Supplementary Material for:
Seismic response of a slow-moving landslide: exploring data from two years of seismic monitoring at the Hollin Hill Landslide Observatory (UK)

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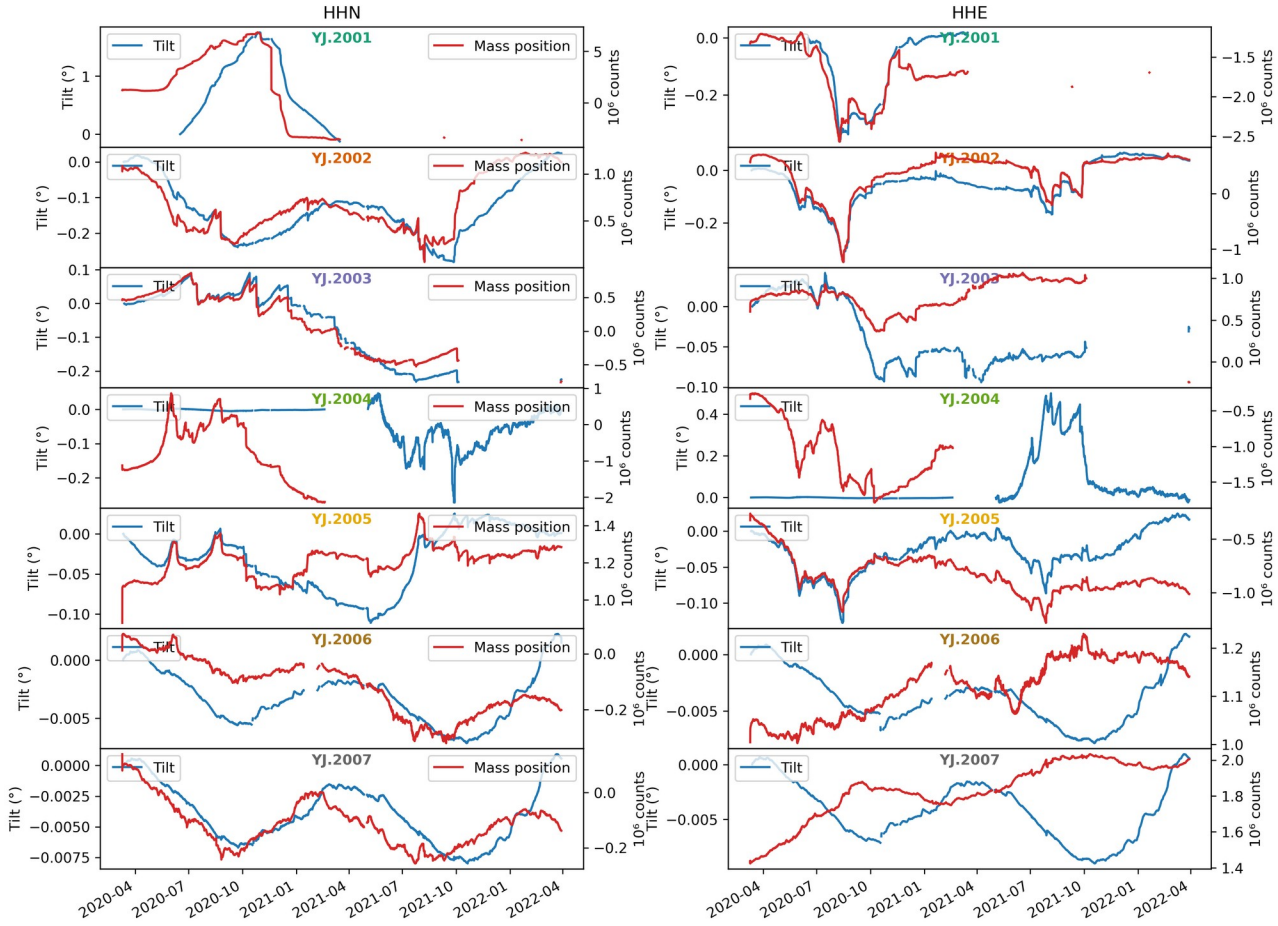

Figure S1: Comparison between the seismically-derived tilt data retrieved following the approach of Wenner et al. (2022) and the mass position trace recorded by the 6TDs. Note that for YJ.2004, the seismometer was replaced in February 2021 after failure of the datalogger. The very low frequencies in the first

year seem to have been prevented to be recorded, potentially due to an issue with the digitizer. After February 2021, the mass position traces of YJ.2004 were not backed up. For YJ.2001, we suspect a levelling issue with the sensor, resulting in rapid out-of-range mass positions. A strong polynomial trend was present and removed in the first part of the trace in HHE components, which prevented retrieval of meaningful tilt data.

Figure S2: Example of desiccation-related fissuring observed at the Hollin Hill Landslide Observatory (HHLO). The photo shows a trench excavated into one of the larger surface fissures developed in the Whitby Mudstone Formation during an extended dry period. Moist soil was encountered from ~10 cm depth, while the

fissure itself remained open and could be traced to at least ~45 cm depth. Evidence suggests it continued deeper, but collapse of the friable material prevented further excavation. Such fissures illustrate the potential for significant shrink–swell deformation and the formation of deep, laterally extensive cracks in clay-rich slopes, which may influence moisture infiltration and subsequent landslide activity, and may also act as a source mechanism for local seismic activity during their formation (see Fig. 6 of the main manuscript).

References

Wenner, M., Allstadt, K., Thelen, W., Lockhart, A., Hirschberg, J., McArdell, B.W. and Walter, F., 2022. Seismometer records of ground tilt induced by debris flows. *Bulletin of the Seismological Society of America*, *112*(5), pp.2376-2395.