Supplement

Groundwater fluctuations during a debris flow event in Western Norway – triggered by rain and snowmelt

Bondevik and Sorteberg

Contents

Air temperatures recorded at the weather station at Anestølen in 2013 (Fig. S1)

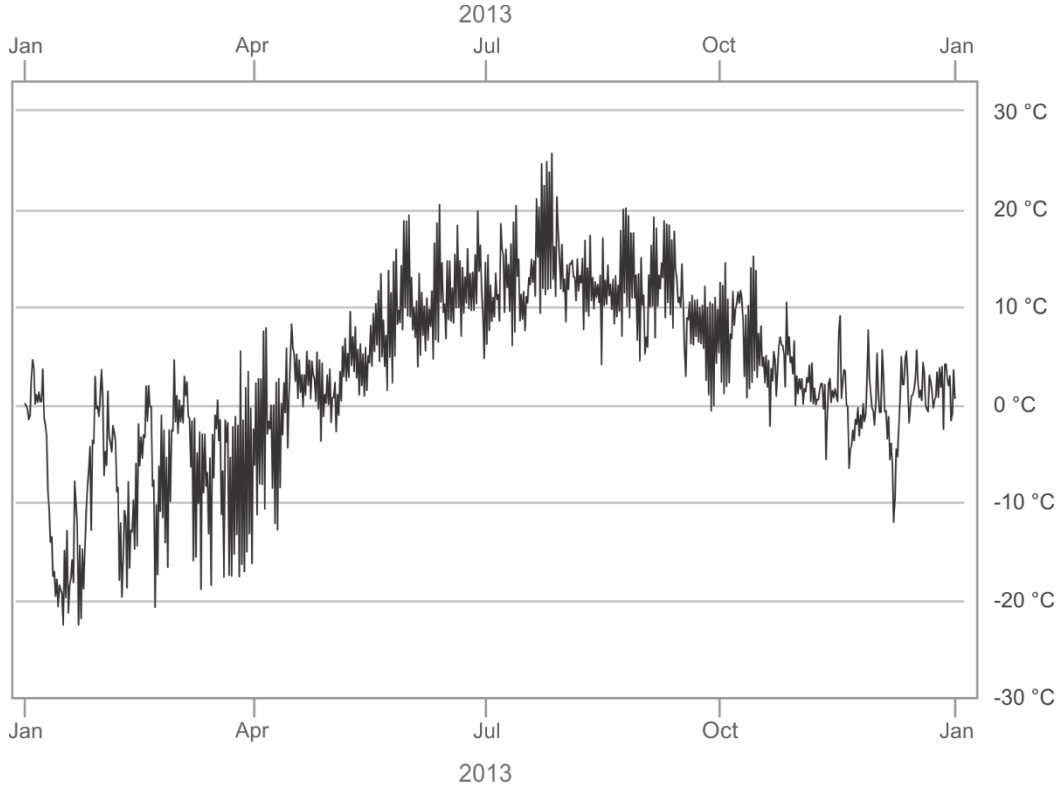

Figure S1: Air temperature measured at the weather station 77.24.0. Data downloaded from http://sildre.nve.no.

Photos of the debris flow in 2013 at Anestølen (Figs. S2-S5)

Figure S2: The debris flow deposits covered the road and continued into the lake. Photographed in the morning of 16 November 2013 by Vidar Leirdal.

Figure S3: The debris flow photographed in the morning of 16 November 2013 by Vidar Leirdal.

Figure S4: The debris flow photographed in the morning of 17 November 2013 by Stein Bondevik.

Figure S5: The debris flow ended in the lake and built out a delta. Photographed in the morning of 17 November 2013 by Stein Bondevik.

Groundwater fluctuations, groundwater temperatures and precipitation in 2012 (Fig. S6)

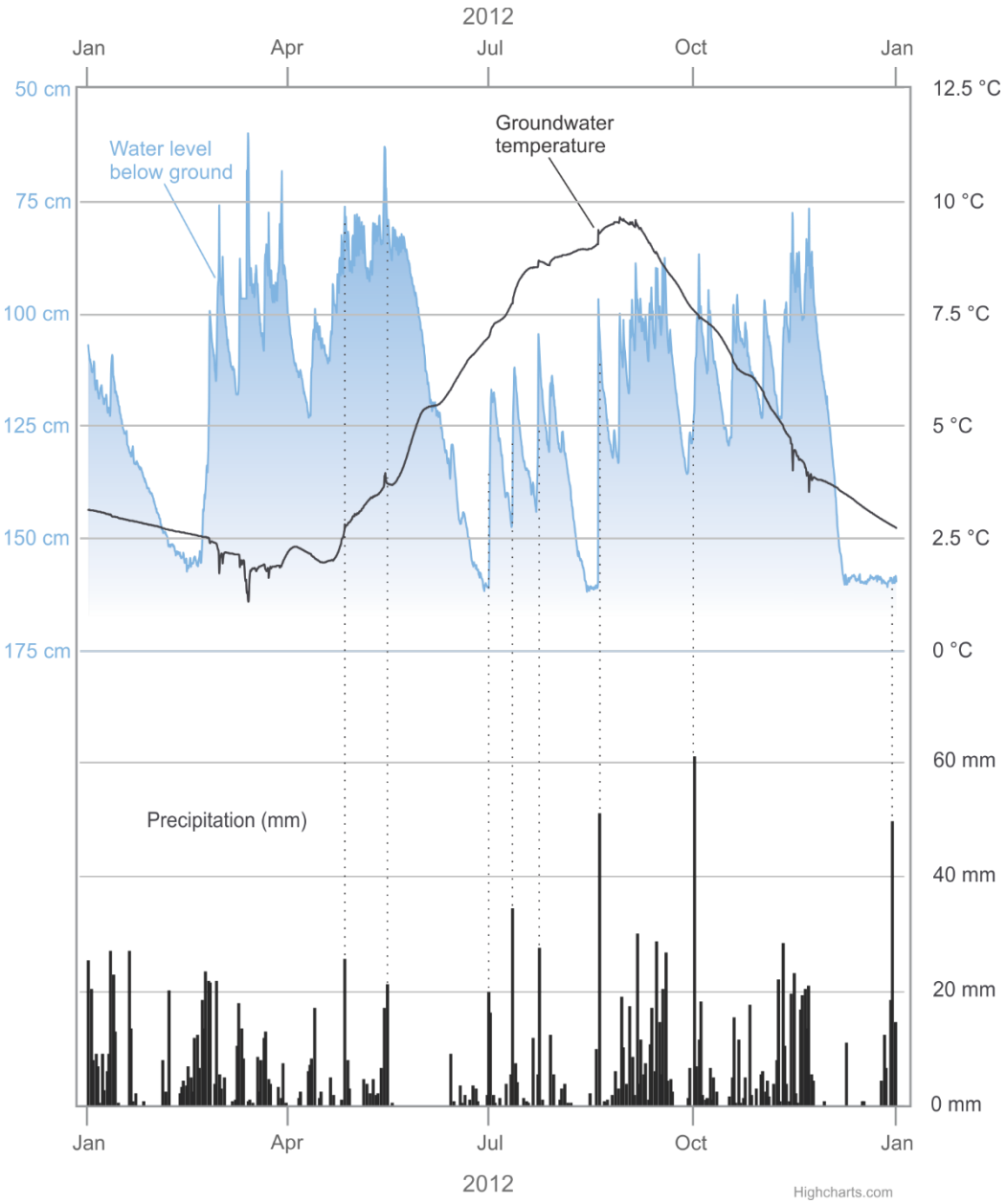

Figure S6: The upper diagram shows groundwater level (blue curve) and groundwater temperature (black curve) from the borehole on the slope in 2012. The lower diagram shows 24h precipitation at the weather station at Selseng, station no. 55700, http://eklima.met.no.

Groundwater fluctuations, groundwater temperatures and precipitation in 2011 (Fig. S7)

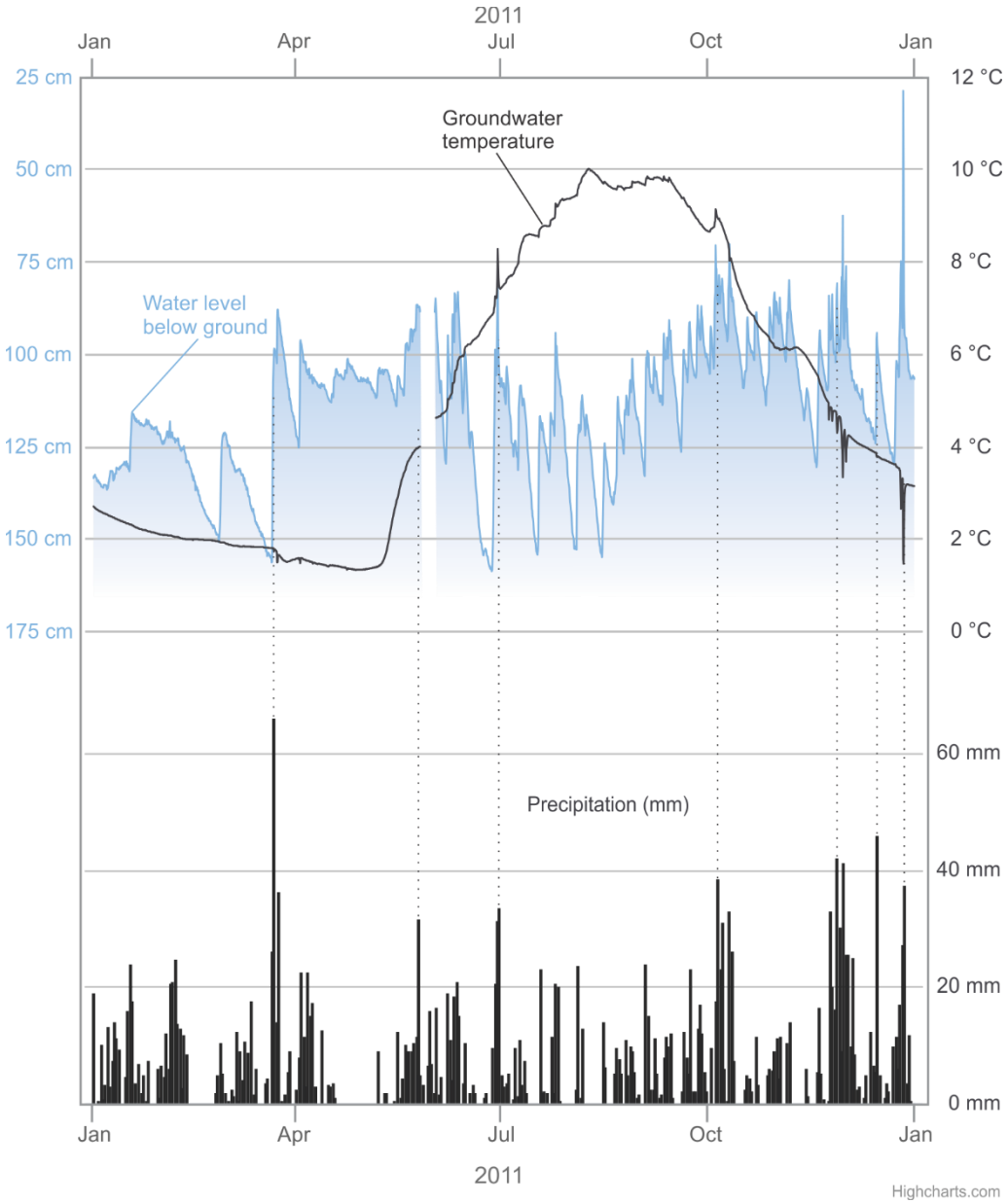

Figure S7: The upper diagram shows groundwater level (blue curve) and groundwater temperature (black curve) from the borehole on the slope in 2011. The lower diagram shows 24h precipitation at the weather station at Selseng, station no. 55700, http://eklima.met.no. The most pronounced peak is on 26 December, when groundwater reached 28 cm during storm Dagmar. No data between 26 May and 1 June.

Groundwater fluctuations, groundwater temperatures and precipitation in 2010 (Fig. S8)

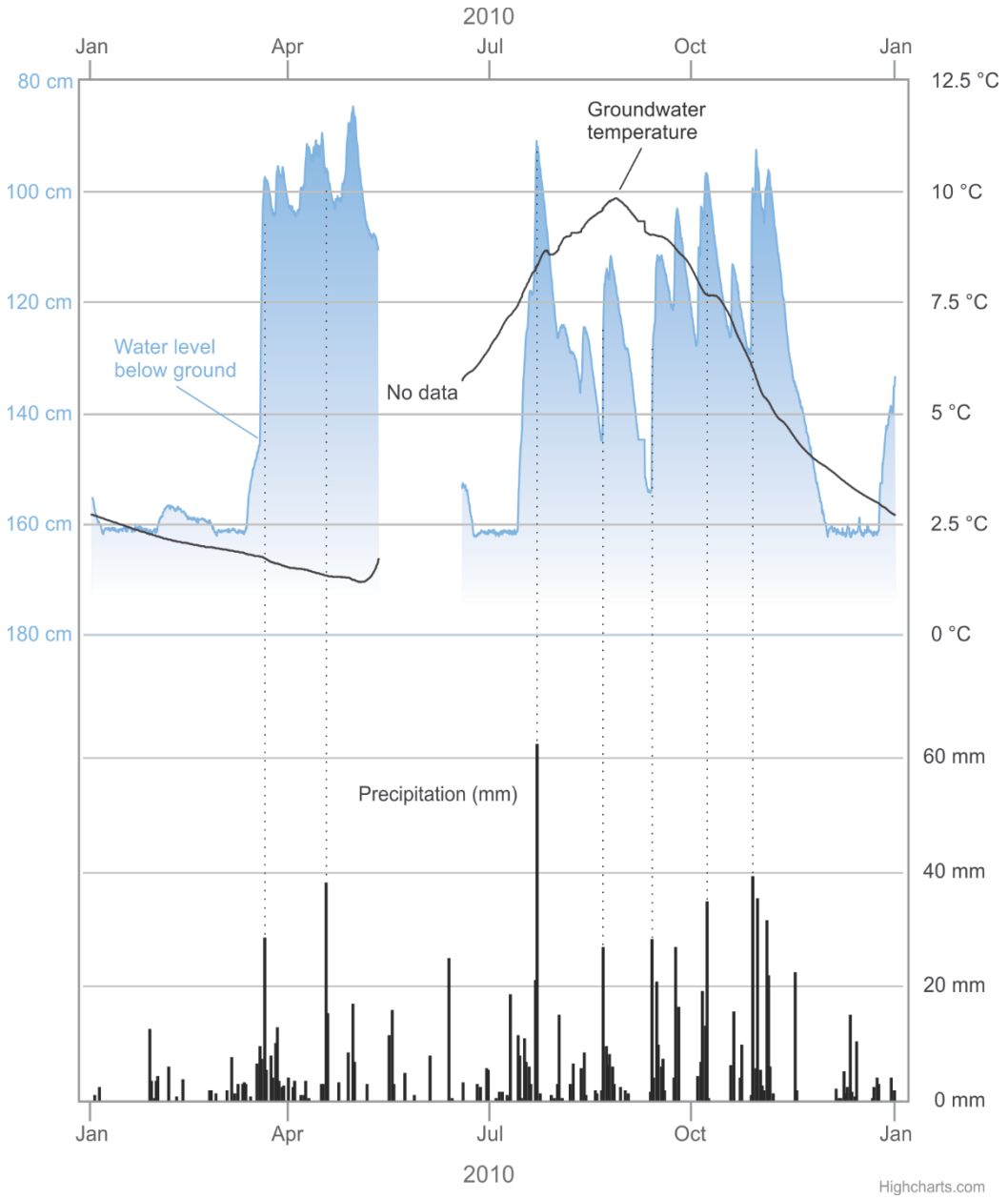

Figure S8: The upper diagram shows groundwater level (blue curve) and groundwater temperature (black curve) from the borehole on the slope in 2010. The lower diagram shows 24h precipitation at the weather station at Selseng, station no. 55700, http://eklima.met.no. No data between 11 May and 17 June.

Snow at the weather station at Anestølen in 2013 (Fig. S9)

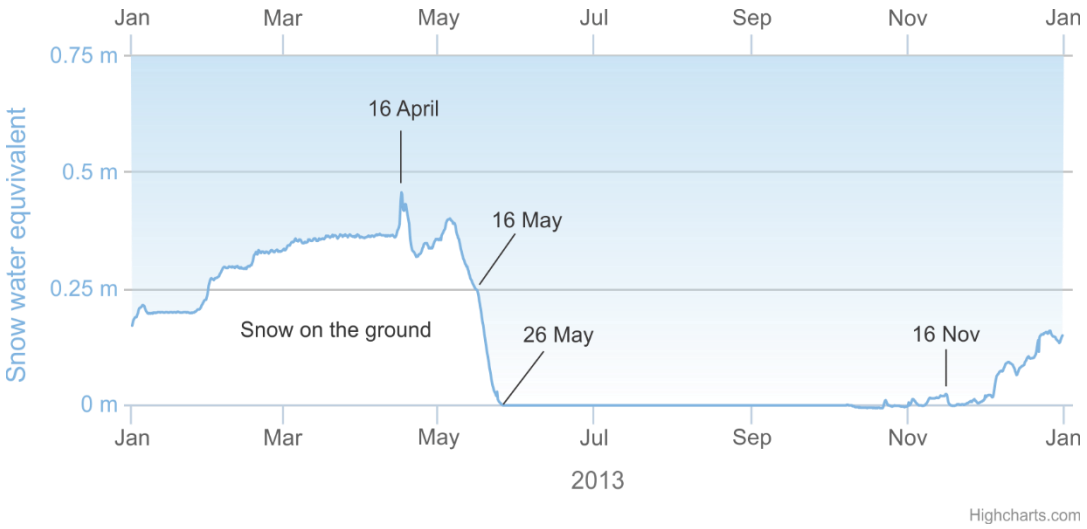

Figure S9: Snow water equivalent measured at the weather station 77.24.0 using a snow pillow. Snow water equivalent is the amount of water stored in the snow pack. There was a little snow on the ground on 16 November (24 mm of water).

Rates of change of groundwater level in 2012 (Fig. S10)

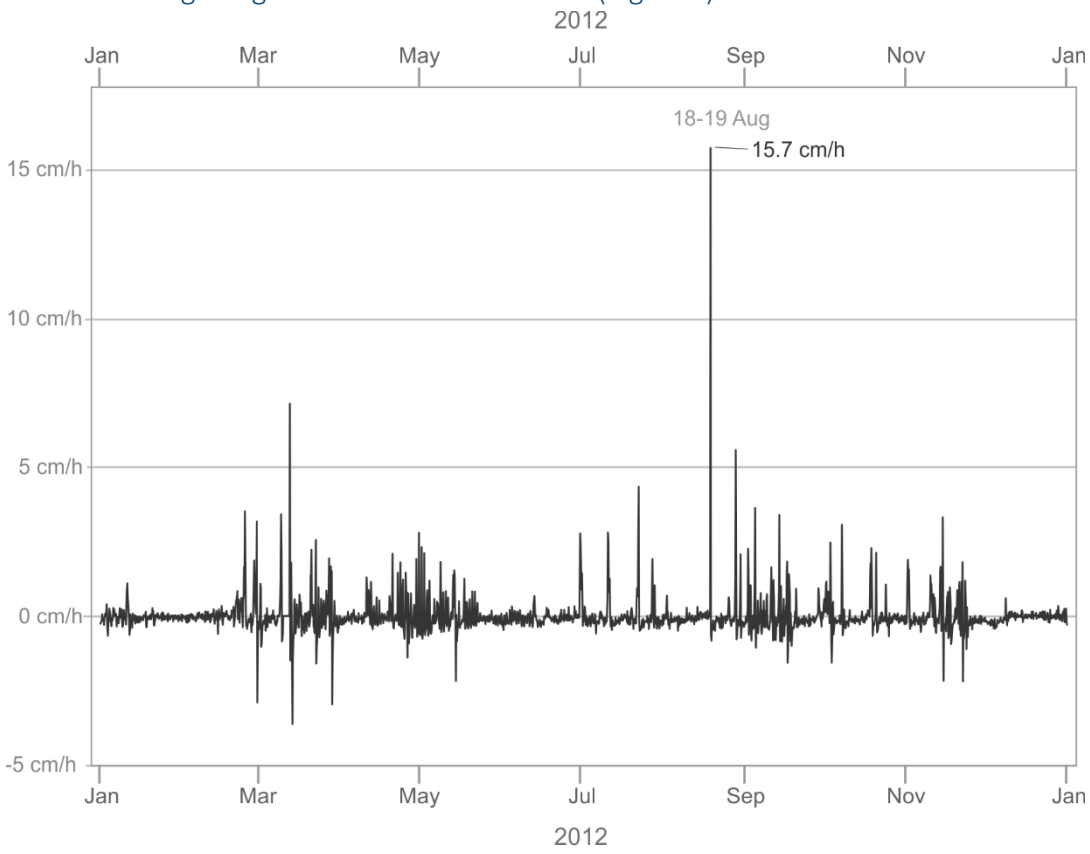

Figure S10: Rates of change of groundwater level in 2012. The largest recorded rate was on 18–19 August, 15.7 cm/h.

Rates of change of groundwater level in 2011 (Fig. S11)

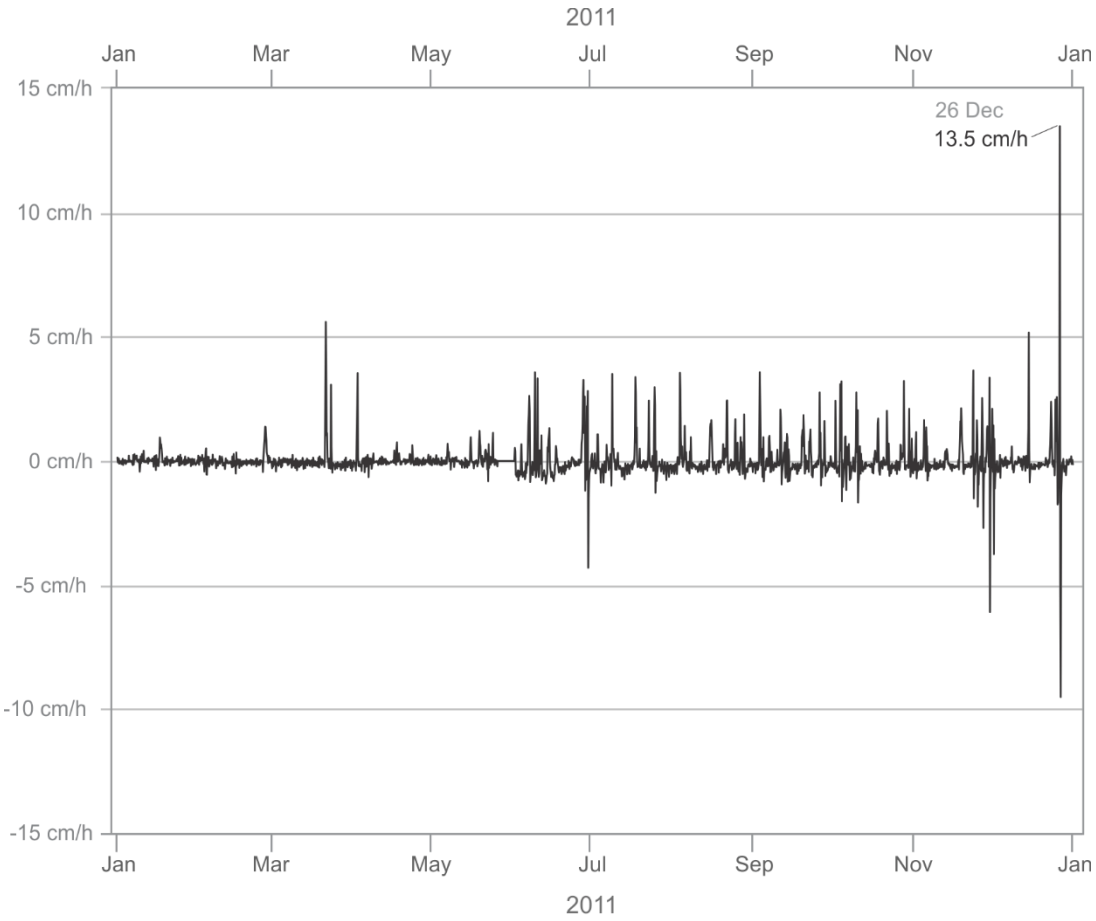

Figure S11. Rates of change of groundwater level in 2011. The highest rate this year was 13.5 cm/h recorded during storm Dagmar on 26 December.

Rates of change of groundwater level in 2010 (Fig. S12)

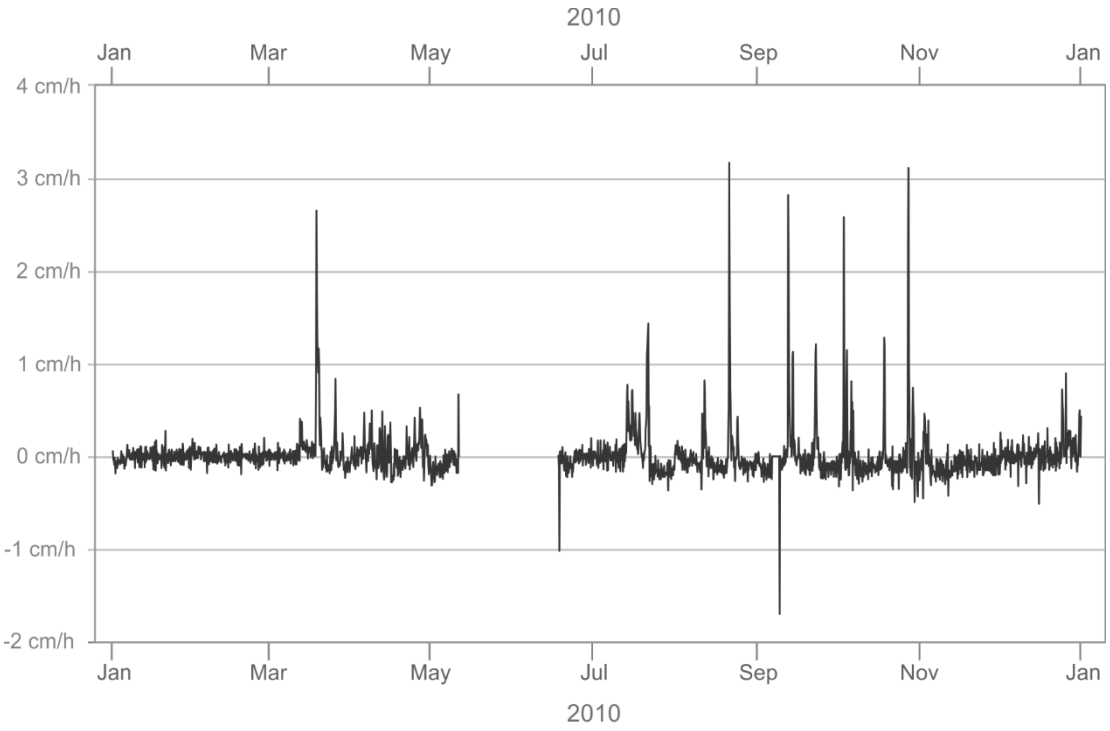

Figure S12: Rates of change of groundwater level in 2010. The highest rate recorded was 3.2 cm/h.