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## Using seismic networks and satellite radars to detect landslide events

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Catalogues are the base to study the causes leading to slope failures and to define landslide hazard and early warning strategies at regional scales. Despite recent efforts, the knowledge on spatial and temporal landslide distribution is often very poor. Information on timing, location, magnitude and landslide dynamics, is generally available only when the events threaten life or damage infrastructures, as well as when they are associated with catastrophic earthquakes or exceptional meteorological occurrences. Moreover, many landslide events are unreported because they occur in remote regions and thus do not have immediate impacts on human activities. This may strongly hinder the completeness of landslide catalogues, and thus the subsequent interpretation in terms of hazard assessment. Complete catalogues are crucial to study the relationships between local and regional landslide preconditioning factors, to recognize potential triggers, as well as to clearly identify the effect of climate forcing. In recent years two procedures are dominating the panorama of landslide event detection, i.e. remote sensing approaches and seismic data analyses. This is mainly due to the increased availability of such data at global scale, as well as to the applied open access data policies. Here we present a procedure to detect landslide events by jointly analyzing data acquired from regional broadband seismic networks and spaceborne radar imagery. As an exemplary case, we consider a series of events associated to the recent Piz Cengalo rock slope failure occurred on August, 2017 in the Swiss Alps, a region where we can now benefit from the high spatial density of the AlpArray seismic network and from the spatial and temporal resolution of Sentinel-1 radar imagery. The operational implementation of the herein proposed approach, in combination with the expected increase in availability of seismic and satellite data, can provide a new and efficient solution to build and/or expand landslide catalogues based on quantitative and homogeneous measurements, as well as to integrate landslide early warning systems at regional scales.

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