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Utilizing web-based geodata for rapid disaster identification and assessment

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Developing methods to rapidly locate and quantify the impact of natural disasters can aid both the coordination of emergency response, and the long-term understanding of natural hazards in a range of environmental settings. Gaining such quantitative data in the aftermath of landslide events is particularly challenging, as the localized nature, steep terrain, and frequent damage to infrastructure caused by common triggering events (e.g. earthquakes, storms) complicates traditional methods of survey and data communication. As a result, the first, and often best overview of disastrous events is typically provided by eyewitness or first-responder photographs distributed through official, or social media networks. Although these images allow for an initial qualitative assessment of the event, their ad-hoc nature does not currently allow for either precise location, or quantitative evaluation of key event parameters (e.g. structural setting, geology, geometry, size, transport path, or total fall height).

Here we present two tools designed to facilitate initial location and assessment of key event parameters using a combination of freely available geodata and information derived from eyewitness observations. These tools are currently under development, and rely on the adaptation of existing photogrammetric techniques in order to allow users to rapidly map and quantify event parameters from a combination of ad-hoc media photographs, and existing orthophoto and digital terrain model data (e.g. LiDAR, SRTM, ASTER). By incorporating results in freely-available GIS platforms such as Google Earth, local authorities will be able to to better assess and disseminate information regarding the impact of natural disasters in the critical hours following an event. We expect that quantitative data derived from events will provide important information to allow geohazard researchers to better assess landslide generation, and authorities to better plan responses to future triggering events.