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“3D MAPPING AND MONITORING OF GEOHAZARDS: WHERE DO WE STAND?”

Geohazards comprise different types of environmental processes such as earthquakes, landslides, floods, avalanches, etc. threatening human living, economic wellbeing, and infrastructure. They may occur as single events, periodical or continuous processes, which can be spontaneously triggered, reactivated or accelerated with impacts on local or regional scale. 3D mapping approaches by sensing became an essential part in high-level monitoring of geohazards, enabling enhanced process understanding, risk analysis and planning of protection and mitigation measures. The ongoing development of sensors and platforms leads to reduced size and weight, by simultaneously increasing resolution and mobilisation of sensors for establishing enhanced monitoring applications in geohazard research.

To date, we can make use of a large variety of sensor platforms, from static to moving, from terrestrial to aerial, to space-borne collecting data in specific radiometric, spectral, spatial and temporal resolutions. 3D mapping approaches as topographic LiDAR and photogrammetry are used with increasing flexibility in different settings, such as unmanned laser scanning in combination with sensors in multispectral and hyperspectral domain, just as one example. Current research may focus on data integration from different sensors and data sources, up- and downscaling strategies, and ongoing automation in geodata collection, processing, analysis and interpretation. These research tasks go along with the current emerging fields of digitisation, autonomous mapping, robotics and artificial intelligence. Scientific achievements in these fields will further improve natural hazard management strategies and the development of resilient societies against geohazards.