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## Landslides on the radar: detection, monitoring, and runout hazard forecasting

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Landslides annually cause thousands of casualties and billions of dollars in property loss. Mitigation of their hazards demands answers to three fundamental questions: where are the landslides, how are they evolving, and what damages would they cause upon a runout failure? Radar remote sensing, capable of capturing landslide deformation in near real-time, proves itself an effective and efficient tool to help address these challenges. Here, we highlight a workflow that incorporates SAR (Synthetic Aperture Radar)'s unique values to aid landslide detection, monitoring, and runout damage forecasting. By integrating field instrumentation and hydromechanical modeling, our recent studies over the U.S. West Coast substantiated SAR's powerful capabilities: (1) Discovering approximately 600 destabilized, slow-moving landslides that were missing from the currently existing, non-systematically mapped landslide database of the United States; (2) Monitoring and characterizing spatiotemporal dynamics of landslides that destroy highways (e.g., the Hooskanaden landslide in southwestern Oregon), damage aquatic habitats (e.g., tens of irrigation-induced landslides in eastern Washington), and endanger communities (e.g., the Cascade Locks landslide in southern Washington); (3) Constraining source volume to help predict runout hazard of landslides that threaten popular campgrounds (e.g., the Gold Basin landslide in central Washington) and urban communities (e.g., the Cape Meares landslide in northwestern Oregon). Adaptation of our methodology to assimilate SAR observations could prove useful for mitigating similar landslide hazards beyond the regional scale.