Earth Observation

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Can we spot glacier surge events in global digital elevation data?

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Glacier surges events are characterised by long periods (decades) of inactivity punctuated by short periods (months to years) of extreme ice discharge. They are confined to specific regions of the world (e.g. the Karakoram, Pakistan; Alaska; Svalbard) and can impact on mountain communities by triggering avalanche and flood events as the ice advances down-valley. Although frequently unreported, they can be effectively detected using digital elevation data, because the rapid transfer of mass through the glacier system results in dramatic elevation changes being recorded in time-separated DEMs. With global analyses of glacier surface elevation change now routinely available, there is an opportunity to build a long-term (20+ years) record of previous surge activity in a semi-automated fashion. This project will use recently published glacier surface elevation datasets alongside an existing processing pipeline to identify and then characterise surge events for a discrete region of the world. The successful student will have a desire to gain experience with big data processing as well as Google Earth Engine, and there is potential for the resulting analyses to contribute to existing publication plans on characterising glacier surge events in different regions of the world.