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Can landslides provide geosystem services?

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The concepts of biodiversity and ecosystem services, focusing on the diversity of life and the services provided to humans by such diversity, in interaction with abiotic ecosystem components, are well established. Only recently, geosciences have started to challenge this rather biocentric view by highlighting that geodiversity – understood as the diversity of minerals, rocks, geological structures, soils, landforms, and hydrological conditions – provides substantial services to society and should be treated as equal partner to biodiversity. It was proposed to use the more general term natural services or, where geodiversity is much more relevant than biodiversity, geosystem services. Even though the term geosystem services is more and more employed in literature, it evolves only slowly into a commonly used concept with a clearly defined meaning. Interpretations range from all services associated with geodiversity which are independent of interactions with biotic nature, to the restriction to subsurface services. None or few of these concepts, however, include risks as negative services, or as costs of services, which is surprising as this would enable a more integrated vision on human-nature relationships. Only very recently, the potential of geosystem service maps to highlight both services and risks related to geomorphological processes was pointed out.

This work picks up landslides as a type of geomorphological process and landform, which is rather negatively connotated in society and associated with risks rather than with chances. We use landslides to develop a broader understanding of geosystem services, together with the common understanding of hazards and risks. We will (i) present a sound and integrated conceptual framework to consider landslides within the field of tension between risks and resources, and (ii) highlight a case study where landslides are used as cultural geosystem services for environmental education in the context of UNESCO Global Geoparks, which are considered important instruments for conserving and promoting geodiversity.