Supplementary Material

# Supplementary Data

## Supplementary Dataset 1: List of SAR scenes used for SAR ACD time series processing. This information is contained in the same folder as this document.

# Supplementary Figures and Tables

## Supplementary Tables

**Supplementary Table 1:** This table outlines the details associated with the Synthetic Aperture Radar (SAR) images processed. For those SAR scenes used to create the time series please refer to Supplementary Dataset 2.



**Supplementary Table 2:** Details of the landslide inventory including condition (new, reactivated etc.), whether or not the landslide is a new observation (i.e. not observed in the field), the method used to map the feature initially, whether or not the feature can be seen in the NDVI or LIDAR differenced map, the area, length and width of the landslides, the landslide type, the vegetation at the landslide site and the orientation of the landslide. Vegetation categories include sparse, shrubbery, high density (hd) trees, low density (ld) trees, and no vegetation (none).

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **id** | **condition** | **Newly ID?** | **map\_method** | **NDVI\_ID** | **Lidar\_ID** | **Area (SQ. M)** | **Length (m)** | **Width (m)** | **gf\_feature** | **Vegetation** | **Orientation** |
| 1 | additional retreat | N | lidar, field observations | Y | Y | 1876.812 | 37.438 | 55.063 | soil slide | sparse | SW |
| 2 | reactivation | N | lidar, field observations | Y | Y | 13797.98 | 89.727 | 194.212 | soil block slide | shrubbery | SW |
| 3 | additional retreat | N | lidar, field observations | Y | Y | 1159.259 | 73.4 | 13.017 | soil slide | sparse | SW |
| 4 | additional retreat | N | lidar, field observations | Y | Y | 2289.294 | 67.644 | 31.235 | soil slide | sparse | SW |
| 5 | additional retreat | N | lidar, field observations | N | Y | 2514.805 | 13.417 | 203.072 | soil slide | sparse | SW |
| 6 | reactivation | N | lidar, field observations | Y | Y | 13577.5 | 77.458 | 246.484 | rapid soil flow | hd trees | SW |
| 7 | reactivation | N | lidar, field observations | Y | Y | 2460.078 | 55.849 | 46.708 | rapid soil flow | hd trees | SW |
| 8 | reactivation | N | lidar, field observations | Y | Y | 498.745 | 23.981 | 23.256 | rapid soil flow | hd trees | SW |
| 9 | reactivation | N | lidar, field observations | Y | Y | 1499.766 | 55.134 | 29.801 | rapid soil flow | hd trees | SW |
| 10 | reactivation | N | lidar | Y | Y | 1347.566 | 30.265 | 55.327 | rapid soil flow | hd trees | SW |
| 11 | additional retreat | N | lidar | N | Y | 386.311 | 41.925 | 10.705 | soil slide | hd trees | SW |
| 13 | new | N | lidar, field observations | Y | Y | 4305.418 | 77.702 | 48.705 | soil slump | ld trees | NW |
| 14 | new | Y | lidar | Y | Y | 523.874 | 19.756 | 35.531 | soil slump | ld trees | NW |
| 17 | additional retreat | N | lidar | N | Y | 765.868 | 62.105 | 17.06 | soil slide | sparse | SW |
| 18 | reactivation | N | lidar | Y | Y | 14114.51 | 84.956 | 182.939 | soil block slide | shrubbery | SW |
| 19 | reactivation | N | lidar | Y | Y | 6843.942 | 48.016 | 185.788 | soil block slide | shrubbery | SW |
| 24 | new | N | field observations | N | N | N/A | N/A | N/A | soil slump | sparse | SW |
| 26 | additional retreat | N | lidar, field observations | Y | Y | 1036.77 | 12.976 | 111.295 | soil slide | sparse | SW |
| 27 | additional retreat | N | lidar, field observations, orthophotos | N | Y | 337.969 | 61.163 | 8.282 | soil slide | sparse | SW |
| 28 | additional retreat | N | lidar, field observations, orthophotos | N | Y | 619.479 | 7.073 | 141.069 | soil slide | sparse | SW |
| 36 | additional retreat | N | field observations | N | N | N/A | N/A | N/A | soil slide | none | NW |
| 39 | new | N | field observations | N | N | N/A | N/A | N/A | soil slump | ld trees | UNK |
| 40 | new | N | lidar, field observations | N | Y | 2224.699 | ﻿12.995 | 109.472 | rock fall | none | SW |
| 41 | new | N | field observations, orthophotos | Y | Y | 1019.604 | 20.953 | 85.642 | soil slump | sparse | E |
| 44 | new | N | lidar, field observations | N | Y | 26.809 | 2.757 | 11.317 | soil slump | sparse | SW |
| 45 | additional retreat | N | lidar, field observations | N | Y | ﻿1319.519 | ﻿16.939 | ﻿88.740 | soil slump | ld trees | SE |
| 46 | additional retreat | N | lidar, field observations | N | Y | 807.018 | 45.195 | 17.887 | soil slide | none | SW |
| 47 | additional retreat | N | lidar, field observations | N | Y | 711.81 | 45.905 | 19.412 | soil slide | ld trees | SW |
| 48 | additional retreat | N | lidar, field observations | N | Y | 945.848 | 55.071 | 19.856 | soil slide | ld trees | SW |
| 49 | additional retreat | N | lidar | Y | Y | 2667.143 | 46.511 | 78.546 | soil slide | ld trees | NE |
| 50 | new | N | lidar, field observations | N | Y | 50.47 | 3.211 | 25.032 | soil slump | sparse | NW |
| 54 | new | N | lidar | Y | Y | 1434.139 | 31.813 | 47.074 | soil slump | sparse | NW |
| 55 | additional retreat | Y | lidar | Y | Y | 3298.572 | 18.927 | 171.658 | soil slide | none | SW |
| 57 | additional retreat | N | lidar | N | Y | 1247.005 | 7.743 | 108.034 | soil slide | none | SE |
| 58 | new | N | lidar, field observations | N | Y | 2124.933 | 64.124 | 33.894 | soil slide | none | W |
| 60 | new | Y | lidar, field observations | Y | Y | 355.155 | 12.578 | 33.526 | rapid soil flow | hd trees | SW |
| 61 | new | Y | lidar, field observations | Y | Y | 493.511 | 43.036 | 13.828 | rapid soil flow | hd trees | SW |
| 62 | new | Y | lidar, field observations | N | Y | 285.046 | 27.058 | 8.571 | rapid soil flow | hd trees | SW |
| 63 | reactivation | N | lidar | N | Y | 891.296 | 15.966 | 67.198 | rapid soil flow | hd trees | SW |
| 65 | reactivation | N | field observations | N | N | 411.051 | 20.19 | 27.662 | rock fall | none | SW |
| 69 | reactivation | N | lidar | N | Y | 202.133 | 24.432 | 7.882 | soil slide | none | NW |
| 72 | new | N | field observations | N | N | n/a | n/a | n/a | soil sliump | sparse | SW |
| 78 | new | N | lidar, field observations | Y | Y | 734.042 | ﻿32.928 | ﻿23.156 | soil slide | ld trees | NE |

**Supplementary Table 3:** This table describes the level of certainty assigned to each mapped landslide. Certainty is determined by assigning a certainty level for three different categories. The categories are presence, location and delineation. Presence is defined as the confidence the mapper has that the landslide feature exists, location is the certainty that the mapped location is accurate and the last category is the certainty regarding the delineation of the landslide. How certainty is assigned per category is defined below the table.

|  |  |  |  |
| --- | --- | --- | --- |
| id | presence | location | delineate |
| 1 | a | a | a |
| 2 | a | a | a |
| 3 | a | a | a |
| 4 | a | a | a |
| 5 | a | a | a |
| 6 | a | a | a |
| 7 | a | a | a |
| 8 | a | a | a |
| 9 | a | a | a |
| 10 | a | a | a |
| 11 | a | a | a |
| 13 | a | a | a |
| 14 | b | a | a |
| 17 | a | a | a |
| 18 | a | a | a |
| 19 | a | a | a |
| 24 | b | a | d |
| 26 | a | a | a |
| 27 | a | a | a |
| 28 | a | a | a |
| 39 | b | d | d |
| 40 | a | b | b |
| 41 | a | a | a |
| 44 | a | a | a |
| 45 | a | a | a |
| 46 | a | a | a |
| 47 | a | a | a |
| 48 | a | a | a |
| 49 | b | a | a |
| 50 | a | a | a |
| 54 | a | a | a |
| 55 | b | a | a |
| 57 | b | a | a |
| 60 | a | a | b |
| 61 | b | a | b |
| 62 | b | a | b |
| 63 | b | a | a |
| 65 | b | a | a |
| 69 | a | b | b |
| 72 | a | b | d |
| 36 | a | b | d |
| 78 | a | a | a |
| 58 | b | a | b |

**Presence Certainty**

A. Ground failure definitely exists

B. Ground failure probably exists

C. Ground failure might exist

**Location Certainty**

A. Can be exactly relocated (<10 m accuracy)

B. Can be located within 10 m-1 km (dm accuracy)

C. Can be located within 1-3km (km accuracy)

D. Can be located to a general region (insufficient information for more accurate location)

**Delineation Certainty**

A. Can exactly draw outline of feature (m accuracy)

B. Can draw general shape of feature (dm accuracy)

C. Can define boundary of feature (km accuracy)

D. Not enough information to define feature boundary or shape (no polygon

**Supplementary Figure 1:** Probability distributions of the Synthetic Aperture Radar (SAR) amplitude change detection results for all landslide types.

**![A picture containing table

Description automatically generated]()**

**Supplementary Figure 2:** Probability distributions of elevation differencing and NDVI differencing data after smoothing the data, using a gaussian filter, to remove noise (filtered to a kernel of 45x 45 m and 50 x 50 m respectively).

Chart, histogram, box and whisker chart

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