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New technique proves effective for landslide early warning

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Florian Schläfli (left) and Dr. Adrian Wicki install in situ soil wetness sensors to validate the satur

Florian Schläfli (left) and Dr. Adrian Wicki install in situ soil wetness sensors to validate the saturation values derived from electrical resistivity tomography. Photo by Stefan Boss.

In mountainous regions worldwide, various early warning systems alert residents to landslides. In the case of rainfall-induced shallow landslides, scientists rely on soil moisture measurements to identify the wetness conditions that could trigger the events.

In a recent article in *Vadose Zone Journal*, a research team assessed electrical resistivity tomography (ERT) as a tool for detecting these conditions. The researchers installed ERT monitoring systems on a landslide-prone hillslope in Switzerland and then monitored water infiltration from precipitation and snow melt over nine months.

The researchers were able to reliably measure seasonal and event-scale saturation variation as well as critical infiltration properties commonly used in landslide early

warning and quantified the spatial variation of these properties. They also found that faulty measurements increased during highly saturated conditions, an issue that should be addressed in future applications.

The study demonstrates that ERT may be used effectively for early warning of landslides, especially in scenarios where it's important to understand how infiltration varies across slopes or where a non-invasive monitoring technique is required. In such scenarios, ERT offers clear advantages over the commonly used soil moisture sensors.

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Wicki, A., & Hauck, C. (2022). Monitoring critically saturated conditions for shallow landslide occurrence using electrical resistivity tomography. *Vadose Zone Journal* , e20204. **https://doi.org/10.1002/vzj2.20204**

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