motion generally took place following times of low atmospheric pressure, with a lag time of about three hours, whereas the landslide remained static following phases of high atmospheric pressure. The pressure fluctuations and corresponding landslide activity recurred at 12- and 24-hour intervals, suggesting that atmospheric tides are driving the motion of the landslide.

The motion data indicate that the Slumgullion slide teeters around criticality. Under such conditions, it is not unreasonable to expect that very small fluctuations in the state of stress near the landslide base will suffice to induce failure[6,7]. Nevertheless, changes of the order of 0.5 kPa in air pressure, with respect to a mean of about 69–70kPa, are far too small to induce a significant change in normal stress under the 25–35 m of soil and rock debris that cover the slip surface.

Schulz and colleagues propose a solution to this dilemma: the drop in air pressure acts to pull the air and water in the pores and spaces in the landslide material towards the surface. The upward (surface-normal) motion of the water induces viscous drag throughout the soil matrix, generating an upwards-directed force that reduces the normal stress on the slip surface below. For a landslide at the cusp of failure, these reductions in normal stress are sufficient, they suggest, to reduce friction enough to initiate sliding.

The idea is provocative, because the forcing required to trigger landslides is invariably assumed to be very large; the fact that most hillslopes do not fail after a light shower or as a storm approaches is ample evidence for this assumption. However, several factors may conspire to make the Slumgullion landslide prone to this unusual forcing. One of the principal factors is the effect of elevation: atmospheric tides are stronger at the high altitude of Slumgullion (~3,000 m) than at sea level, which means that tidal pressure variations are much larger. Furthermore, it is likely that factors such as the history of landslide failure, its large scale and its material properties have contributed to bringing the sliding mass so close to the cusp of failure.

It is unlikely that Slumgullion is unique, and it will be interesting to see if other slow-moving failures show a similar dependence on atmospheric tides. It seems unlikely that weak forcing like this will apply to the kinds of spectacular landslides that fail at great speed on steep slopes. However, the work by Schulz and colleagues[1] raises an intriguing question about typhoons: perhaps heavy rainfall is not the only slope-destabilizing effect of an incoming storm. ❐

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Correction

In the Commentary 'CO_2 emissions from forest loss' (*Nature Geosci.* **2,** 737–738; 2009), in Fig. 1 the top solid brown line should have been a dashed brown line. This error was corrected online in the HTML and PDF versions on 15 November 2009.