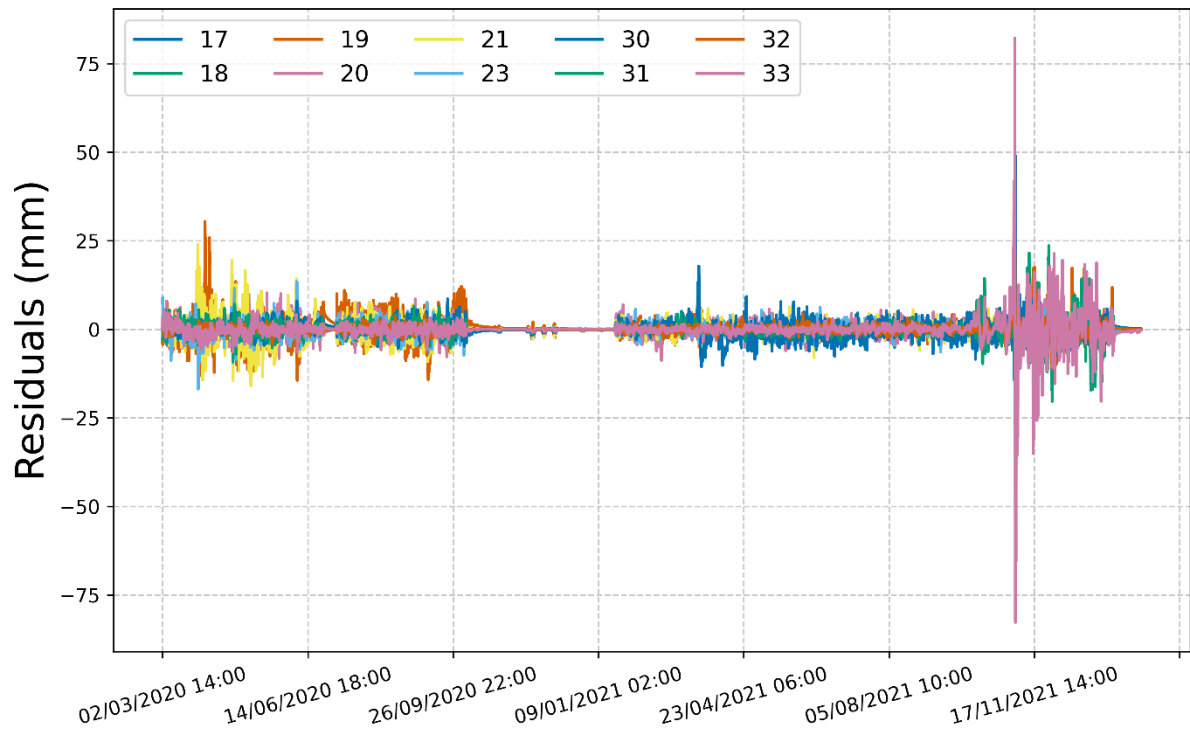


Figure S2. Pomarico landslide. Mean of residuals per 24h for each monitoring point located in the moving landslide area.

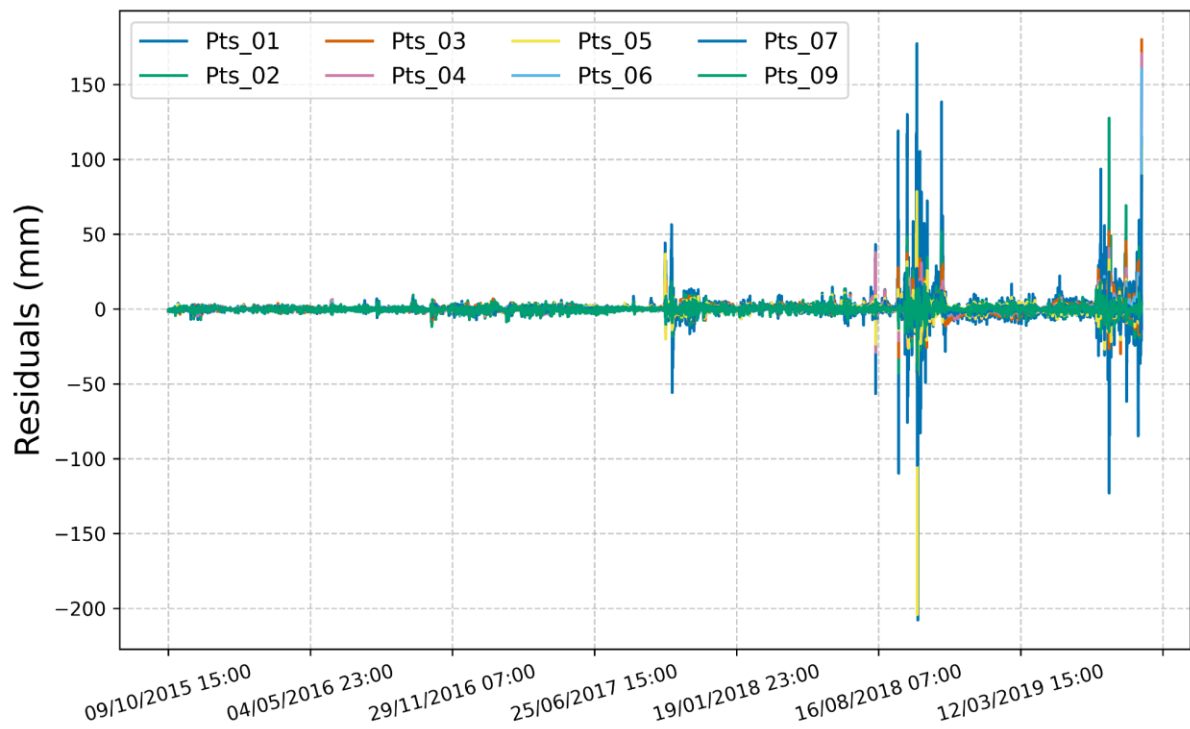


Figure S3. Veslemannen landslide. Mean of residuals per 24h for each monitoring point located in the moving landslide area.

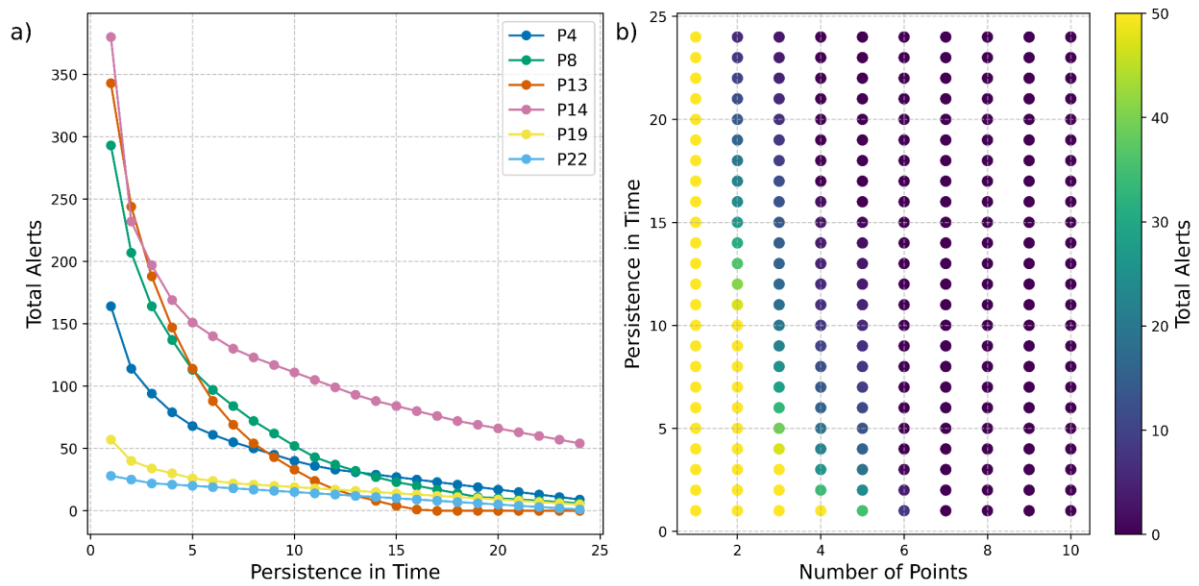


Figure S4. *Sant'Andrea landslide.* a) Effect of the PiT on the number of times each monitoring point exceeds the threshold during the test year. b) Effect of the combination of PiT and the number of points that exceed the threshold simultaneously on the overall number of alerts the LRSD delivers.

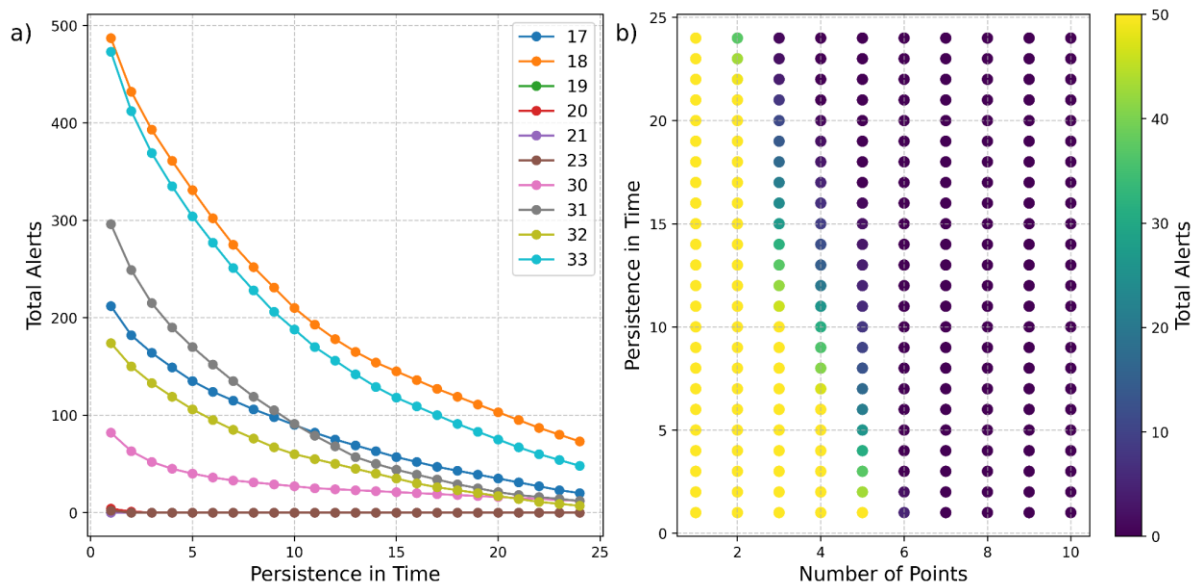


Figure S5. *Pomarico landslide.* a) Effect of the PiT on the number of times each monitoring point exceeds the threshold during the test year. b) Effect of the combination of PiT and the number of points that exceed the threshold simultaneously on the overall number of alerts the LRSD delivers.

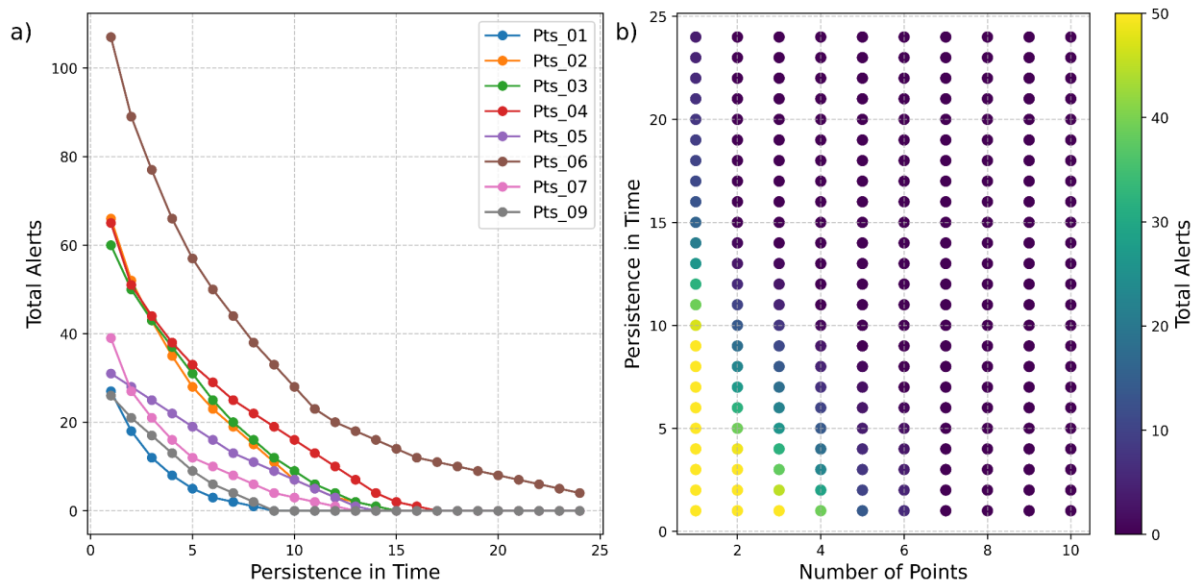


Figure S6. Veslemannen landslide. a) Effect of the PiT on the number of times each monitoring point exceeds the threshold during the test year. b) Effect of the combination of PiT and the number of points that exceed the threshold simultaneously on the overall number of alerts the LRSD delivers.

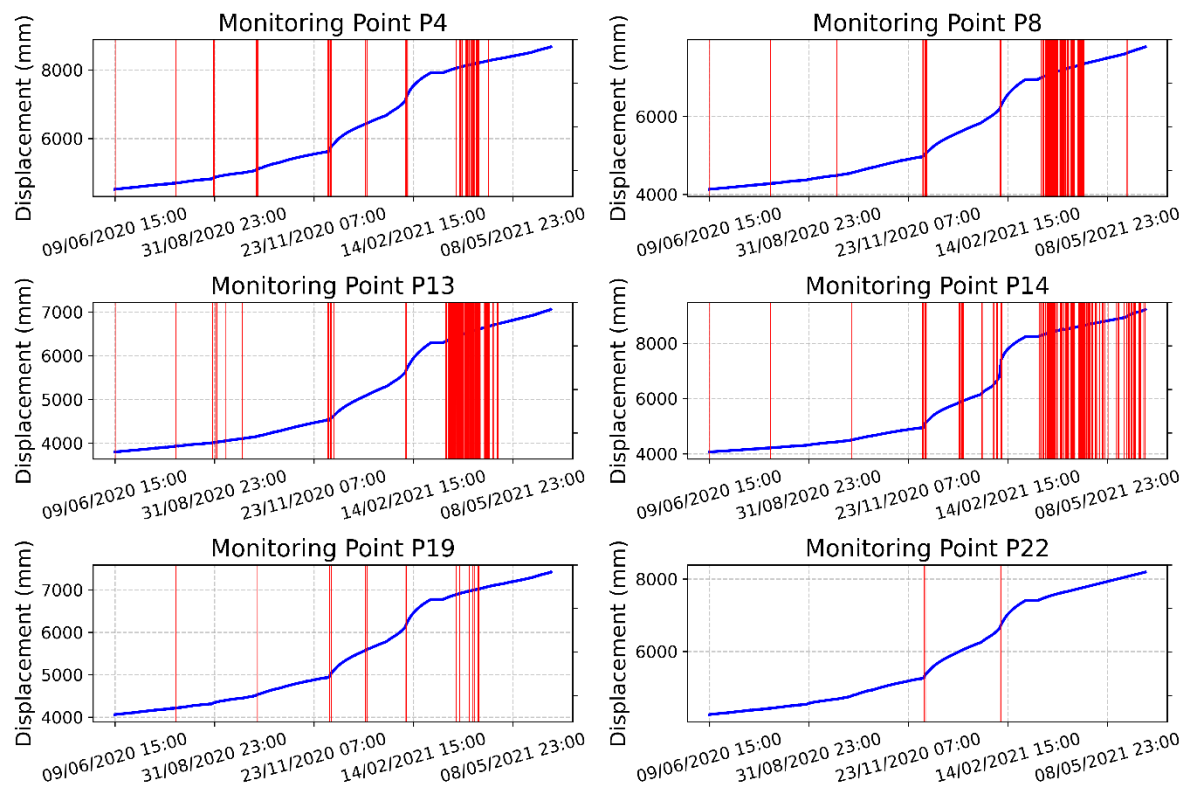


Figure S7. Sant'Andrea landslide. Measured cumulative displacement (blue) and instances in which the threshold is exceeded for each monitoring point (red) located in the unstable landslide area.

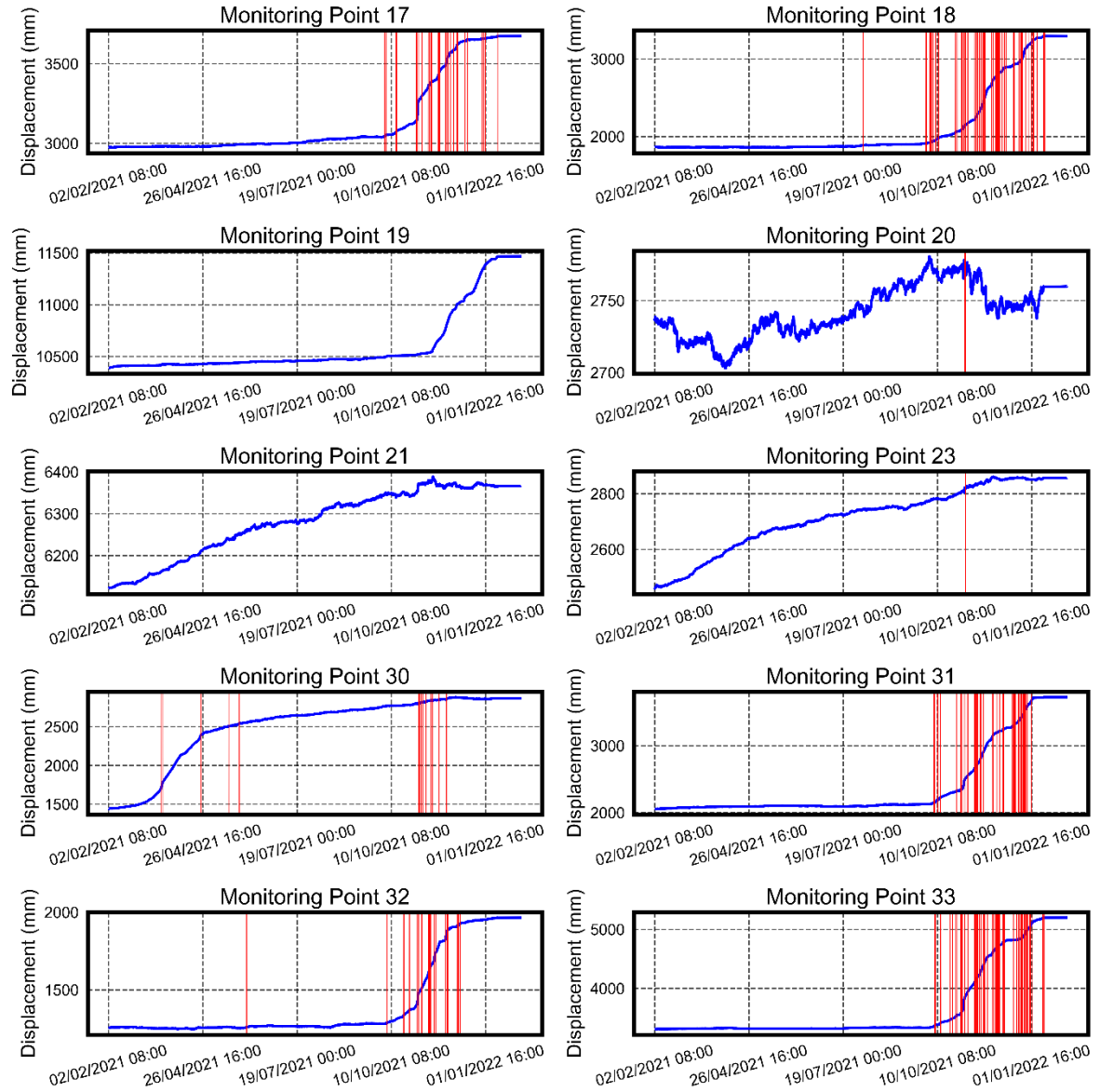


Figure S8. Pomarico landslide. Measured cumulative displacement (blue) and instances in which the threshold is exceeded for each monitoring point (red) located in the unstable landslide area.

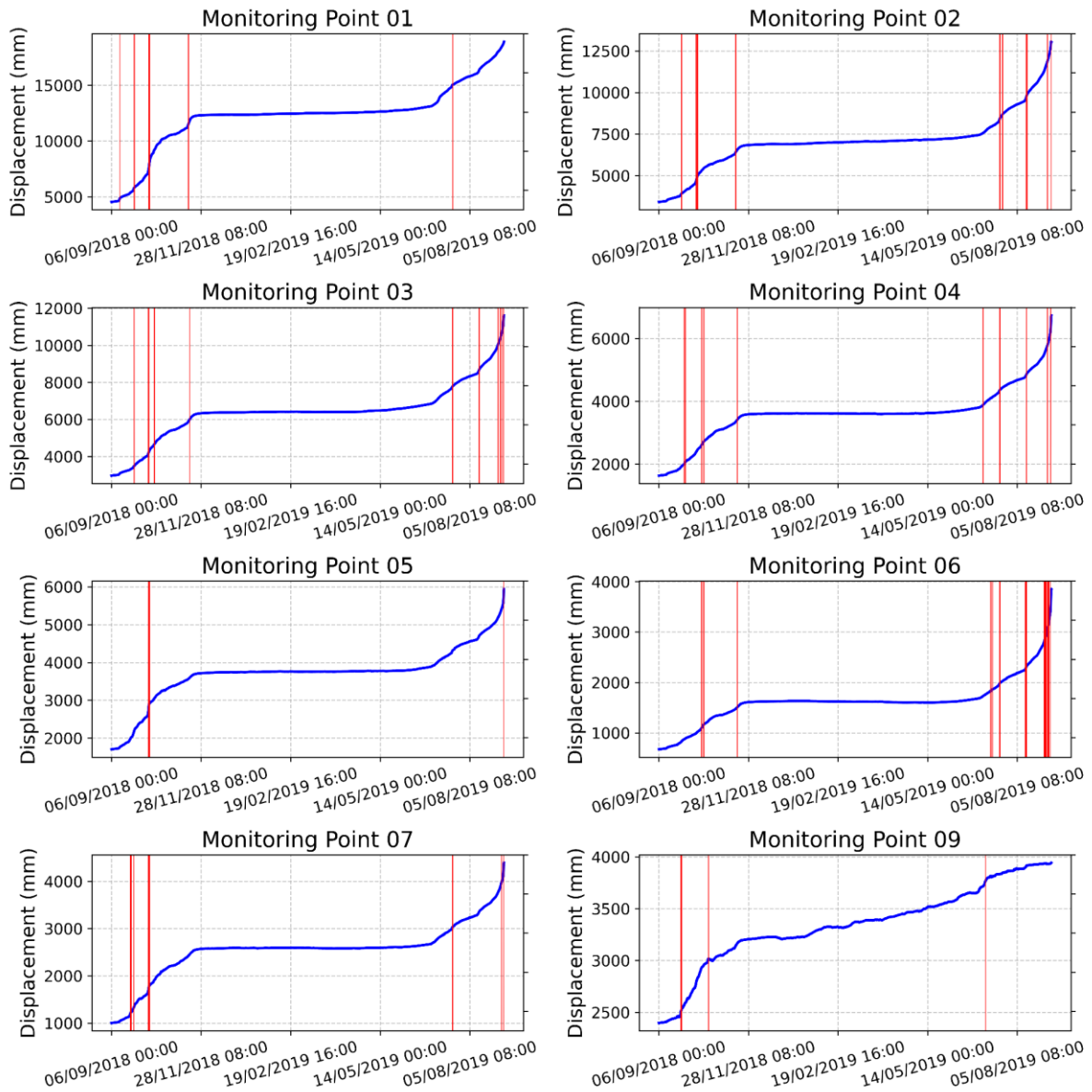


Figure S9. Veslemannen landslide. Measured cumulative displacement (blue) and instances in which the threshold is exceeded for each monitoring point (red) located in the unstable landslide area.

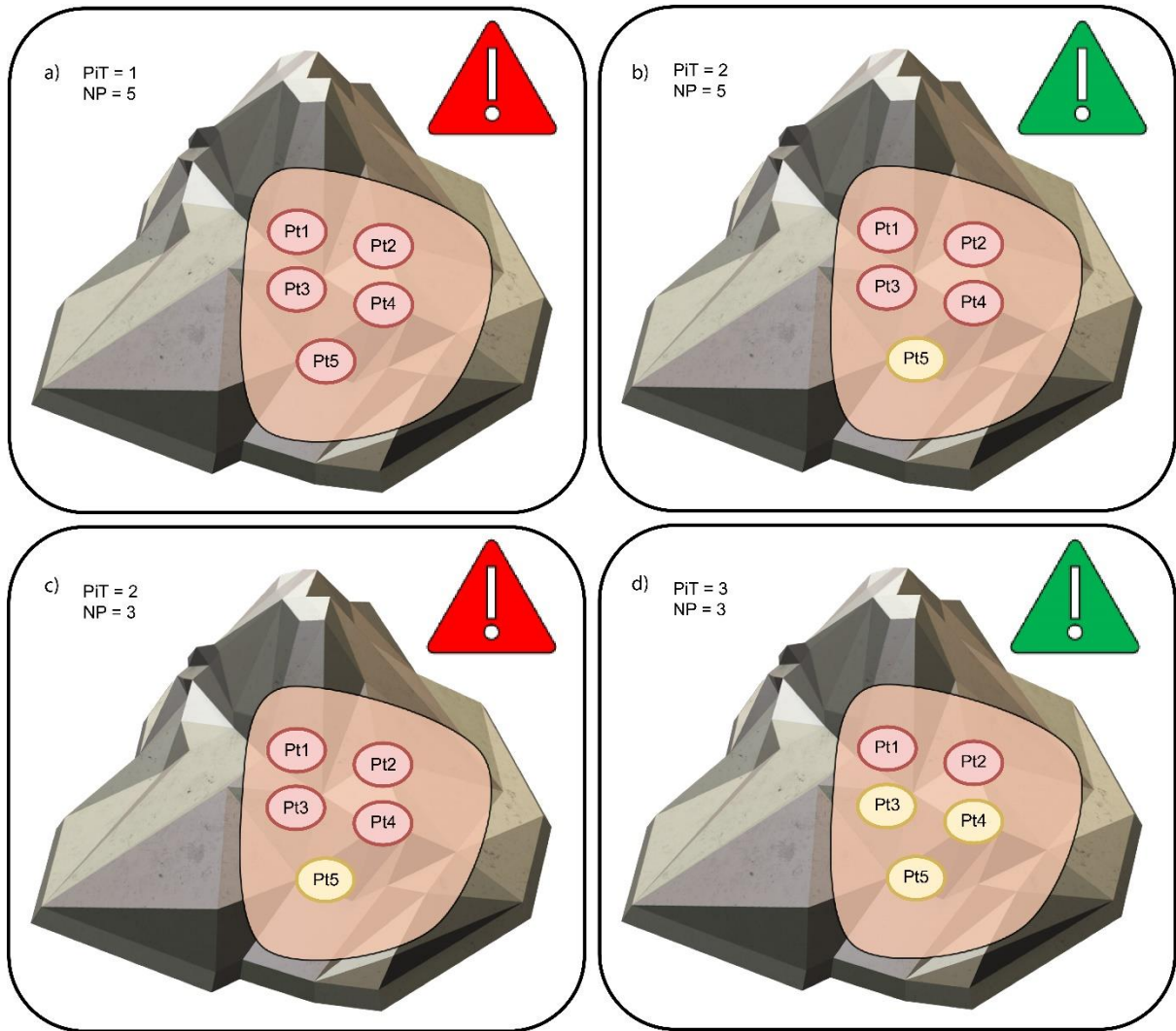


Figure S10. Conceptual simulation of PiT and NP effect on the final alert, assuming that in the last 3 hours $Pt1$ and $Pt2$ exceeded r^* 3 times consecutively; $Pt3$ and $Pt4$ exceeded r^* 2 times consecutively; and $Pt5$ exceeded r^* 1 time. a) shows a delivered alert, as all the 5 points respect the $PiT = 1$ requisite and NP is = 5. In b) just 4 out of the 5 ($NP = 5$) points exceed the threshold, therefore no alert is delivered. In c) an alert is delivered as 4 points out of the 3 ($NP=3$) needed respect the $PiT = 2$ criteria. In d) no alert is issued as just 2 out of the 3 ($NP=3$) points needed respect the PiT criteria.