



Artificial Intelligence-Assisted Landslide Hazard Mapping incorporating the European Union's INSPIRE Mapping Standards

Gioachino Roberti, Clinton Smyth, and David Poole

Minerva Intelligence Inc, Geospatial Technology, Canada (groberti@minervaintelligence.com)

Climate warming is changing weather patterns and affecting the frequency and magnitude of landslides. At the same time the global population and the number of people exposed to landslide risk is increasing. Consequently, there is a need for better landslide hazard and risk understanding both by technical experts and by the non-technical segments of society at large.

Recent advances in artificial intelligence (AI) can contribute to this understanding by producing landslide hazard and risk maps which can explain themselves, as has been demonstrated in a landslide hazard mapping study in British Columbia.

The study makes use of standardized earth science taxonomies, ontologies and linked data, including the EU's INSPIRE standards where possible. Polygons are described by semantic networks incorporating data on bedrock lithology, surficial materials, land use classification, slope parameters (slope, aspect) and precipitation data. These descriptions can then be used with matching technology to determine similarity rankings to 32 globally recognised landslide types which have also been expressed in semantic networks using the same terminological standards. The results are delivered within an internet mapping environment which allows the viewer to interrogate individual hazard or risk polygons.

By applying EU science language standards to a global landslide classification system and to landslide hazard mapping in Canada, the study demonstrates the positive role standards play in achieving international scientific interoperability. Further, the study illustrates how AI technologies can be designed to explain themselves, and hence contribute to human understanding of complex problems such as landslides.