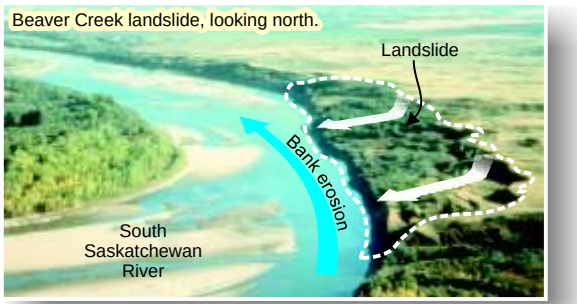
THE TROUBLE WITH VALLEY SLOPES: LANDSLIDES

Aerial view of Saskatoon, looking south, with sites of historical landslides.

Tourism Saskatoon

Valley slopes throughout southern Saskatchewan are prone to landslides. Most of the landslides move slowly, millimetres or centimetres per day, but even slow movement is very damaging to roads, houses, and other structures. Landslides are particularly common in the South Saskatchewan River valley where, over time, the river has eroded its banks, forming steep valley slopes.

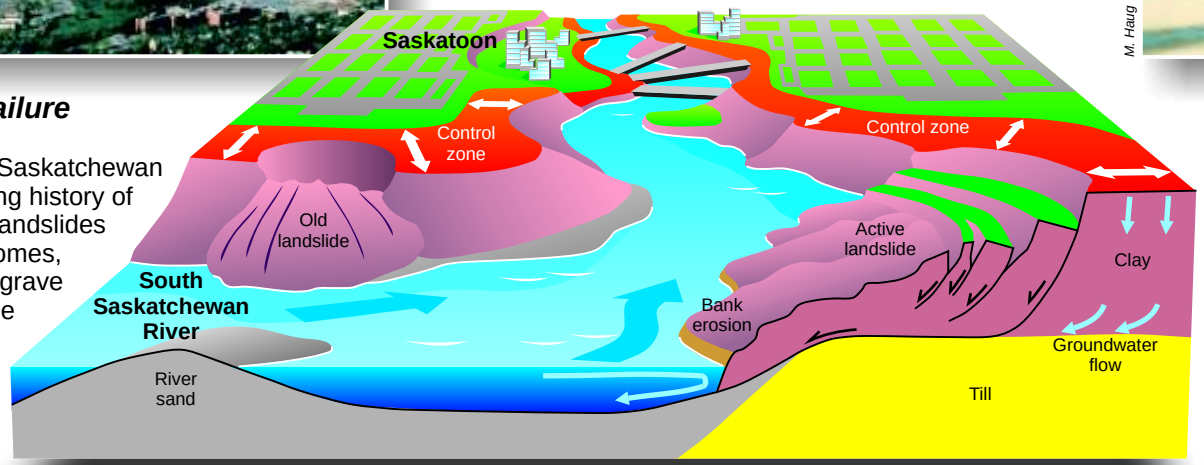


Beaver Creek landslide, looking north.

M. Haug

A history of failure

The east bank of the South Saskatchewan River in Saskatoon has a long history of landslides. Over the years, landslides have threatened riverside homes, roads, streetcar tracks, and grave sites. This hazard has led the municipal government to establish a control zone along the riverbanks, where building is not permitted.



Collapsing riverbanks

The Beaver Creek landslide, which is located on the South Saskatchewan River 13 km south of Saskatoon, has expanded eastward 40 m since 1944. Movement is greatest during spring snowmelt and early summer rainstorms, when high groundwater levels lubricate the slide.

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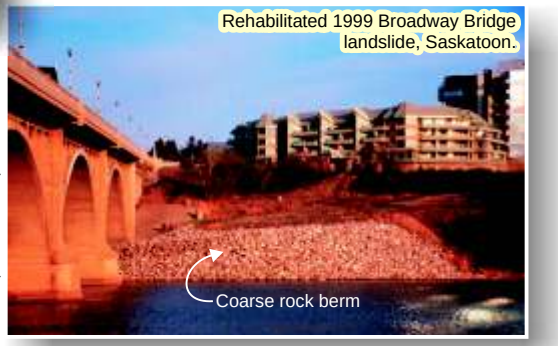
Recipe for trouble!

What conditions favour a landslide? Here's the recipe — start with the natural pull of gravity, add some riverbank erosion to ensure the slope is steep, make sure the slope materials include soft clay, add groundwater to lubricate the slide, and presto, a landslide!

Engineering a solution

In 1999, walkers on the Meewasin Trail noticed cracks in the soil beside the Broadway Bridge over the South Saskatchewan River in Saskatoon. Within a week, the land had moved several metres. The cause of the landslide was a plugged and leaking underground water drain that elevated water pressures in the slope materials. To stabilize the landslide, the underground drain was repaired, and a berm of coarse rock was placed along the river edge to hold the slope in place and prevent bank erosion.



Rehabilitated 1999 Broadway Bridge landslide, Saskatoon.

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