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Nat. Hazards Earth Syst. Sci., 10, 2031-2038, 2010

www.nat-hazards-earth-syst-sci.net/10/2031/2010/

doi: 10.5194/nhess-10-2031-2010

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Design and installation of a Prototype Geohazard Monitoring System near Machu Picchu, Peru

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Abstract. The town of Machu Picchu, Peru, serves the >700 000 visiting Machu Picchu annually. It has grown threefold in population past two decades. Due to the limited low-lying ground, construction occurring on the unstable valley slopes. Slopes range from <10° on valley floor to >70° in the surrounding mountains. The town has a delta formed at the confluence of the Alcamayo, Aguas Calientes Vilcanota Rivers. Geohazards in and around the town of particular concern are 1) large rocks falling onto the town and/or the rail line, 2) flash floods by any one of its three rivers, and 3) mudflows and landslides. A preliminary warning system that could monitor weather, river flow and slope stability was installed along the Aguas Calientes River in 2009. This system is a distributed modular construction allowing components to be installed, maintained, salvaged, and repaired by local technicians. A diverse range of candidate power, communication and sensor technologies was evaluated. Most of the technologies had never been deployed in similar terrain, altitude or weather. The successful deployment of the prototype proves that it is technically feasible to develop early warning capacity in the

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Citation: Bulmer, M. H. and Farquhar, T.: Design and installation of Prototype Geohazard Monitoring System near Machu Picchu, Peru, *Natural Hazards and Earth System Science*, 10, 2031-2038, doi:10.5194/nhess-10-2031-2010, 2010. [Bibtex](#) [EndNote](#) [Reference Manager](#) [XML](#)